



TRAILBLAZERS

MAPPING THE JOURNEY OF
YOUNG BIOENTREPRENEURS



The National Academy of Sciences, India

in Association with

Biotech Consortium India Limited

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प्रो. अनिल काकोडकर

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MESSAGE



Prof. Anil Kakodkar

Science and Technology based entrepreneurship particularly among the youth of our country is the key to higher level employment generation and wealth creation in the new age India. National Academy of Sciences, India (NASI) considers it critical to India's growth and development in the contemporary and competitive world. Entrepreneurship is an important determinant for achieving sustainable and inclusive growth, and has significant potential for creating further jobs beyond self-employment.

The Government of India has initiated several policies, programmes, funds and incubators to foster entrepreneurship which has lead to an encouraging atmosphere in the country for innovations.

I am delighted the NASI-New Initiatives Committee under the Chairpersonship of our former President Prof. (Mrs.) Manju Sharma, is pursuing initiatives to promote entrepreneurship and skill development in the country. This book is part of such an effort by NASI to nurture the spirit of entrepreneurship and self-employment amongst students, research fellows, young faculty and scientists. NASI has organized several entrepreneurship development programmes in the past to encourage students and build a base for the young entrepreneurs to showcase their success stories.

This book highlights the dynamism in the field of biotechnology and celebrates the indomitable spirit of 65 young bio-entrepreneurs who are changing the status quo of biotechnology in the country. Filled with real learning from the trenches of start-ups and small enterprises, this book would hopefully motivate prospective entrepreneurs and help them find valuable information for starting and building their own business in biotechnology.

The efforts of Biotech Consortium India Limited (BCIL), New Delhi in compilation of this book and personal experiences are commendable.

We aim to bring to the fore many more such initiatives for nurturing and mentoring potential entrepreneurs for setting up their own ventures.

With my good wishes to the entrepreneurs

(Anil Kakodkar)

FOREWORD



Dr. (Mrs.) Manju Sharma

Entrepreneurship has become increasingly important as the process of change accelerates in a rapidly globalizing economy. There are too few quality jobs to meet the aspiration of its growing workforce, leaving many people under-employed, poorly paid or outside the labour force. Also, large sections of the educated workforce have little or no job skills, making them mostly unemployable. Automation technology is eliminating jobs in nearly every industry at an ever increasing pace.

Most policymakers and academics agree that entrepreneurship is critical to the development and wellbeing of society. Entrepreneurs create jobs. They drive and shape innovation, thereby speeding up structural changes in the economy. To realize the triple dreams of 'Innovate in India', 'Startup India' and 'Make in India'

of the Government of India, there is a need to establish thriving innovation ecosystem by prioritizing product innovation and commercialization. Sustainable economic development and growth in India is expected to originate from indigenous innovations, technologies, products and services.

Biotechnology offers immense scope for strengthening economic growth through innovative technologies for mass multiplication/enhancing productivity of elite plant varieties, production of value added products, etc. However, utilization of biotechnology applications in commercial operations is presently negligible. There is an urgent need to encourage biotech entrepreneurship.

The National Academy of Sciences, India (NASI) is the oldest science academy in India. It nurtures the ideas and epitomise the creative instincts of the scientific community. NASI is keen to promote skill development in the country through programmes such as S&T entrepreneurship development and awareness and training programmes through NASI-New Initiatives Committee.

This book is part of an initiative by NASI to promote entrepreneurship and self-employment as a career pathway amongst students, research fellows, young faculty and scientists. It is a fact that biotechnology entrepreneurs in India face much greater challenge than their western counterparts, not just in terms of the lack of infrastructural support but also in terms of the lack of social support.

This book gives limelight to 65 young entrepreneurs working on biotechnology innovations such as biomedical devices, molecular therapeutics, nutrition, tissue culture, biofertilizers, specialty enzymes, among others. The success of these bioentrepreneurs will positively inspire the aspiring entrepreneurs and encourage them to pursue entrepreneurial dreams. In addition, the readers will be able to mine ideas and lessons from the entrepreneurial journey of the bioentrepreneurs who have shared their personal narratives with us.

This compilation would not have been possible without the support of Biotech Consortium India Limited (BCIL), New Delhi. We are indeed thankful to BCIL for the immense enthusiasm and hard work behind this publication. NASI is also grateful to all the young entrepreneurs who responded with tremendous enthusiasm in sharing their experiences for the book.

We hope that this book will help in nurturing a spirit of entrepreneurship amongst budding entrepreneurs in biotechnology.

Dr. (Mrs.) Manju Sharma

Former Secretary to the Govt. of India

Department of Biotechnology

Principal Advisor to the Dept. Science

and Technology, Gujarat

Distinguished Women Scientist Chair, NASI, Allahabad

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INTRODUCTION

Entrepreneurship is the most important driver of innovation, business growth and economic change. Entrepreneurs create jobs. Entrepreneurship is thus a catalyst for national economic growth and global competitiveness. There are very few quality jobs being added to the economy every year to meet the aspiration of its growing workforce, leaving many people under-employed, poorly paid or outside the labour force. Automation technology is eliminating jobs in nearly every industry at an ever increasing pace. Hence, entrepreneurship has become increasingly prominent in a rapidly globalizing economy.

Biotechnology has the power to provide solutions to myriad challenges that humanity deals with from climate change, disease burden, food & nutritional security, clean fuel to environmental degradation. The engine of bioeconomy is powered by the fuel of entrepreneurial energy- this can be seen in all major hubs of biotechnology across the world. India has commenced on a mission to achieve the target of becoming \$US 100 billion bioeconomy by 2025.

India's bioeconomy is concentrated on the following sectors - Biopharmaceuticals, Bioagriculture, Bioindustry and Bioservices.



Promotion of the bioentrepreneurship is high on the policy agenda of the Government of India. Biotechnology has been recognized as one of the key priority sectors under the 'Make in India', 'Skill India' and 'Startup India' initiatives of the Government of India, being one of the few sectors on strong growth trajectory to drive sustainable economic growth and generate large scale employment opportunities.



The DBT National Biotechnology Development Strategy 2015 – 2020 provides a strategic roadmap for India's emergence as a global biotechnology innovation and manufacturing hub and to contribute towards enterprise creation, innovation and economic growth.

The Government of India has initiated several policies, programmes, funds and incubators to foster entrepreneurship which has led to an encouraging atmosphere in the country for innovations.

Bioentrepreneurship can be described as creation of wealth from the application of the biosciences in the business context. India is in an advantageous position to harness the potential of bioentrepreneurship leveraging its unique strengths such as availability of rich bioresources, technical expertise, skilled manpower, expanding startup ecosystem, progressive government policies and access to

international markets. To achieve this, there is a need to promote creation of bioenterprises as well as strengthening existing bioenterprises.

Though biotechnology offers immense scope for strengthening economic growth through innovative technologies for healthcare, agriculture, environment and food processing; utilization of biotechnology applications in commercial operations is presently sub-optimal. Given this context, the National Academy of Sciences, India (NASI) is keen to encourage and promote self-employment in biotechnology as a career option for young people.

NASI is the oldest science academy in India. Its mission is to nurture the scientific temper and epitomize the creative instincts of the scientific community. NASI is keen to promote entrepreneurship in the country through initiatives such as entrepreneurship development programmes and publications under the aegis of NASI- New Initiatives. NASI in collaboration with Biotech Consortium India Limited (BCIL), a company promoted by the Department of Biotechnology and All India Financial Institutions, has organized several entrepreneurship development programmes in the past to encourage students and build a base for the young entrepreneurs to showcase their success stories.



NASI-BCIL Entrepreneurship Development Programme at Mohali



NASI-BCIL Entrepreneurship Development Programme at Lucknow



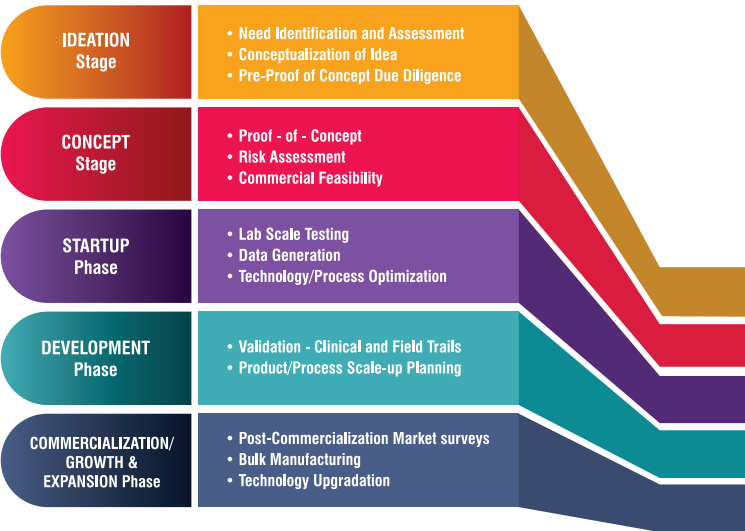
NASI-BCIL Entrepreneurship Development Programme at Chennai

Under the guidance of NASI, BCIL has come up with this book featuring the stories of 65 young entrepreneurs who are working on biotechnology innovations in the country.

The key objective of the book is to nurture the spirit of bioentrepreneurship and self-employment amongst prospective entrepreneurs. It is felt that the fear of unknown as well as unpredictable timelines in biotechnology product development deter the youth is pursuing business in biotechnology. The success of these bioentrepreneurs will positively inspire the aspiring entrepreneurs and encourage them to pursue entrepreneurial dreams. The book also aims to assist in spreading awareness about the process of entrepreneurship, entrepreneurial pathway to commercialization, enterprise and risk management and various entrepreneurial support mechanisms in the country.

Biotechnology ventures, in general, face a far more extended timeline for commercialization than many other high-tech industries. In the IT industry, software would be designed, developed and in the market within six to twelve-month period. However, in biotechnology, a typical drug development process takes 15–20 years with no guarantee of success. It is a fact that biotechnology entrepreneurs in India face much greater challenges than their western counterparts, not just in terms of the lack of infrastructural support but also in terms of the lack of social support.

Commercialization through bioentrepreneurship involves taking an idea to a successful outcome in the market, whether it is a product, service or process of biotechnology. The stages of commercialization initiate with identifying an idea, need assessment, proof-of-concept, development, validation, regulatory approval, commercial production and launch.



Entrepreneurs need to carry out detailed due diligence about why they want to pursue this path, what they hope to accomplish, and how their strengths and weaknesses may impact their efforts. Bioentrepreneurs featured in this book have focused on a problem statement – “opportunity niche” which is either too small or too new to have been noticed by established businesses and have shared their stories in identifying business opportunities in biotechnology.

Type of technology and availability of funding influences the choice of business model for a company. Biotechnology product/process development is an expensive process and access to capital is a massive constraint. Based on the stories of the bioentrepreneurs, only few startups and small enterprises are engaged in the full value chain of product development from research and development to marketing. Majority of them are leveraging hybrid business models to exploit a small or specialised niche in the market. The enterprises collaborate for access to a wide variety of skills and complementary assets such as manufacturing, sales and marketing infrastructure and distribution that are vital to the development and commercialisation of their own innovation, or they provide know-how and services that other firms are reliant on.

Entrepreneurs are often hesitant to take on innovative ideas because of the risks involved, including high investment and low availability of funds that often arrive late. Entrepreneurial projects need to cross 'Valley of Death' before attracting startup funding or development partners. As a result, they look for minimum risk and quick returns. The potentially higher returns from innovation take time to realize and very few bioentrepreneurs are willing to accept the risks.

The environment is tough. How do biotechnology ventures choose the best strategy? Which business models work best? There are no easy answers or good data to help make these decisions.

Such strategic issues faced by startups and small enterprises in biotechnology have been covered in the book. Each profile is well-structured detailing the entrepreneurial journey with personal narratives as well as their motivation to pursue entrepreneurship, identification of business opportunity and problems they faced in the process, how they overcame them and success tips for aspiring entrepreneurs. Bioentrepreneurs have also shared wisdom from their entrepreneurial journey

including right moves to make, pitfalls to avoid and relevant advice for budding entrepreneurs. Readers will be able to mine ideas and lessons from the entrepreneurial journey of the bioentrepreneurs who have shared their personal narratives.

BCIL has elicited information from startups and small enterprises which are in different stages of commercialization i.e. enterprises which are still in the process of product development – stage of pre-commercialization to enterprises with products in the market – stage of post-commercialization. The startups and small enterprises have been grouped together depending upon the area of portfolio and stage of commercialization.



Prospective entrepreneurs may discover that these young bioentrepreneurs are working on plethora of biotechnology products and services such as –

Biopharmaceuticals - Drugs, vaccines, therapeutics, devices, diagnostics, biomedical instrumentation
Bioagriculture - Tissue cultured plants, biofertilizers, biopesticides, agro-based products, animal nutrition
Bioindustry - Biofuels, specialty chemicals, industrial enzymes, nutraceuticals, cosmeceuticals, decontamination products
Bioservices - Customized molecular biology products like cell lines and antibodies, bioinformatics, contract manufacturing

We hope that the book acts as a catalyst for budding entrepreneurs, promotes dissemination of bio-based ideas, innovations and also encourages collaborations and connections among all stakeholders including Government departments, technology developers, manufacturers, clinicians, academics, investors, procurement officers and general public.

POST- COMMERCIALIZATION

Startups with Product/Services
in the Market

IDEATION

DEVELOPMENT

COMMERCIALIZATION





BIO

PHARMACEUTICALS



Axio Biosolutions Pvt. Ltd.

Founder: Leo Mavely

Year of Establishment: 2008

Location: Ahmedabad, Gujarat

Annual Turnover: Rs. 1 crore (average)

Team Members: 50

Area: Molecular Therapeutics



Academic Background

Leo is B.Tech in applied biotechnology (bioengineering) from Maharishi Dayanand University, Rohtak and has Advanced Diploma in managing technology ventures from Nirmalabs, Ahmedabad

Motivation to Pursue Entrepreneurship

I always believed in indigenous development of novel healthcare products using biotechnology. While looking at this space in India, I found that advanced woundcare is quite nascent and opportunities to build a world-class brand product brand are abundant. I took a chance during my college days to pursue it and here I am



Identification of Business Opportunity

An incident triggered my idea for Axio. It was in 2006, when I witnessed a road accident. A bus had hit a motorbike commuter. He was bleeding profusely and I felt helpless, there was nothing I could do to stop it. Luckily I was able to take him to the hospital in time and the victim survived. I started wondering why such a basic need of a product that would stop high pressure bleeding is not yet addressed. I did some research, and was unable to find a product in India that stopped such bleeding. So I started looking at projects at a tech incubator, I wanted to develop a product that can immediately stop bleeding and give the patient few more hours of a chance to survive. I was working on biopolymer-based devices during my college degree and decided to pursue the search for the perfect product for a haemostat



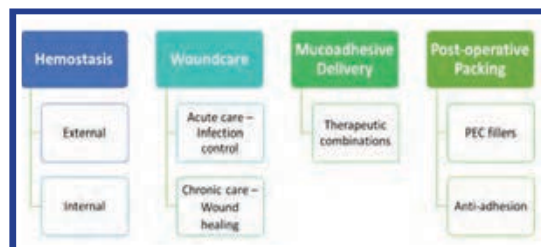
Portfolio

Axio's flagship product Axiostat is a sponge like dressing that stops bleeding within just 2-3 mins. It is made utilising a novel biomaterial platform. This is based on 100% chitosan technology that works on charge interactions between negatively charged blood components and positively charged Axiostat. The moment Axiostat is applied to an open wound, it reacts with the blood and becomes a very sticky substance that clots blood and stops bleeding. Axiostat can be kept on the wound for 24 hours. It absorbs the water to become a gel like substance that can be easily peeled off. Axiostat is currently used in four segments- Emergency, Military, Cardiovascular and Dental



Commercialization Strategy

Axio products are currently being widely used by military, hospitals, ambulance services, industries and relief aid. AxioStat Military is currently used by defence forces, paramilitary forces and army across India. It is the de-facto product of Indian armed forces and has been proudly part of all recent operations. AxioStat is also exported to 12 countries in Middle East, Africa and Europe. In coming years, we expect AxioStat to be the gold standard to stop any type of bleeding. AxioStat is currently awaiting USFDA clearance. On approval, AxioStat will be the first hemostat from India to get USFDA clearance. We have expanded our manufacturing capacity to approximate 1 million units annually, which makes it one of the largest of its kind in the world



Products in the Pipeline

Axio envisages a future where contemporary knowledge of biomaterials, medicine and engineering will be integrated in designing novel solutions to address the huge unmet need in management of trauma and chronic-infectious wounds

Mentors

I was fortunate to have smart and well-meaning people to guide and more importantly support me in all endeavours right from the beginning. Dr Amit Asthana (currently Principal Scientist-CCMB) who used to be my professor in college encouraged me to consider becoming an entrepreneur. Dr Madhu Mehta and Mr Thyagrajan Iyer (Founders- icreate, Ahmedabad) were the pillars of support during early days of Axio

Critical Areas for Mentorship

Ideal mentor is a good sounding board. As an entrepreneur you need few people whose opinion you can trust. I think mentorship is more about trust and support than giving specific inputs. Mentorship for a) finding the right product-market fit b) how to hire and retain top talent and c) tracking the right metrics for growth

Funding Mobilized

Funds via grants and loans for clinical trials from DST and venture capital investors: a) Accel Partners b) IDG Ventures India and c) GVFL- Gujarat Venture Finance Limited

Achievements

Our biggest success was when we landed the Indian Armed Forces (IAF) as a customer. A lot of people discouraged us saying IAF don't purchase Indian products or those manufactured by startups. But now, we are one of few startups who sell to them. It gave us a lot of confidence and reputation because a product that can work with the Indian armed forces, in the field, gave confidence to doctors as well. AxioStat has been granted patent by Indian Patent Office. We have also won the following awards:

- Fortune India 40 under 40, 2017
- Winner: Good Samaritan Awards, 2016





- Winner: Bioasia Best Emerging Startups, 2016
- Winner: Silicon Valley Challenge Fellow, 2014
- Winner: Anjali Mashelkar Inclusive Innovation Award, 2013
- Special Jury Award: IMC Inclusive Innovation Award, 2013
- Winner: CNBC Samsung Social Innovation Quotient Award, 2012

Entrepreneurial Journey - Nutshell

The journey as an entrepreneur comes with ups and downs. But it has been exciting. The mission keeps us awake. Hearing stories from our users on how our product, Axiostat has saved lives, is the most rewarding part of this journey. Entrepreneurship comes with a lot of uncertainty, but it also comes with tremendous responsibility and accountability. In my case, there was an unmet supply for a product that would help millions, and I couldn't wait to jump in and be a part of that change. Today, 90% of our sales are from the Indian Army. Knowing that we are able to help the nation, it is a huge moment of pride and a milestone for Axio

Lessons from the Journey

While most startups face funding as a major challenge, I am grateful that it has not been too challenging for us. It was more difficult to find a way through the regulatory network. In India, there were no clear medical device regulations, which one can follow. So we were forced to look at US FDA and European Union regulations and comply with that and hope that Indian authorities will accept it. This big lack of clarity in terms of approval and absence of an authority to guide us were major challenges back then when we started in 2008. The situation has definitely improved quite a bit now from that time. Another challenge was the perception of India as a brand. When we go abroad or even in Indian markets, the doctors always look up to products developed outside. This perception is changing slowly, but when we deal with life-saving products, it is always important to build out a brand. That's one reason we have spent quite a bit of time and money in building clinical endorsements. I must admit it would have been much easier if we had any competitor to look up to from India as a brand in medical device products. There were also procurement difficulties. Government procurement procedures, especially tenders, are heavily skewed towards the incumbent companies. It takes a lot of persuasion to break into the major tenders, which acts as a major entry barrier for startups. Nevertheless, there were also memorable milestones along the way that made the journey worth the wait

Road Ahead

The market for woundcare is at a nascent stage right now; there is a high scope for growth. Globally, we are probably the fourth or fifth company to build a product pipeline for controlling profuse bleeding in trauma. In India, we are the first ones to do so and are very focussed on making this as the first intervention to bleeding. Axio is currently growing around 3x per year and this figure could almost double next year with the global haemostatic market being about \$US 3 billion. Our product has a potential to hit \$US 400 - 500 million in the Indian market. The idea is to target every field where there are frequent bleeding hazards. We don't want to limit ourselves to hospitals and battlefields; we aim to focus on factories, mines and even households at some point. Our goal is to bring Axiostat in everyone's first aid kit, and the sole product to be used to stop bleeding. As for the B2C market we might introduce the product in pharmacies abroad earlier as the price points are much more attractive. In India, there will be a direct comparison with the low priced band-aid; hence we have made a choice to stick to B2B for the moment. In five years we plan to build the brand in a way so as to hit the market with an IPO

Advice for Budding Entrepreneurs

I would advise them to focus on the journey and not the destination. Starting a new business is not a job, but an adventure. It's a big step into a new lifestyle. In addition to a good product and business model you have to enjoy working with people and be good at managing and inspiring them. You have to embrace making decisions, set milestones, measure progress, celebrate victories and learn from your defeats. Choose which business model suits your mentality and map out a complete plan.



Cardiac Design Labs Pvt. Ltd.

Founders: Anand Madanagopal, Sashi Kumar, Mosin Badkar, Praveen L Murthy and Ajax Thomas

Year of Establishment: 2011

Location: Whitefield, Bengaluru, Karnataka

Annual Turnover: Early commercialization phase

Team Members: 23

Area: Medical Diagnostics and Monitoring



Academic Background

Anand is M.S in software engineering from Birla Institute of Technology and Science, Pilani and MCA from Vellore Institute of Technology; Sashi is B.E; Ajax is B.Tech in computer science and technology from University of Calicut and M.S in software engineering from Birla Institute of Technology and Science, Pilani; Mosin is Diploma in advanced computing, B.E in electrical and electronics engineering; Praveen is B.E in electronics and communication engineering from Bahubali College of Engineering and Diploma in electronics and communication from DRR Govt. Polytechnic and M.S in digital design & embedded systems from Manipal University



Motivation to Pursue Entrepreneurship

Our motivation has been to build products of value to the community and be able to run the business to reach these products to the masses

Identification of Business Opportunity

Except for large hospitals or specialty centres, the ability to perform proper cardiac diagnosis is absent in India. This is the case globally in all emerging markets. There is no frontline device for diagnosing Arrhythmia and Coronary Artery diseases other than Resting ECG in a small Hospital. The 10-second resting ECG is an inadequate tool to diagnose the above conditions effectively. Both these conditions require the ECG taken during ambulatory mode for comprehensive analysis. With increase in number of patients with heart diseases, and specialized cardiac diagnostic available are operable only in tertiary care centres, reach of precision diagnosis is very poor. Thus, there was a need for a solution that gives the power to cardiologists to carry out better diagnostics and help take quick decisions based on in depth-validated information without the need of being present near the patient and be able to run this kind of comprehensive analysis in small and medium hospitals. Currently no rhythm analysis is feasible in small hospitals where the large set of cardiac patients visit today. Even where these products are available ex. large hospitals, it is expensive to run the tests because of the need to run heavy back-end teams. Post-operative monitoring is also very limited when it comes to smaller hospitals

Portfolio

- MIRCaM – 12 lead Ambulatory ECG Diagnostic device

MIRCaM is a 12-Lead ambulatory ECG wearable device. It is designed for long-term /short-term monitoring, to be used in Emergency, ICU/CCU and in ambulance. It is also designed for a Holter type usage for 24/48



hour monitoring and diagnosis. The wearable device coupled wirelessly with the Mobile/Tablet makes it easily adaptable to the required scenario. Equipped with CDL's propriety algorithms and workflow software MIRCaM can analyse ECGs in real-time, and effectively detect a wide range of arrhythmias and Ischemia.

- **PADMA – Single lead Diagnostic and Monitoring Patch**

PADMA is a single channel ambulatory ECG patch. It is designed for long-term monitoring of the heart for diagnostic and post-operative purposes and is lightweight and extremely easy to use. Equipped with CDL's propriety algorithms and workflow software PADMA can analyse ECGs in real-time and effectively detect a wide range of arrhythmias. PADMA enables a remote cardiologist to view live ECG, review and report from his mobile phone.



Commercialization Strategy

We want to scale-up our business in India by partnering with care providers, channel partner, distributors and business associates who would join us in our journey. We wish to take this business global by collaborating with strategic partners. We are in the process of product certification

Products in the Pipeline

- MIRCaM Variable Lead Ambulatory ECG diagnostic device
- MIRCaM – Remote Wireless Monitoring with vitals in real time

Mentors

Dr. Valiathan M S; National Research Professor, Dr. Balakrishnan K G; Sr. Cardiologist, Fortis Hospital, Sivaram Rajagopalan; CEO, Formerly with HP Medical, Phillips, Ramani A V; Sr. Vice President R&D, TTK Healthcare and Prof. Gundu Rao; Lillehei Heart Institute

Critical Areas for Mentorship

Building a medical device and go-to market strategy

Funding Mobilized

Two rounds of funds have been raised - Angel round and seed round

Achievements

- Winner of Significant award, 2015 and 2016
- Winners of Startup Karnataka Top Tech 25 Awards, 2016
- Amongst the "Emerge 50 League Of 10" by NASSCOM, 2016
- Winner of "Grand Jury Prize" at Startup India Launchpad by Google, 2016
- "Impact" award in the GE Healthcare Product Showcase, at IOTNext, 2015
- Cardiac Design Labs won "Best IoT Start-up" award, 2015
- Cardiac Design Labs wins "Walk The Talk" competition at Intel Conference, 2015
- MIRCaM, awarded as "The Most Innovative Product" in IESA Technovation Awards, 2014



- Successful Hospital trials currently being run at national hospitals
- Cardiac Design Labs makes it to the top 100 innovative companies by Government of Karnataka – Elevate 100
- Cardiac Design Labs crosses 1400+ patients and 30,000+ hours of machine analysis – September, 2017
- Patent for MIRCaM has been published

Entrepreneurial Journey - Nutshell

We have built the products alongwith the

necessary algorithms and the applications to go with it successfully. A clinical evaluation at Kasturba Medical College, Manipal has been completed successfully. We have received recognitions and important awards for the product. The product has been under commercial deployment at different centres since November 2016

Lessons from the Journey

Bringing right skill-set together, understanding the clinical requirement and building the algorithms are some of the initial big challenges

Road Ahead

- Enable scale of this business in India
- Take this business global with strategic partners
- Bring out variants of this products that help expand the segments and target other chronic disease diagnosis with similar intelligent solutions

Advice for Budding Entrepreneurs

One should build a minimal product but with the most important features and take it to a hospital for patient testing.

No amount of laboratory testing will get the product ready and the team need to get real feedback from users at an early stage.





CareNX Innovations Pvt. Ltd.

Founders: Shantanu Pathak and Aditya Kulkarni

Year of Establishment: 2015

Location: SINE, IIT Bombay, Mumbai, Maharashtra

Annual Turnover: Rs. 45 lakhs (FY 2016-17)

Team Members: 12

Area: Medical Devices



Academic Background

Shantanu is B.E in electronics and communications from Mumbai University and Ph.D in biomedical engineering from IIT Bombay and Aditya is B.E in computer science from Government College of Engineering, Aurangabad and MS in computer science from National University of Singapore

Motivation to Pursue Entrepreneurship

During our engineering days, we started doing random technology based projects to solve societal problems. As these projects got recognised at a global platform, questions of sustainability and scalability awakened us. We realised that the only way of scalable impact and sustainability is 'Entrepreneurship'. It helps to be focused and demands creation with scale



Identification of Business Opportunity

We were doing feasibility study of our concept of doorstep care by 'CareMother' a mobile pregnancy care solution developed as healthcare delivery model. While doing that we realised it can solve the problem more effectively at much lower cost if fit in a sustainable model. Further during the pilot study, we also identified more problem statements in maternal and child health space where accessibility and demand driven healthcare is a huge gap. In India, 30 million pregnancies occur annually and more than 60% of them still do not receive proper care and existing healthcare delivery system cannot reach out to them effectively. This helped us to scale existing innovation and work on new problem statements which have bigger business opportunities

Portfolio

CareMother: A mobile pregnancy care solution to empower health-workers and early identify high risk pregnancy with doorstep diagnostics model. It consists of a portable kit of point of care devices, mobile application for health workers and doctor. We have demonstrated increase in reach/coverage by least 2X and early identification of high risk pregnancy by 33% during our pilot. CareMother sales kits are available at fixed price and software licences per pregnancy registration. We have sold more than 80 kits and 25,000+ licences so far

Commercialization Strategy

We have target customer segment and established customers. Company is already making revenue from



CareMother. Target customers are private hospitals, government health-centres and NGOs as healthcare implementing agencies. Hereon, we plan actively engage with private hospitals to strengthen their outreach and increase yield per patient. Also with current demonstration engage with Government to equip auxiliary nurse midwifery with CareMother

Products in the Pipeline

Fetoscope: A wearable device and mobile application to monitor fetal heart remotely. Fetoscope is a wearable for measuring and analysing fetal heart rate for 20-40 minutes after 20th week of pregnancy. CareNX has built a wearable device and app which shows fetal heart rate and provide beat by beat analysis which has important clinical value. Currently we are validating the Fetoscope device and expecting to launch in 6 months

Mentors

Prof. Rohit Srivastava, NanoBios Lab, IIT Bombay, Prof. Dr. Padmaja Mavani, Sr. Gynaecologist, KEM Hospital, Mumbai, Anuj Sharma, believer of Social Entrepreneurship, ASCo, India and Mike Young, PhD, Stanford and Entrepreneur, Silicon Valley, USA

Critical Areas for Mentorship

Clinical validation and regulation, business model & pivoting and partnerships

Funding Mobilized

Rs. 25 lakhs from SINE, IIT Bombay, Rs. 16 lakhs from UN WOMEN, Singapore, Rs. 10 lakhs from UN Habitat and Rs. 50 lakhs from GCC, Canada

Support from State

TBI service tax exemption through SINE, IIT Bombay and exhibition facilitation

Achievements

- Google's "SMB Heroes" National Winner, 2017
- First milestone of 100 Kits and 30,000 CareMother app licenses achieved, 2017





- Top 10 start-up for World Health Summit, Berlin, Germany, 2017
- Selected for Accelerator Programme by Singularity University, SULabs at Silicon Valley, USA, 2016
- UN Women “Project Inspire” Award of USD 25,000 for CareMother, 2016
- The President of India’s “Innovation Scholar in Residence Award, 2015”
- India Youth Fund, UN-Habitat Award for CareMother, 2014-15

Entrepreneurial Journey - Nutshell

Learnings on the way are the first success story. We are delighted when a customer gives feedback about usability and most importantly repeated order. CareMother which was just a concept now have reached to more than 8000 pregnancies in remote regions. We have already sold 25,000+ software licences hence minimum 30,000 pregnancies will be provided better care through CareMother in 2017-18. This reach has helped us forge new partnerships and a platform to test our pipeline product. CareNX is now also introducing a wearable device and platform to connect pregnant women and gynaecologists in urban and semi-urban areas as well

Lessons from the Journey

Solving social or to be specific last mile care challenges requires beyond technology and innovation. Studying the ecosystem and understanding who can be best partner can help in handling these challenges. Until and unless there is demand driven or market driven approach, scaling or growth will be challenging. Ultimately, strong, scalable and replicable revenue generating model is highly required and should be the first priority of a startup

Road Ahead

There is huge potential and opportunity in maternal & child health and provision of quality in healthcare access. In next 5 years, we hope to reach 3 million pregnancies in India and other developing countries. We also plan to bring our pipeline innovations into market using the existing channels. In next five years we should be known as innovative company in point of care solutions for maternal and child health

Advice for Budding Entrepreneurs

- Enjoy the journey and learnings on the way, it’s tough but fruitful
- Build a good team as without it the picture is incomplete
- The point you think of giving up, you are close to the solution. And if you are not enjoying its better not to waste time



Embryyo Technologies Pvt. Ltd.

Founder: Nishant Kumar and Prateek Jain

Year of Establishment: 2014

Location: Pune, Maharashtra

Annual Turnover: Rs. 85 lakhs (FY 2015-16)

Team Members: 10

Area: Medical Devices



Academic Background

Nishant and Prateek are B.Tech and M.Tech in mechanical engineering from IIT Bombay

Motivation to Pursue Entrepreneurship

Our motivation to pursue entrepreneurship has been fuelled by a passionate interest in the medical technology domain and an accumulation of a long list of clinical need statements and ideas. Entrepreneurship was considered as the perfect mechanism to work on these ideas and convert them to reality with a vision to create a sustainable positive impact in the society with scientific and technological advancements in healthcare



Identification of Business Opportunity

We have positioned Embryyo as a medical technology R&D company specializing in clinical need finding, inventing and commercial validation of novel medical devices. The business model involves strategic technology licensing. This business model was finalized through a continuous iterative process over the period of last three years and is based solely on the core skill-set of our team. The product ideas were selected on the basis of clinical need burden, customer feedback and interviews, IP and technology landscape and the long term impact the products could have in global health.

Portfolio

The following products are under development and are at various stages of development and maturity:

- BoxRx – An electronic drug adherence monitoring system
- Biliscope – An affordable, non-invasive, transcutaneous bilirubinmeter for the detection of neonatal jaundice in newborns
- UnFurl – A self-expandable non-vascular stent for esophageal applications
- NeoBrain – A cotside infant physical brain growth monitoring system
- WombScope – A novel intra-uterine growth retardation predictor without using ultrasonography
- Plasmatrix – A point-of-care microfluidic blood plasma separation device

Products in the Pipeline

We have 10+ inventions in the pipeline in diverse areas such as haematology, maternal and child health and interventional devices



Mentor

Prof. Soumyo Mukherji, Professor, Department of Biosciences and Bioengineering, Indian Institute of Technology Bombay, Prof. Amit Agrawal, Institute Chair Professor, Department of Mechanical Engineering, Indian Institute of Technology, Dr. Guruswamy K., Scientist, CSIR NCL, Dr. BLV Prasad, Scientist, CSIR NCL, Ms. Leith Greenslade, Founder and CEO, JustActions, Vice-Chair United Nations MDG Health Alliance, Dr. Premnath Venugopalan, Founder and Director, Venture Center and Ajay Chamania, Founder and CEO, Agiliad

Critical Areas for Mentorship

Intellectual Property management, organization building, business development, global health policy and clinical knowledge

Funding Mobilized

Funds in the form of grant-in-aid - \$US 1,00,000 from Grand Challenges in Tuberculosis Control in India - Bill and Melinda Gates Foundation, USAID and IKP Knowledge Park, \$US 1,00,000 from Grand Challenges Explorations, Bill and Melinda Gates Foundation, Rs. 40 lakhs from DBT – BIRAC (SPARSH) and Rs. 47 lakhs from DBT – BIRAC (BIG)

Support from State

Service tax exemption

Achievements

- Selected by MIT Technology Review India and Mint as top 10 innovators under 35 for the year 2017
- Top 10 Most Promising Startup award in the Industrial Innovation category and the Best Startup in the Manufacturing category in India awarded by the Confederation of Indian Industry (CII), 2016
- Selected amongst Top 40 'Innovations in Medical Science and Biotechnology Showcase' during the Festival of Innovations in the Lawns of the President House, hosted by the Indian Council of Medical Research (ICMR)
- Selected as the Top 10 teams under the Intel DST Innovate for Digital India Challenge hosted by CIIE, IIM Ahmedabad
- Top 4 teams in the country to win the Grand Challenges in TB Control in India award from the Gates Foundation and USAID
- One of our team members won the Top 6 award at the Women's Entrepreneurs Quest organized by DST, Gracehopper India and Anita Borg Institute, and also a free learning trip to Silicon Valley, USA
- Won the first runners-up award at a medical technology Hackathon at GE Healthcare, organized by CAMTECH (consortium for affordable medical technologies, Massachusetts General Hospital)
- One of the product innovations under development, in the area of fetal growth monitoring was selected as a commitment to the UN Secretary General's Every Woman Every Child Initiative
- Selected and invited for product showcase and workshop on social innovation at the Geneva Health Forum in Geneva, 2016
- Selected as a member of the United Nations Global Compact
- One of the winners and top 18 finalists of the 5th





M2D2 (Massachusetts Medical Device Development) 100K Challenge at UMASS Lowell, Boston, and the only team from outside the United States

- Selected as the Top 25 team in the world under the Social Innovation in Health Initiative program, organized by WHO TDR, Skoll Center for social entrepreneurship at Oxford University and Bertha Center at the University of Cape Town
- Invited to participate in Evidence-based Social Innovation Consultation: Re-imagining Healthcare Delivery Systems in the Global South, at Foundation Mérieux in Veyrier-du-Lac, France and WHO Headquarters in Geneva, Switzerland
- Invited at the Innovation Showcase at the Every Woman Every Child Private Sector-Innovation Working Group Event in New York as one of the showcasing teams

Entrepreneurial Journey - Nutshell

Since high school, I wanted to become both a doctor and an engineer as I had deep interests in mathematics as well life-sciences. On completion of 12th board examination in 2005, I cleared the IIT Joint entrance examination and joined IIT Bombay as an undergraduate student of Mechanical Engineering. During college, I was very fascinated about building robots and had represented the institute team at national and international level robotics competitions. After the end of my third year in college, I got an opportunity to carry out summer research internship at the University of Munich, Germany for three months. I worked with clinicians and physicists at the Institute of Clinical Neurosciences and developed a novel algorithm for eye-gaze tracking of an award-winning head mounted eye-gaze tracker (www.eyesecam.com) developed by their group. During my stay, I had the opportunity to closely observe the healthcare facilities in the hospital which was equipped with all the modern medical devices and equipment and state of the art technologies. I also noticed that these hospitals catered to a very low number of patients. The situation was a complete contrast with the condition in India where hospitals are often resource constrained and cater to a large flow of patients. This was turning point in my life and I decided to utilize my engineering skills into building biomedical devices and applications.

After returning to college, I took several elective courses at IIT in the School of Biosciences and Bioengineering – courses ranging from biomaterials to medical instrumentation, clinical physiology etc. At IIT, I was enrolled in the Dual Degree program, where I had to undertake a project in the final year for my Master's Thesis. I worked with Prof. Amit Agrawal from the Department of Mechanical Engineering at IIT Bombay on the study of blood flow in micro-channels and on the design of microfluidic devices for lab-on-a-chip applications. The work resulted in a couple of international publications.

After my graduation, I got a job at Philips Healthcare as an R&D Engineer. My responsibility was to design an interventional X-ray C-arm system for the value segment market. Philips Healthcare had acquired two Indian companies – Alpha and Meditronics to establish their R&D center in India. I worked with Philips for 2 years and successfully built the x-ray system alongwith the rest of the Philips team. Later, I joined Agiliad Technologies as a Solutions Specialist for the Medical Devices business unit, a product engineering services company based in Pune. Over the years, I had invested a lot of time and effort in meeting doctors, reading medical literature, attending medical trade fairs and exhibitions, and had collected more than 200 ideas on clinical need statements and the possible technology solutions.

In 2013, I left Agiliad to plunge into entrepreneurship and to establish the new company. At the same time, one of my close friends and class-mate from IIT Bombay Prateek was also exploring similar opportunities and we got together to set up the new company. The vision of the company is to improve global healthcare through technology. After leaving our jobs, we started to meet a large number of doctors to validate our ideas and began prototype development. We also started connecting with investors interested in the medical technology space. After about 6 months since we left our jobs, we got incubated at the Venture Center as associate incubatees. We started applying for funding in the form of grants from government organizations and philanthropic organizations.



We got the first success in the form of Grand Challenges in TB Control which was a grant award of \$US 30,000 for a period of 6 months and we were required to develop a drug adherence monitoring system for TB patients in India. After successful pilot testing of the product, we have now been approved funding of around \$US 1,00,000 to conduct the field testing of the product with a minimum of 200 patients. Thereafter, we also collaborated with senior scientists from CSIR NCL to develop novel self-expandable non-vascular stents. Meanwhile, our team has grown from just founders to new people onboard. Also, Prateek and I have become Fellows of the Pune Chapter of Startup Leadership Program. We are also working with professors from IIT Bombay to develop medical devices, supported by the Tata Design Center at IIT Bombay

Lessons from the Journey

- Need for basic processes – During the initial years of the company, we faced lot of difficulty in carrying out product development in the absence of basic processes like materials management, purchase, accounts and compliance in the company. Being first time entrepreneurs, we were simply not cognizant of the importance of this aspect. As a result we ended up spending a lot of time in managing and organizing such activities. Eventually, we have now solved the problem by having an experienced part-time CFO for the company
- Team building – In the initial years, we struggled in building the right team to work on the product ideas. This was often the result of mismatched expectations, misalignment with the objectives of the company and an unclear demarcation in the tasks and responsibilities of the core team. We have now achieved a fair understanding on building our team after including several people in the team in several modalities such as full-time, part-time, consultants, interns and partners
- Acquiring new skills and knowledge – It was evident that the technology and product skills alone are not sufficient in setting up and running a medical technology R&D company. We experienced a lot of knowledge gap in the core team in various other aspects such as IP management, clinical study design and implementation and regulatory requirements. We managed to bridge these gaps by actively participating in numerous related workshops and training sessions at both national and international forums

Road Ahead

In the next five years, we expect to have achieved the following –

- Successful completion of the ongoing development of our products and out-licensing to interested partners
- Creation of numerous other inventions and technologies in the pipeline
- Establishing a robust quality management system in the company at par with global medical devices organizations
- Achieving a state of self-sustainable revenue and profits through national and global technology sales
- Establishing Embryo as a globally reputed medical technology R&D company producing cutting edge inventions and innovations

Advice for Budding Entrepreneurs

- Perseverance with an unwavering focus is a must and simultaneously being agile enough on the way to experiment various ideas and pick the best fit paths towards the grand vision
- Clearly identifying the key areas in which one can add or create maximum value and building a business model for the company around that can be an optimum strategy in the initial years of the company
- Soft skills are as valuable as the core technology, product design skills and there should be a conscious effort to acquire and improvise on them
- Result orientation with maximum efficiency in execution with minimal resources is essential for success.



E-Spin Nanotech Pvt. Ltd.

Founder: Sandip Patil and Jagruti Patil

Year of Establishment: 2010

Location: SIDBI Innovation and Incubation Center, IIT Kanpur, Uttar Pradesh

Annual Turnover: Rs. 1.4 crores (average)

Team Members: 18

Area: Biomedical Instrumentation



Academic Background

Sandip is Ph.D in chemical engineering from IIT Kanpur and Masters in computer management from North Maharashtra University in Jalgaon

Motivation to Pursue Entrepreneurship

Our motivation has been to establish state of the art research facility equipped with cutting edge technology for developing affordable products to address the unmet basic needs of the society

Identification of Business Opportunity

When I was pursuing Ph.D at IIT Kanpur under Prof. Ashutosh Sharma, now Secretary DST, I was put up with a challenging task to develop an instrument for our lab which can create nanofibers in single step. Considering this to be a great opportunity to accomplish my Ph.D curriculum in better way, I took this uphill task and developed the machine within six months. Subsequently, few Ph.D students and I began are research work with the new machine which is working in hassle-free manner even today. This was the time when nanofiber technology was taking shape in the world. Based on the performance of the machine, I realised that why shouldn't commercialise it? My advisor Prof. Ashutosh Sharma also encouraged me to pursue the commercialization of this technology. I was certain that this machine will be very helpful to many R&D labs, institutions, universities and other colleges for nanofiber research. To embark on this exciting venture, I initially sought help of SIIC-IIT Kanpur to understand the business model for the product, market feasibility and recent market trend. As an outcome of this survey, we found out that there is only one company in India which was providing nanofiber fabrication solution to R&D sector. With such limited competition, I decided to work on the product and launch it into the market



Portfolio

- Nanofiber spinning machine for development bio-scaffold and nano-biomaterials
- Wet-Spinning machine: Carbon fiber its application biomaterials
- Hollow fibre spinning machine
- Industrial nanofiber spinning machine development bio-scaffold and nano-biomaterials
- E-Spin Nanotech is already working on projects with Indian and foreign R&D sector/ labs like University of Wyoming (USA), IIT Kanpur (India), IIT Guwahati, IIT Hyderabad (India), NCBS Bangalore (India). Apart from this E-Spin is also providing consultancy in diverse manufacturing activity.



Commercialization Strategy

To sell the products, we started with digital marketing and research-based interactions with institutions. Considering this strategy, we started selling lab scale nanofiber spinning machine to various R&D labs in India and other countries. The revenue which is generated from selling lab-scale machine was utilized to develop industrial-scale nanofiber machine for industrial applications. This model of marketing made E-Spin Nanotech sustainable

Products in the Pipeline

- Affordable Nanofiber based inline water filter for households which removes virus and bacteria from water
- Industrial Nanofiber fabrication machine for nanofiber based product development. It will use clean water, clean air, smart textile and healthcare nanofiber based product development at industrial scale
- Affordable Nanofiber based sanitary napkins for rural sector which is still beyond reach of rural women. This product will be jointly developed with IIT Hyderabad

Mentor

Prof. Ashutosh Sharma, Department of Chemical Engineering, IIT Kanpur

Critical Areas for Mentorship

Business expansion, connections and networking

Funding Mobilized

Rs. 25 lakhs seed loan from IIT Kanpur

Achievements

- TIME India Startup Innovator for the Year (Top 3 Finalist), 2017
- Young Entrepreneur Award by TiE-UP, 2017
- Awarded Top 5 Nano Technology Companies in India by Silicon India, 2016
- Awarded Ten Young Outstanding Young Person in Kanpur from business achievement
- Spirit of Manufacturing Awards: Most Promising International Business Leader Award, 2015
- Indian Leadership award for industrial development by All India Achievers Foundation, 2014
- Rajeev Motwani Young Entrepreneur award, 2014
- IICCh Shah-Schulman Award for the best PhD Thesis in the area of Colloid and Interface Sciences, 2013
- Indian School of Business Hyderabad Scholarship, 2013
- UICT Jalgaon alumni award for Young Entrepreneur, 2013
- IICCh M. P. Chary Memorial Medal award for being an outstanding young Chemical Engineer, 2012
- Intellectual Ventures Invention Award, 2012
- TePP award, 2011





Entrepreneurial Journey - Nutshell

As a first step, E-Spin Nanotech Pvt. Ltd. was registered in November 2010 and subsequently in the year 2011 we started selling our product. With such grand success with our products we were named as top five Nanotechnology Company by Silcone India. With the advent of nanotechnology, new products have flooded the market and to keep up with this race we strive on innovation based engineering which lends a vital edge over other contemporaries. Leading with a holistic approach, we have successfully achieved a landmark by selling 50 indigenously developed electrospinning units all across the nation and to overseas organizations in US, Denmark, Saudi Arabia, Egypt, Israel, Bangladesh, France, Malaysia and Spain. The special attribute of this achievement is that, each of these equipment is unique for its own reasons as they are re-designed and engineered to meet specific needs of customers. Thus, E-Spin Nanotech is often looked upon for its hallmark trait of need based product service along with the science and engineering behind it

Lessons from the Journey

While establishing E-Spin Nanotech, I have faced several roadblocks and the biggest of them was the identifying conducive location for setting up the factory (Kanpur). Initially I had no workshop of my own and I had to procure manufacturing parts from third party which was further complicated by lack of good manufacturers at Kanpur to provide good quality components as a result of which I had to go to Delhi to look for a better alternative. Although I could locate few manufacturers but there too I had to compromise on quality. Manufacturing quality in the Kanpur was biggest challenge, initially it was difficult but then we have to find solutions somehow. With the existing scenario, I had to compromise 20% on the quality but I did guarantee my clients that if the machine doesn't work then I will design a new machine for them and fortunately, that has never happened. Apart from this, the second major roadblock was human resources as it was difficult to find trained and highly motivated workforce in Kanpur

Road Ahead

In next 5 years, we would like to reach the target of Rs. 40 - 50 crores in the area of quality manufacturing of nanofiber related products and equipments. Our plan is to target 30-40% profit margin with adopting smart and automated manufacturing technology for product development. Adaptation of smart manufacturing will help us to improve the manufacturing quality and improve the production. Apart from manufacturing sector, we are also extended our reach to:

- In commodity sector: We are in process of licensing the technology from IIT Hyderabad to manufacture low cost, hygienic superabsorbent sanitary pads.
This is nanotechnology-based nanofiber coatings developed for sanitary napkins
- In Research and Development sector: E-Spin Nanotech is already working on projects with Indian and foreign R&D sector/ labs like University of Wyoming (USA), IIT Kanpur, IIT Guwahati, IIT Hyderabad, and NCBS Bangalore. The role of E-Spin in collaborations with these labs is to provide inputs in product development and also in manufacturing and commercialization of lab prototypes. Currently E-Spin is providing these institutes all possible help in manufacturing and commercialization activity

Advice for Budding Entrepreneurs

- Future is a mystery. Both good and bad can happen
- One should not be intimidated by fear of failures
- Think of innovative ideas and take the plunge.



ExoCan Healthcare Technologies Pvt. Ltd.

Founder: Aman Sharma

Year of Establishment: 2015

Location: Venture Center, NCL Innovation Park, Pune, Maharashtra

Annual Turnover: Rs. 5 lakhs (average)

Team Members: 4

Area: Molecular Therapeutics



Academic Background

Aman is M.Sc. in biotechnology from University of Pune and Ph.D from NCCS, Pune

Motivation to Pursue Entrepreneurship

My motivation has been to bring out laboratory research from academia to society for the betterment of human health

Identification of Business Opportunity

Since mortality rate of cancer is high and India hardly produces diagnostic facilities in oncology despite the talent pool, I thought I would build upon a vibrant Indian research ecosystem and develop new technologies in field of cancer diagnosis

Portfolio

We have launched 5 products for cancer R&D laboratories/ universities/academia in India which are already generating revenue for us. We launched Exosome isolation kits last year. The products are used by scientists to understand how a disease progresses, develop therapy resistance and alterations occurring during a disease manifestation. Kit can be used for disease e.g. cancer, diabetes, immune-disorders, infectious diseases etc. The clinical version of these products could be used for disease diagnosis



Commercialization Strategy

We have already commercialized a few innovative products indigenously developed at our laboratory. Currently, the focus market is Indian R&D establishments and we plan to move abroad in future

Products in the Pipeline

There are 4 innovative products are in pipeline

Critical Areas for Mentorship

Primary critical areas are: Applied scientific learning and problem identification in a research lab setting, academic environment and problem oriented approach rather than result oriented reasoning. It is also important



to develop an ability to understand market dynamics and similar research innovations in your field of interest. Moreover, budding entrepreneurs need to develop a long term vision if they are starting a scientific enterprise and should not focus much on short term gains

Funding Mobilized

Funds from DBT – BIRAC (BIG)

Achievements

- Developed a range of products in two years
 - Recognised by DIPP under Start-up India Initiative
 - DSIR recognition for our R&D unit
 - Published 3 international peer reviewed articles in high impact factor journals
- Various academic tie-ups and media coverage



Entrepreneurial Journey - Nutshell

From an idea-stage start up, we have grown to revenue generating, DSIR recognised R&D unit with a decent product portfolio in less than 2 years of our journey. Within two years of its establishment, ExoCan has grown into an intensive R&D unit actively pursuing research in development of cancer diagnosis, and drug delivery platform technologies with a total manpower of four employees. The company was incorporated through a BIRAC seed grant in 2015. ExoCan also received follow on funding in collaborations with our academic partners. ExoCan is also contributing to skilled manpower generation in biotech by providing training to candidates through BCIL training programs of DBT

Lessons from the Journey

Initial challenges were setting up the R&D laboratory and to complete an innovative project within 18 months of timeline. Using a unique de-risking approach, and taking up R&D challenges over the course of time, we were able to develop a range of innovative products and commercialize them in India

Road Ahead

We see our company to be one of the most innovation-driven R&D company in oncology in next five years. Also, we believe that we would be generating fair enough revenue with our products & services in years to come

Advice for Budding Entrepreneurs

- Have a great risk-appetite if you choose to be an entrepreneur
- Develop patience to tolerate adverse conditions during your journey
- Keep your eyes sharp open all the time to catch unanticipated results, as the R&D might lead to something different that you were not anticipating.



Med Invent Devices Pvt. Ltd.

Founders: Suven Bhattacharjee and Shipra Bhattacharjee

Year of Establishment: 2016

Location: Kolkata, West Bengal

Annual Turnover: Rs. 30-40 lakhs (expected FY 2017-18)

Team Members: 10

Area: Medical Devices



Academic Background

Suven is Postgraduate Ophthalmologist from JIPMER Pondicherry, FRF (Fellow of Retina foundation, Ahmedabad) and Shipra is Postgraduate Paediatrician from Pt. Ravishankar Shukla Univ, Raipur, Diploma in Child Health from Calcutta University.



Motivation to Pursue Entrepreneurship

Though the 'B-HEX Pupil Expander' or 'Bhattacharjee Ring' has a radically different and better concept, device manufacturers were not keen on investing time and money in developing it. Suven handcrafted 300 pieces of the 1st Generation B-HEX using 0.1 mm Nylon filament (5-0 surgical suture material) at his home based lab for global human trials including one registered trial at Rothschild Foundation Paris. His work won him the best paper award at the All India Ophthalmological Society (AIOS) and American Society of Cataract & Refractive Surgery (ASCRS) meeting in 2014 and also received rich testimonials from global key opinion leaders. It was also a top innovation at the India Innovation Growth Program (IIGP 2016). It was clearly easier for the surgeon, safer for the patient and economical for healthcare systems. Yet the medical device industry seemed hesitant. Determined to bring his idea to fruition, Suven launched the B-HEX Pupil Expander through his company Med Invent Devices Pvt. Ltd. at less than 40% of the cost of the market leader the 'Malyugin Ring'. This not only reduces cost burden to the patient and healthcare system, it also saves India valuable forex

Identification of Business Opportunity

The market leader 'Malyugin Ring' is a manually made device and has a glued joint. The design does not allow it to be machine manufactured. It is unsafe, inconsistent and has limitations. The 'B-HEX Pupil Expander' has a simple design and can be machine-manufactured consistently reducing production times and costs. A significant amount of time, effort and money had already been invested in R & D and it did not make business sense to hand over the IP rights and business opportunity to a third party for a paltry royalty. The product did not require a very elaborate manufacturing set up since parts could be outsourced and partly assembled and then forwarded to a second stage manufacturer cum distributor. Med Invent Devices did not require a marketing force either because the distributor already had distribution and sales channels in place

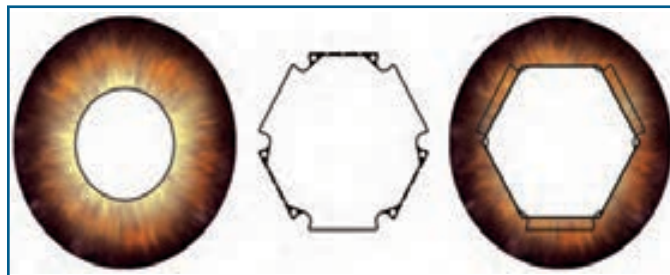


Portfolio

B-HEX Pupil Expander has been commercialized in February 2017

Products in the Pipeline

A few products at concept stage but no IP filed yet or prototypes made



Mentors

Baba Shiv, Stanford Graduate School of Business and Erik Azulay from IC2 Institute, University of Texas, Austin

Critical Areas for Mentorship

Hand-holding and advisory facilities for entrepreneurs in India leave a lot to be desired. An entrepreneur has to spend valuable time and resources to obtain small bits of information which could have been easily provided by the designated offices. Mentors with first-hand experience in running their own small or big start-ups are invaluable. Nothing impresses an entrepreneur more than lessons learnt from their mentors' first hand experiences. Stories narrated from others experiences/ literature is remembered by the entrepreneur as lessons but they don't really look up to the mentor to solve their problems with conviction. Emphasis and guidance on a written down business model canvas with frequent revisions is probably the most important step. Anticipating failures and setbacks, preparing for them with a plan B and learning lessons from them

Funding Mobilized

Rs. 46 lakhs from DBT – BIRAC (BIG) and personal savings

Support from State

Approved by Inter-Ministerial Board for Income Tax Benefits as a Start-up (DIPP1179)

Achievements

- Top Innovator & Gold Medallist: DST - Lockheed Martin: India Innovation Growth Program, 2016
- International Ophthalmic Hero of India Award - All India Ophthalmological Society (AIOS) Conference, 2017
- Best paper American Society of Cataract & Refractive Surgery (ASCRS), 2014
- Finalist BMJ awards India 'Innovation in Healthcare', 2014
- Col. Rangachari award - best Overall paper - All India Ophthalmological Society (AIOS) Conference, 2014
- Sante Vision award - best Cataract paper All India Ophthalmological Society (AIOS) Conference, 2014
- Runner-up: Video Competition: Cataract Section; Asia Pacific Society of Cataract & Refractive Surgery (APACRS), 2014

Entrepreneurial Journey - Nutshell

Med Invent Devices Pvt. Ltd. believes that there is always a simpler, better and cost effective way to do things – we only need to identify it. We started with manually manufactured home based lab prototypes in 2013. The machine-made prototypes were available in mid-2016. After a few iterations and clinical trials the commercial version was launched in Feb 2017 at the All India Ophthalmological Conference. The product was completely sold out and pending orders are mounting



Lessons from the Journey

Dealing with failures and pivoting were the most important lessons learnt. Failures at the prototyping stage were difficult to handle because we had not provisioned for them. We would get upset and put off the project. With time we learnt that failures are an integral part of the journey and that we needed to look for lessons in the failures. That made it easier and we could get back to the project very soon with a fresh start. Pivoting



was another key lesson. US being the largest market for medical devices our strategy was to have our product authenticated there and then spreading globally. However, after series of negotiations we realized that blanket regulatory issues were a deterrent to even clinical trials. On the other hand, this is not a notified medical device in India and the demand for a user friendly, safer and economical option was growing. Since our product was market ready, we pivoted and decided to beta-test the device by sending out samples to 30 key opinion leaders in India. We formed a closed user group which was self-learning and evolving. This was a very strategic decision and cost us nothing but the samples. Of course, the credibility we had built with scientific presentations and awards and the innovator-entrepreneur being from the same fraternity were contributory. We received such an overwhelming response that we had to hurriedly launch at the next All India Conference. Not only did we receive rich accolades, we were completely sold out. The key opinion leaders now voluntarily serve as ambassadors for the product and mentors for new users

Road Ahead

By providing a better and economical option Med Invent Devices is already saving the India valuable forex. Our next step will be to expand our markets and export so that we can earn forex. While we will be sensitive to the demands of the market and better our flagship product we plan to bring at least 2 new products in the next five years. As we grow we will probably go in for one or two rounds of financing. We plan have an in-house think-tank of key opinion leaders and innovators and to use it productively. We will try to grow inclusively and also pool in expertise and provide hand-holding support to innovators and entrepreneurs

Advice for Budding Entrepreneurs

An entrepreneur inherently has the courage and conviction to challenge the status quo. However, sometimes the confidence in one's product, service or methods may be misplaced. Often ignorance is a contributory factor. It is a good idea to seek validation of the concept, product, service or methods by participating in grant applications, competitions and workshops. It is important to listen to experienced players and avoid reinventing the wheel. Success is good and necessary for an entrepreneur but failures teach lessons for a life time and make one stronger. So welcome failures and look for the lessons. Pivoting is a key asset of a successful entrepreneur. Be open to options and change in plans. Some doors will close unexpectedly while others will open equally unexpectedly.



Medprime Technologies Pvt. Ltd.

Founders: Samrat, Greeshma Unnikrishnan, Mahesh Kumar Rathor and Binil Jacob

Location: SINE, IIT Bombay, Mumbai, Maharashtra

Annual Turnover: Rs. 10 lakhs (average)

Team Members: 11

Area: Medical Devices



Academic Background

Samrat is Bachelors in biomedical engineering from VIT University and Masters in biomedical engineering from IIT Bombay; Greeshma is B.E in biotechnology from Birla Institute of Technology, Mesra and Masters in biomedical engineering from IIT Bombay; Mahesh is B.E in biomedical engineering from SGSITS, Indore and M.Tech in biomedical engineering from IIT Bombay and Binil is B.E in electrical and electronic engineering from College of Engineering Kidangoor and M.Tech in biomedical engineering from IIT Bombay

Motivation to Pursue Entrepreneurship

Being innovative in nature, we developed several devices for healthcare applications. After development, we wanted the benefit of the products to reach the population and we realised that the right people to do it are the inventors themselves

Identification of Business Opportunity

Our personal experience along with our educational qualification, gave us a detailed idea about healthcare scenario in India, particularly medical device sector. There is a lack of availability of even the most basic devices in rural areas. Most medical instruments used in the country are imported from other countries thereby resulting in the cost of treatment for the common man

Portfolio

- Cilika- World's first smartphone integrated microscope for clinical and research applications
- Infucheck- Infusion monitoring system

Cilika is the world's first smartphone-integrated microscope suitable for clinical and research applications. It comprises of an indigenously designed optical system and a mobile phone or tablet is used to display the magnified image, allowing it to be captured as a digital image which can then be subsequently

stored, transferred or processed. The variable magnifications of upto 1500X allows detection and differentiation of malarial parasites, easy identification of Tuberculosis bacteria, visualization of detailed morphology of microfilaria, etc. The product allows recording of images/videos simultaneously during diagnosis as well as facilitates report making and printing directly. This greatly enhances the workflow of practising pathologists



Commercialization Strategy

Currently, pilot studies are ongoing with 35 units installed in various states of India. The product was launched in January, 2017. Sales and distribution will be through a network of distributors and dealers across the country. We have currently put InfuCheck on hold and are focusing on commercialization of Cilika. Cilika is available in



both portable as well as benchtop versions. Cilika microscopes will be available on purchase, as well as on a rental model to the users, thereby allowing them access to the most high-end features and software support at affordable monthly rates. This is due to the high capital requirement for the manufacture and distribution of InfuCheck. We will pursue commercialization of this product after raising funds

Products in the Pipeline

- Semi-automated sample slide preparation
- Image processing and machine learning for assisted diagnosis using Cilika

Mentors

Dr. Debjani Paul, Assistant Professor, IIT Bombay and Mr. RKP Verma, former President, Transasia Biomedicals

Critical Areas for Mentorship

Being an entrepreneur in the hardware space, we have seen a lack of support and infrastructure available for startups in this sector. Mentoring is required on the aspects of development of revenue models, scaling up strategies, manufacturing, quality control and distribution is also required

Funding Mobilized

Rs. 50 lakhs from business plan competitions, seed support from business incubator and family

Achievements

- Selected among top 17 innovations to showcase Cilika at Rastrapati Bhawan, 2017
- Winner of Startup funding conclave, Indore, 2017
- MicroPrime (Inverted digital microscope) exhibited at Rashtrapati Bhavan as a part of Festival of Innovations, 2016
- Grant received from Economic Times Power of Ideas, 2016
- Winner of Starthealth competition organized by Unitus Seed Fund, 2015
- Winner of TATA First Dot organized by NEN, 2015
- Runner-up in Eureka! by E-cell, IIT Bombay, 2015



Entrepreneurial Journey - Nutshell

Our product has been appreciated and purchased by some of the renowned public and private institutions in the country both public and private. We are working with state governments to implement Cilika for the betterment of rural health. The positive response received so far gives us the confidence that we are on the right track

Lessons from the Journey

- Formation of team
- Understanding the initial business strategies
- Identifying the person who can help in understanding then asking help from them

Road Ahead

We see ourselves as India's top company in the field of digital microscopy and related diagnosis

Advice for Budding Entrepreneurs

- Carefully select your team
- Asking help always works, so don't hesitate for asking help.



Shilps Sciences Pvt. Ltd.

Founder: Ashwin Lal

Year of Establishment: 2013

Location: Bengaluru, Karnataka (non-resident incubatee of C-CAMP)

Annual Turnover: Rs. 15 lakhs (average)

Team Members: 4

Area: Medical Devices



Academic Background

Ashwin is M.Sc in physics from IIT Kanpur, Ph.D in microtechnology from EPFL Switzerland and Post-doctoral fellow from McGill University, Canada

Motivation to Pursue Entrepreneurship

Our society has shied away from building or designing complex products. While there has been some great success in space and nuclear sector, by and large, we are not engineering leaders. Engineering touches our lives so much that we cannot afford to just get handed down products from the West. With my love for engineering and building things, I found limited opportunities for leadership roles in India. So, I decided to change things a bit. With nanotechnology as my strength, I got together some like-minded people and took the plunge into entrepreneurship



Identification of Business Opportunity

The business opportunity has been identified in consultation with cancer doctors and researchers

Portfolio

- Our first product is an atomic force microscope (AFM), designed especially for life science segment. The AFM is an extremely high resolution microscope, which uses a micro-probe to see nanometer features below the limits of an optical microscope. We are conducting trials for clients
- Our second product is a platform technology to isolate and analyse single cells. This is being developed for biotechnology industry and advanced diagnostics. Based on our proprietary technology, we have done proof-of-concept studies and are working towards first prototype

Commercialization Strategy

For our first product (Atomic Force Microscope), we are doing trials with a few clients, with the goal of short term service projects and product sales. We are also exploring tie-up with a group for use in education and training

Mentor

Dr. T. S. Sridhar, cancer doctor and researcher, St. John's Medical College



Critical Areas for Mentorship

In science driven field, entrepreneurs often lack the knowledge of marketing, finance and business development

Funding Mobilized

Funds from grants, family and friends – Rs. 1.2 crores

Achievements

Multiple patents at various stages of the entrepreneurial journey

Entrepreneurial Journey - Nutshell

We have moved higher on the product development pathway considerably with respect to IP, prototyping and client demonstrations. It has been a learning experience. There have been ups and downs. We have faced existential crisis on more than one occasion. But we have also received strong support and recognition from clients and the biotech community. We have made good friends. The team truly believes in what we are doing and has stood steadfast. Through our journey, we have managed to keep moving towards our goals

Lessons from the Journey

Team with complementary skill set is essential. We have been able to rope in people with diverse skill set such as medicine, finance, legal etc. and use them as resources. Arranging funds and managing money becomes critical and building networks quickly is crucial

Road Ahead

We have crossed the difficult phase of finding a market fit. We see that both clients and large suppliers recognize our strength. We expect to build valuable partnerships with technology leaders. We expect to be able to roll out our product in 1-2 years and build a client base

Advice for Budding Entrepreneurs

Be clear about the value proposition and make sure that your product/service has sufficient value addition. Realize that in many cases the new product or service will be used many years in the future, so factor that in your plans. Be ready for the long haul. Bring talent and right skill sets in your team. Be mindful of the ecosystem available to you. Large companies are good at operations and a startup is good at innovation. Realize that the goal is to move from the startup mode towards systematic processes and operations



Sohum Innovation Labs India Pvt. Ltd.

Founder: Nitin Sisodia

Year of Establishment: 2012

Location: Bengaluru, Karnataka

Annual Turnover: Rs. 25 lakhs (average)

Team Members: 6

Area: Medical Devices



Academic Background

Nitin is B.Tech in electrical engineering from National Institute of Technology in Bhopal, Masters in industrial design from National Institute of Design, Ahmedabad and Stanford India Biodesign fellow

Motivation to Pursue Entrepreneurship

I was a fellow of Stanford India Biodesign in 2010-11. After finishing the fellowship stint at Stanford, I came back to India and pursued the clinical immersion portion of the fellowship at their child development clinic, AIIMS. One day, a parent walked in with his son who was about 5 years old and unable to speak. After a few medical tests, doctor revealed that the real problem was that the child couldn't hear. Research indicates that it is possible for a child to speak even if they can't hear provided timely intervention takes place. Unfortunately, in this case medical help was missing and child would neither be able to speak nor hear for life because of lack of timely screening and intervention. After analysing the technology landscape, market impact, social impact I decided to develop a technology which can screen babies for hearing loss in resource poor settings



Identification of Business Opportunity

In India, 26 million babies born every year need to be screened for hearing impairment. We aim to start with institutional births (urban), which address 47% of these births (12.2 million) through maternity homes, paediatric clinics, privately owned local and chain hospitals. With the support of Government run programs and local entrepreneurs, we aim to target non-institutional births (rural) in the third year of our operations. We will expand this program to other low and low middle income countries to create a global impact in subsequent years with the help of partnerships

Portfolio

Sohum uses brainstem auditory evoked response BAER or ABR technology which is the gold standard in auditory testing and is recommended as the test of choice by the American Association of Pediatrics US and the National Health Services NHS-UK. Sohumi uses this in an innovative way with an easy-to-use interface to meet the needs of the system. As of now, this technology is prohibitively expensive and inaccessible to the underserved populations.



In India, there is a broad gap between the urban tertiary health care facilities, and the rural and the urban-poor. Taking into consideration the distinct needs and constraints faced by them, we have designed a dual pricing strategy to encourage maximum market penetration while ensuring that the business is sustainable. We have a cross-subsidy model to make the facility accessible to the rural and urban poor while ensuring that the needs of all segments of customers are served. We have two distinct product-pricing options available to the customer-

- **Sohum Sarv:** Pricing for small-scale centers and local entrepreneurs. Local entrepreneurs are general practitioners, small clinics of pediatricians or audiologists who practice independently. They may be serving the rural and the urban poor consumers
- **Sohum Pro:** Pricing for larger tertiary care centers and large maternity homes and hospitals



Commercialization Strategy

- **CE marking:** Our strategy is to go for CE mark first and then FDA 510k. Sohum is a class II-A device, non-invasive with a measuring function. We will implement plan for meeting Annex-I and Annex-IV requirements. Verification and validation will be performed for design control. Safety, EMC, FMEA and bio-compatibility tests will be performed
- **Clinical trials:** We will be carrying out a multi-center comparative clinical trials with predicate diagnostic ABR devices to establish its efficacy
- **Marketing, implementation and scaling:** We aim to reach a very large number of babies. This needs rapid scaling and national - international network building. Our strategy is to collaborate with the right partners in India private and public and other developing countries. We will focus on both private paediatricians, maternity homes collaborating with neonatal product companies for distribution in India and public setups State government vaccination programs, NRHM, National Deafness Prevention Program and vaccination programs to reach the babies born in a non-institutional setting. We shall use cross-subsidizing business model to provide an affordable price to consumers in the last mile. We need to engage local entrepreneurs and general practitioners to use the device in their own village cluster. We need to find partners who adapt and use already existing Government run vaccination programs to access the last mile. Many state governments in India have established schemes for mother and child welfare

Mentors

Dr Paul Yock, Professor Bioengineering, Stanford Biodesign, Stanford University, Dr. Vinny Bhutani, Professor of Pediatrics (Neonatology), Stanford University, Dr Vinod K Paul, Head, Department of Paediatrics, AIIMS, New Delhi, Dr Alok Thakar- Professor, ENT department, AIIMS, New Delhi, Dr Raj Doshi, Consulting professor, Medical device design and entrepreneurship, Stanford University, Dr Uday N. Kumar: Cardiac electro physiologist, Founder iRhythm technologies Inc., San Francisco and Sashi Kumar, Managing director, Phoenix Medical Systems, Chennai

Critical Areas for Mentorship

Regulatory, clinical trials and scaling, marketing and implementation

Funding Mobilized

Rs. 35 lakhs from Grand Challenges Canada, Rs. 32 lakhs from Center for Innovation in Global Health, Rs. 44 lakhs



from DBT – BIRAC (BIG) and Rs. 70 lakhs from DBT – BIRAC (IIPME grant cum loan)

Support from State

National Health Systems Resource Centre selected the device in their Healthcare Technology Assessment, Ministry of Health & Family Welfare

Achievements

- Sohum Innovation has won many laurels- a testimony of the dire need for such devices in developing nations such as India.
- NASSCOM ICT led Social Innovation in Healthcare Award, 2015
- Indian Merchant Chamber Social Inclusion Award, 2015
- Sankalp Social Innovation Award, 2016
- Top 35 startups to visit the Silicon Valley with the PM of India, 2017

Entrepreneurial Journey - Nutshell

Currently, the Sohum device is installed in five hospitals – two in Bengaluru, one in Manipal and two in Guatemala (Central America) and 175 successful tests have been conducted. By end of this year, we aim to reach 100 clinics and screen close to 20000 babies

Lessons from the Journey

- Follow the process: The core learning from the Stanford India Biodesign program is to choose the need carefully analyzing the market impact, social impact and clinical impact.
- Lean management: We need to follow lean management practices and should utilize the resources on most essential requirements and tasks of the project.
- Team first: Need to have a strong team to execute the project and should recruit them with lot of care



Road Ahead

Sohum will be standard of care in maternity homes, paediatrician clinics and hospitals to screen newborn for hearing loss in India. Sohum has the potential to create global impact by screening millions of babies in all middle-income and low-income countries. We will be scaling in different regions and economies with the help of local partners and organizations

Advice for Budding Entrepreneurs

- Plan for your activities and imagine the worst case scenario
- One needs to keep planning even when things are not working out
- We need to have a backup plan to keep running the core of activities of the project
- There is always a delay in getting funds so plan to have a safety net in such situations. Survival is the key.



Unilumen Photonics Pvt. Ltd.

Founders: Anil Prabhakar, Balaji Srinivasan and Krishna Kumar

Year of Establishment: 2012

Location: IIT Madras Bioincubator, IIT Madras Research Park, Chennai Tamil Nadu and Cybercity, Hyderabad, Telangana

Annual Turnover: Rs. 30 lakhs (average)

Team Members: 6

Area: Medical Devices



Academic Background

Anil and Balaji are both doctorates. Krishnakumar has a Master's degree. All three obtained their highest education in USA.

Motivation to Pursue Entrepreneurship

Absence of laser manufacturing companies in India, and poor penetration of lasers in healthcare was the key motivation. There is a poor penetration of lasers in the Indian market. As we attempt to provide better healthcare to our ageing population, importance of a robust ecosystem to deliver and support lasers becomes important. The societal benefits of having indigenous healthcare technology is what motivated us to pursue entrepreneurship



Identification of Business Opportunity

Conversations with doctors led to the identification of business opportunity

Product in the Pipeline

Surgical robotics with integrated lasers

100W, 1um pulsed fibre laser for cell ablation is currently under beta testing at a customer site. 1W green continuous wave laser is under alpha testing, and 1 um picosecond pulsed laser is under development

Commercialization Strategy

We are engaging with hospitals for pre-clinical trials. We are also diversifying into using lasers for non-invasive applications such as optofluidic systems for optoporation and fluorescence detection

Mentors

IITM Incubation Cell

Critical Areas for Mentorship

Product certification, raising finance, marketing and sales



Funding Mobilized

Rs. 50 lakhs from DBT-BIRAC (BIG), Rs. 50 lakhs from DBT-BIRAC (BIPP) and Rs. 2 crores from private funding

Achievements

Unilumen Photonics is currently valued at Rs. 6.5 crores. It is in talks to become a wholly owned subsidiary of Jiva Sciences Pvt. Ltd.

Entrepreneurial Journey - Nutshell

Our first product was a green laser designed for prostate surgery. We were able to showcase this product and engage with Aurolabs (Arvind Eye), Madurai for design of green lasers for retinal surgery, and simultaneously began engaging with LV Prasad Eye Institute (Hyd) on development of pico-second lasers for cataract surgery. The ability to pivot the business and use the fibre lasers as a general platform for all healthcare applications is essential to surviving as a startup

Lessons from the Journey

Hiring good employees is one of the biggest challenges for any startup, next only to raising funds. An incubation facility of an academic institution which is close by is helpful. The support they provide during the early stages helps overcome many hurdles. However, it is also important to move away from incubation cells and begin to operate independently. Overdependence on the incubating environment causes delays in schedules and laxity in operations. Having experienced this for three years, in our fourth year of operations, we moved production to Hyderabad and retained only new product development in Chennai. This separation will allow us to focus on present production, continue with R&D for new product development. As a side benefit, we will also be able to showcase both facilities and qualify for DSIR certification



Road Ahead

The healthcare division of Unilumen Photonics will become a part of a larger healthcare company that has expertise and requirement in other healthcare platforms such as surgical robotics and lab-on-chip diagnostics

Advice for Budding Entrepreneurs

Entrepreneurship is not for the weak-hearted. Rather than jumping into it immediately after college, it will be useful to gain some industrial experience for 2-3 years. This will immediately add value to your company both in setting up business processes, and also while raising investments. People invest in your team, so it is important to hire talent and showcase both commitment and depth. Funding will be a challenge, so start with a solid business plan and raise sufficient capital for the first 3 years



Wrig Nanosystems Pvt. Ltd.

Founders: Ambar Srivastava

Year of Establishment: 2009

Location: New Delhi

Annual Turnover: Rs. 1.2 crores (2016-17)

Team Members: 60

Area: Molecular Diagnostics



Academic Background

Ambar is a dual degree (bachelors & masters) graduate in Biochemical Engineering and Biotechnology from IIT Delhi

Motivation to Pursue Entrepreneurship

I was always interested in bioelectronics as this is an interdisciplinary area between electronics engineering and biotechnology. Also, had keen interest in understanding what it takes in building a new business from scratch. It became an insanely unstoppable urge to take the plunge into entrepreneurship in the area of bioelectronics the moment I saw an opportunities of hybridising my two passion areas



Identification of Business Opportunity

I identified the business opportunity by carrying out primary and secondary research



Portfolio

TrueHb Hemometer is a state of the art hemoglobin measurement device based on the principle of reflectance photometry. The device consists of a biosensor for performing accurate, high precision; rapid and convenient blood hemoglobin level estimation. It is intended for the measurement of hemoglobin in whole blood samples. Drop of blood, usually from the tip of the finger is applied to the strip, which further disperses within the hydrophilic mesh. The test strips use Imidazole MetHb method to lyse RBCs and to convert oxyhemoglobin, deoxyhemoglobin and methemoglobin into a common molecule

Commercialization Strategy

The performance evaluation study conducted at AIIMS, New Delhi validates TrueHb performance against other devices on the basis of repeatability, reproducibility and other factors. The product is in market since 2015. We are expanding rapidly in India and other countries. We are in process of getting CE/FDA approval to market the product in Europe & USA



Products in the Pipeline

KFT (kidney function test), CBC (complete blood count), glucose, HbA1c and among others

Mentors

Dr. Veena Koul and various Investors

Critical Areas for Mentorship

Team building, branding and public relations

Funding Mobilized

Rs. 80 lakhs from angel investors and \$US 2.10 million from venture capital investors

Achievements

- Received MIT Technology Review innovation award under 35 (MIT Tr35), 2013
- Product successfully commercialised and sold in 13 countries touching more than two million lives

Entrepreneurial Journey - Nutshell

My ambitions have been evolving rapidly with the success being garnered in the entrepreneurial venture. Curiosity, drive and aggression are my best tools

Lessons from the Journey

Excellent mentors are must, team building is most critical, invest in people, no ambition is too big to achieve and excellent structured lateral thinking is a must

Road Ahead

- Sales across more than 150 countries
- 7 new point of care products in market
- More than 10k global team size
- Revenue at least over US\$ 1 billion



Advice for Budding Entrepreneurs

- Find great mentors who can teach you about team building for tech & business, branding & sales, public relations and legal
- Work with startups to learn the inner workings
- Think about inventing a new and useful product or a business idea by –
 - Test the novelty and usefulness very honestly
 - Make sure the addressable market size of the business is massive
 - Even before building the product or service sell it to few people to receive genuine feedback.

BIO
AGRICULTURE



Aeka Biochemicals Pvt. Ltd.

Founder: Aardra Chandra Mouli

Year of Establishment: 2014

Location: Thiruvananthapuram, Kerala

Annual Turnover: Rs. 17 lakhs (2015-16)

Team Members: 6

Area: Agri-Microbiology and Environmental Biotechnology



Academic Background

Aadra is B.Tech in biotechnology and biochemical engineering from University of Kerala and M.Sc in management from Warwick Business School, UK

Motivation to Pursue Entrepreneurship

I always wanted to start an enterprise of my own. I have been passionate about nature and environmental sciences since childhood. After completing my bachelors in biotechnology and biochemical engineering, the idea of starting a biotech venture took shape in my mind and once I returned to India after my masters, I started Aeka



Identification of Business Opportunity

The “human footprint” on the environment, and current state of affairs in relation to the quality of air, water, soil and ecology, along with the urgent need for viable, easy-to-use, effective green solutions for basic environmental problems gave me the impetus to start an environmental biotech start-up. My company focuses on developing and providing environmental solutions useful for industries as well as the common man



Portfolio

Aeka's first range of products - Sasya range of microbial plant growth promoters, is a series of microbial consortia of selected species of naturally occurring soil microorganisms developed and tailored towards the needs of different scales and types of farming. The range consists of the following products, each being specially formulated and tested for specific target crops and modes of application:

- Sasya Sutra - for nursery and garden use, via seed and root treatment
- Sasya Mitra - for kitchen, home or terrace gardens, and small farms, via foliar application
- Sasya Raksha - for gardens, and farms, via foliar application
- Sasya Poshak - large farms, via seed, root and foliar application
- Sasya Poshak+ - plantations, via seed, root and foliar application



We also launched fifteen new agri-microbiology products in January 2017 for promoting growth of flowering plants, vegetable crops, fruiting plants, cereals and pulses.

Commercialization Strategy

We retail several ranges of agri-microbiology products

Products in the Pipeline

Water and plastic remediation research

Mentors

Dr. V. Padmanabhan Potty (Principal Scientist (Retd.) CEPC Laboratory and Technical Division); Dr. P.G. Latha (Director (Retd.), JNTBGRI); Dr. Achuthsanker S. Nair (B. HOD, Dept. of Computational Biology & Bioinformatics, University of Kerala and Member, State Biodiversity Board)

Critical Areas for Mentorship

Product development and optimisation

Funding Mobilized

Rs. 31 lakhs from company funds (capital) and Rs. 14 lakhs loan from Kerala Financial Corporation under KSEDMD scheme

Support from State

Interest subsidy for term loan

Achievements

- First fully women-owned biotech and biochemical company in Kerala
- Recognised by the Government of India under the Start-Up India Initiative
- Selected by the Department of Biotechnology (DBT) of the Government of India to participate in BIO International Convention, at San Diego, California, 2017
- Awarded Kairali Innotech Award for Best Non-IT Start-Up, 2016
- Awarded the New Indian Express Devi Awards, 2016
- Awarded Professionals' Conclave Women Entrepreneur Award, 2016
- Awarded RED Shakti Award for Women, RED FM, 2017
- Featured in SchweizerRadioundFernsehen (Swiss Broadcasting Corporation), India Today, CNN News 18, CNBC Awaaz, YourStory.in, Malayala Manorama, Mathrubhumi, The Hindu, The New Indian Express, the Deccan Chronicle, Destination Kerala, Yo! Success, EnteCity, Dhanam, TEDx (speaker)

Entrepreneurial Journey - Nutshell

Aeka is a fully women-owned biotech and biochemical start-up venture based out of Trivandrum, Kerala, India. Aeka has its laboratory and small-scale production unit at Vazhuthacaud, Trivandrum that is eco-friendly, pollutant-free, and zero-effluent zone. Aeka has an all-women scientific team. We have successfully brought to market twenty products till date, which have received very positive reviews and high levels of customer satisfaction. The broader goal of the company is to also help in establishing and developing a Trivandrum and Kerala as strong biotech and bio-related industrial centres



Lessons from the Journey

Any research-oriented company that has to be set up needs careful planning, meticulous understanding of the workflow and envisioned activities for the first 2-3 years, along with equipment and resources needed for entrepreneurship. Setting up a biotech company in Kerala had several additional challenges, including the dearth of detailed information regarding the legal and regulatory processes to be carried



out and the licenses to be obtained. At times, a one-size-fits-all approach did not take into consideration the distinctive nature of the activities of a biotech and biochemical company. Most people were of the opinion that we were stacking the odds against ourselves, starting our company in Kerala, where the domain of biotech is not as well-established as in cities such as Bangalore and Hyderabad. But it turned out to be an advantage, since it means that Aeka can do something different, try out innovative ideas, and forge its own path. The support for biotech start-up has also increased significantly in the past two years, with the support of the central and state Governments. Aeka is well on its way to establishing itself not only as the first fully women-owned biotech company in Kerala, but also as a first mover in its field in the state

Road Ahead

We plan to successfully keep bringing to market green solutions for use in water treatment, and innovative products in our agri-microbiology range

Advice for Budding Entrepreneurs

- Find and follow your passion; it is what will keep you going through tough times
- Entrepreneurship, just like life, has ups and downs. There will be issues that seem insurmountable, but if we keep doing what needs to be done, and keep trying to find a way under, over, around or through a problem, we will definitely be able to find a solution
- Have a support system you can depend on, be it friends, family, books, pets, teammates or colleagues. This will help you relax, recharge and refresh yourself when you need it. Have faith in yourself.



Biogram Agro Solution and Research Institution

Founder: Puneet Kumar Verma

Year of Establishment: 2016

Location: Shyampur, Sehore, Madhya Pradesh

Annual Turnover: Rs. 2.5 lakhs (2016-17)

Team Members: 5

Area: Agriculture Inputs



Academic Background

Puneet is a post-graduate in Biotechnology

Motivation to Pursue Entrepreneurship

My motivation to pursue entrepreneurship has been to do something worthwhile for the farmers of our nation and contribute to the Indian economy through agricultural produce.

Identification of Business Opportunity

I decided to pursue this business opportunity as nowadays no one wishes to pursue agriculture as a career option. Biogram Agro was started to promote eco-friendly practices in order to replace chemical and bio-hazardous material from soil and make agriculture safe and profitable with socially and environmentally responsible approach



Portfolio

Products

- Liquid Fertilizers
 - Biogram KPS PSB Organic Fertilizer
 - Biogram KPS RHIZO Fertilizer
 - Biogram KPS PSB Fertilizer
 - Biogram KPS Azospi Fertilizer
 - Biogram KPS Microbooster fertilizer
 - Biogram KPS Azoto fertilizer
- Bio Fertilizers
 - Organic Vermi Compost
 - Biogram KPS Consortia
 - Enriched Vermicompost with Earthworms
- Organic Cereals and Pulses

Services

- We teach farmers the benefits of Soil Health by guiding them towards balanced use of the fertilizers recommended using soil test on macro & micro level testing



- We also provide advance agriculture consultancy to the farmers

Commercialization Strategy

Our marketing strategy is spreading the word about our products and guiding farmers towards adapting organic fertilizers and compost. This will help in reducing the pollution caused due to the use of chemical substances. Biogram Agro is seeking marketing partners and industries for funding to commercialize products on a larger scale

Products in the Pipeline

There are products in the pipeline which can be added along with vermicompost for enhancing organic farming.

Mentor

Dr. S. K. Rao

Critical Areas for Mentorship

Use of technology in enhancing agricultural productivity

Funding Mobilized

Funds from personal savings

Entrepreneurial Journey - Nutshell

BioGram Agro Solution and Research Institution is leading manufacturing unit of Bio-fertilizer & Organic fertilizer in central state of India. Our vision is innovating best in technology with tag line “Samradhi Kisaan Ki Vikas Desh ka”. BARI was started to deal with agriculture development projects specifically for the development of organic farming in India & the world with aiming the healthier world by using biotechnology. We are aiming to raise the life standards of our nation and its farmers by awakening them towards using biotechnology to improve their way of farming by incorporating natural resources in organic farming. We sensitize the farmers about the merits of organic farming, biofertilizers, biopesticides and demerits of chemical fertilizers and pesticides.

Achievements

- Biogram Agro has certification from NCOF (National Centre Of Organic Farming), Directorate of Farmer Welfare And Agriculture Development, Madhya Pradesh
- We have motivated hundreds of farmers to adopt biofertilizers

Lessons from the Journey

There have been lot of challenges due to lack of knowledge in use of biotechnology for agriculture, lack of awareness amongst farmers, etc. Also, we faced problems in availing bank loan as the bank personnel felt that entrepreneurial venture with biofertilizers did not great returns. We hope to prove them wrong

Road Ahead

We aim to become India’s top company in biofertilizers and organic farming

Advice for Budding Entrepreneurs

- Should be confident to achieve their goals them
- They may face many problems but should have faith in themselves.





Enzys Govindji Bio Labs Pvt. Ltd.

Founder: Amit Kumar Rai

Year of Establishment: 2015

Location: Indian Agricultural Research Institute, Pusa Campus, New Delhi

Annual Turnover: Rs. 21 lakhs (average)

Team Members: 2

Area: Plant Tissue Culture



Academic Background

Amit is M.Sc in biotechnology from VBSB University, Jaunpur, Ph.D in plant biotechnology from NRCPB and PGDBM in marketing

Identification of Business Opportunity

My family has been serving the farmers of Bihar since more than last 50 years through our family run nursery at Garhara in District Begusarai, Bihar. The nursery was started by Late Shri Jai Govind Rai who was a freedom fighter and worked with Mahatma Gandhi in Gramodyog and Khadi movements in the pre-independence India. Through the nursery, he distributed new varieties of fruits and vegetable plants for cultivation by Bihar farmers. Currently, we provide modern varieties of plants to farmers. There is a need for tissue culture raised plants for modern agriculture to enable profitable hi-tech farming by utilizing micro-propagation technology



Portfolio

- Tissue culture raised disease free plants of crops such as banana, potato tubers, chrysanthemum, gerbera and ornamental plants
- Disease free quality planting material of various horticultural crops:
 - Chrysanthemum: product launched in market in 2017
 - Banana: protocol under optimization
 - Potato: protocol under optimization
 - Gerbera: protocol under optimization
 - Foliage ornamental plants: protocol under optimization

Commercialization Strategy

All products under optimization and development would be launched and marketed in 2018 in different districts of Bihar. After achieving success in Bihar, marketing activities would be expanded in North Eastern states. Optimization and development of mother culture for tissue culture plants like banana, syngonium and mini rubber is completed and ready for commercial production. We have carried out extensive research to optimize the protocol and have now been able to successfully develop mother culture for these plants. We are in the process of setting up the facility for scaling up the production to achieve a commercially sustainable target of 2.5 million plants per year. Based on work carried out in the previous year and ongoing efforts, we would be ready to launch our product in the market very soon



Products in the Pipeline

Easy to use tools for pathogen detection & management in plants, consultancy and professional training for farmers: Hi-tech horticulture, protected cultivation, commercial horticulture, modern agricultural practices, molecular diagnostics for plant and human diseases and production of enzymes (Taq, Restriction Endonucleases)

Mentors

ZTM-BPD Unit, IARI, Pusa, New Delhi

Critical Areas for Mentorship

Business planning and raising funds

Funding Mobilized

Rs. 6.25 lakhs from MSME and Rs. 10 lakhs from personal savings

Support from State

Recognized under Startup India scheme

Achievements

- Established mother plants for micro-propagation
- Protocol optimization for commercial production of different plants
- Establishment of hardening facilities

Entrepreneurial Journey - Nutshell

We are involved in enabling hi-tech cultivation of floriculture and horticulture crops of modern and high-yielding disease free varieties through high-quality planting material for commercial farming

Lessons from the Journey

Mobilisation of funds needs the primary attention before starting any venture

Road Ahead

We aim to serve the farmers through different technological applications. We want to become the one stop solution provider for all agricultural purpose needs so as to bring prosperity among poor farmers. In next five years, company would work to attain annual turnover of Rs. 100 crores



Advice for Budding Entrepreneurs

- Precision in Identification of business idea
- Market Research
- Proper Business Plan Development
- Funding opportunities & ways to obtain them
- Focus on providing superior products and services, success will automatically follow.



FIB-SOL Life Technologies Pvt. Ltd.

Founders: S.Kavitha and Anant Raheja

Year of Establishment: 2013

Location: IITM Bio-Incubator, IIT Madras Research Park, Chennai, Tamil Nadu

Annual Turnover: Rs. 15 lakhs (FY 2015-16)

Team Members: 6

Area: Agricultural Inputs



Academic Background

Kavitha is M.Sc in medical biochemistry from JIPMER, Pondicherry and Ph.D in biotechnology from IIT Madras and Anant is M.Sc in microbiology from University of Pune and Ph.D in biotechnology from IIT Madras

Motivation to Pursue Entrepreneurship

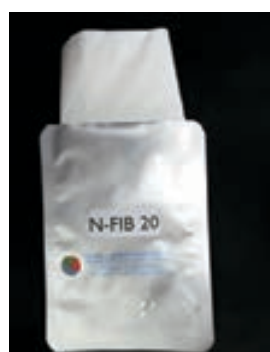
Our motivation has been to create jobs in the biotechnology sector and promote eco-friendly way of living by using technologies in biotechnology

Identification of Business Opportunity

Organic farming is a demand of our times, owing to detrimental effects of inorganic agricultural inputs. The existing organic inputs especially biofertilizers are bulkier and not efficient; hence we decided to develop a stable nanofiber carrier for agriculturally important microbes. Biofertilizer market is estimated to be \$US10 billion



Portfolio



Our product is a Biofertilizer carrying membrane named FCM (Fertilizer carrying membrane). The FCM hosts a high pay load of cells 1011cfu/g (100 Billion cells/gram) reducing bulkiness of the carrier material by 100 times and makes our product 1000 times lighter than existing products. The process of making the fibers preserves the cells in a stable condition, on exposure to adverse climatic conditions. This in turn preserves the efficacy and activity of the product till it reaches the field. It fixes the required amount of nitrogen for plants and is 100% eco-friendly and safe. It leaves no undesirable residues in the soil unlike currently available biofertilizers. The product is easy to apply through existing irrigation portals and cuts costs on manpower needed for application. The process is well optimized and the technology provides scope of expanding the product portfolio as to other plant growth promoters, bio-pesticides etc.

Commercialization Strategy

The first product NFIB20 was marketed to beta clients in October 2016. We plan to collaborate with leading biofertilizer manufacturing units for integration our technology with their existing facilities and commercialization through their distribution channels. We aim to raise investments to build our in-house facility and manufacture the products while facilitate marketing through major players



Products in Pipeline

- FCM hosting Phosphate Solubilizers
- FCM hosting Potassium mobilizers
- FCM hosting Biopesticides
- FCM hosting bioactives in Panchagavya and Amirthakaraaisal
- Sensitised nanomembranes, which in turn will recruit beneficial bacteria to the rhizosphere on application

Mentors

Prof. T.S. Chandra -Department of Biotechnology IIT Madras, Prof. T.S. Natarajan -Department of Physics IIT Thirupathi and Mr. M.M. Murugappan -Vice-Chairman Murugappa Board

Critical Areas for Mentorship

Strategies for marketing the product and financial planning to raise investments

Funding Mobilized

Rs. 10 lakhs from IITM Alumni Network, Rs. 20 lakhs from DBT-BIRAC (SBIRI), Rs. 12 lakhs from Shri. MMMuthiah Research foundation, Rs. 6.25 lakhs from MSME and Rs. 25 lakhs from IITM Incubation CellLoan

Achievements

- Won the LIFT India Ideation Series conducted by Swissnex and represented India in the Lift Prototype lab in Geneva, 2017
- Won 'Cavinkare-MMA Chinnikrishnan' award
- Qualified for the Open Innovation challenge of IIGP 2.0 and awarded seed funding support of Rs. 25 lakhs
- Cofounders' core patent on using nanofibers for entrapment of microbes was selected for the Sir J C Bose Patent Award from IIT Madras, July 2017





Entrepreneurial Journey - Nutshell

The company was started with a seed fund of Rs. 10 lakhs from the IITM alumni association and has come long way since then. The product idea emerged from a simple left out experiment from Anant's PhD. The prototype has been developed and tested for commercial feasibility. Field trials of the product have been initiated with leading organic corporate plantations. As a team, FIB-SOL, has managed to raise funds of Rs. 80 lakhs through various Government funding agencies. We are currently in the pre-revenue stage and looking for investments to scale up operations and for commercialization

Lessons from the Journey

The initial challenge was to understand the ways of an independent start-up, quite a new thing for seasoned researchers. We had to shelve a lot of our ideas to focus on a few, rather than get distracted. Further, it was difficult to manage with limited resources. Anant even had to take up a consultancy job in order to manage his finances to prevent burning out the small investment. Later, we stabilized on receiving more funds in 2015

Road Ahead

In the next five years, we hope that we shall have our large manufacturing facility in 1,20,000 acres. We are planning to expand our product portfolio to other crop growth promoting formulations and biopesticides. We see ourselves as a leading agricultural input company in the country. We also aspire to provide services in the agricultural and nanofiber sector

Advice for Budding Entrepreneurs

All entrepreneurs share common qualities and attitudes undeniably. However, an entrepreneur in a life science sector should be able to persevere. This quality will help him overcome the uncertainties in a biology related product development. He/she should be passionate towards the technology that in turn would convince the investors to be part of the venture. Entrepreneur should also have the ability to change course when things are not falling in place and should not be obsessed with the technology. At the end of the day a life science start-up is a risky one and we know it. But on the other side, success in life science sector would mean a lot to the entrepreneur as well as the society, as most of the solutions offered by biotech start-ups have huge societal impact.



Green Agri Biotech Pvt. Ltd.

Founder: Abhijit Saikia

Year of Establishment: 2013

Location: Moran, Dibrugarh

Annual Turnover: Rs. 6 - 7 lakhs (average)

Team Member: 1

Area: Agricultural Inputs



Academic Background

Abhijit is M.Sc Biotechnology from Dibrugarh University, Dibrugarh

Motivation to Pursue Entrepreneurship

I have been motivated to start my venture as I always wanted to create a brand of my own and work for the society

Identification of Business Opportunity

Being from agricultural background, I wanted to reduce the tremendous use of chemicals and make the farming community aware of organic practice

Portfolio

- Biofertilizers: Azotobacter, Azospirillum, Phosphate solubilising bacteria (PSB),
- Potash mobilising bacteria (PMB), Rhizobium
- Biocontrol agents: Pseudomonas fluorescence, Trichoderma viride, Trichoderma harzanium
- Biopesticides: Mitec, Helofite, Biocare
- Pheromones: cue lure, methyl eugenol, leucinodes, helioverpa, scripblend

All the products are in the market, but the demand for organic product in market is very less. People are still unaware of the side effects of chemical pesticides. It is unfortunate that Government is not making any big progress in promoting organic farming

Commercialization Strategy

We are working on creating awareness among the farmers on benefits of organic practice and holding demonstration to advertise various products

Mentor

Dr. D. J Nath, Senior Scientist, Assam Agriculture University, Jorhat

Critical Areas for Mentorship

Soil science



Funding Mobilized

Funds from Central Bank of India and NABARD

Achievements

- Incubation at Biotech Hub, IIT Guwahati
- Incubation at Centre for Tea and Agro Studies, Dibrugarh University
- Regular supplier for Agricultural Department, Government of Assam for biofertilizers and biopesticides

Entrepreneurial Journey - Nutshell

There have been lot of obstructions and hardship in every step but we have remained focused and positive

Lessons from the Journey

Once you decide to be an entrepreneur, you will have to be prepared for every hardship and situation. Initially, every step will be a challenge but once into it, there will always a way

Road Ahead

We wish to become one of the leading and prominent brands for bioagricultural products. We have recently signed a MoU with Dibrugarh University for lab space as an incubatee and research work to be carried out under guidance of experts



Advice for Budding Entrepreneurs

- There is success in every field of life, only if we work with full dedication and effort
- Nothing can be achieved in a short time, so never give up.



Revelations Biotech Pvt. Ltd.

Founder: Ravi Chandra Beeram

Year of Establishment: Karyotica Biologicals Pvt Ltd (KBPL) is 100% subsidiary of Revelations Biotech Pvt Ltd (RBPL); 2008 (RBPL), KBPL (2012)

Location: Hyderabad, Telangana

Annual Turnover: Rs. 1.75 crores (RBPL) and Rs. 6.50 crores (KBPL)

Team Members: 70

Area: Animal Nutrition



Academic Background

Ravi is Gold Medallist in B.Sc in agriculture from Gujarat Agricultural University, M.Sc in genetics from Chaudhary Charan Singh Haryana Agricultural University, Hisar and Ph.D in structural biology from International Centre for Genetic Engineering And Biotechnology, New Delhi

Motivation to Pursue Entrepreneurship

I firmly believed that translation of science needs entrepreneurial avenues. Coming from a farming family venturing into entrepreneurship was not easy. However a strong urge to harness the science for meeting the societal needs is the ultimate motivation towards entrepreneurial journey



Identification of Business Opportunity

I failed in identifying the real opportunity when I started off my journey. One needs to leave behind the academic mind-set behind and get into the shoes of a real entrepreneur. In academic view point every piece of science is an exciting opportunity. However, building a sustainable enterprise needs a little detached approach towards science. I started off with a highly complex genetic engineering based project which eventually remained as just an academic subject. Loss of time and money taught me to identify the opportunities within my limitations. I started looking at the opportunities in a business perspective and science as mere path to find the solutions. Eventually a huge opportunity in animal nutrition was identified. I believed that productivity of livestock can be improved by enzymes and started working in the lab giving ourselves three years of time. We had a clear business plan and estimates of what we need. We have eventually achieved what we have aimed for.



Portfolio

We have developed enzyme based solution for increasing the productivity in dairy cattle in terms of milk yield and quality while improving the animal health. We have also developed various solutions for increasing the productivity in aquaculture and poultry.

Karyolact™, Karyomax™, Karyomax™+, Karyovir™, Viracle™, Karyogeo, Karyoblast™, Karyocee™, Karyoxy™, Karyomycis™, Karyogrow™



Launched since March, 2017: Thermostable Amylase, Invertase, Various probiotics (Bacillus subtilis, Bacillus megaterium, Bacillus pumilis, Bacillus licheniformis, Saccharomyces boulardii, Pediococcus acidilactici)

Commercialization Strategy

A comprehensive marketing plan is in place for mass commercialization of Karyolact. National Dairy Research Institute (NDRI) has evaluated Karyolact and reported 13% increase in productivity of dairy cattle. Karnataka Milk Federation conducted trials with Karyolact and approved the product in rate contract. Coromandel International Limited signed an agreement to market Karyolact and other products through their “Mana Gromor” stores (about 650 stores) which are in the service of farmers by selling quality farm inputs. We have produced multiple television commercials in Telugu and Gujarati to educate farmers and to reach out through media. We are negotiating with various state governments to offer Karyolact through their animal husbandry departments

Products in the Pipeline

CalB, Penicillin G Amidase, Lactoperoxidase, Serratia peptidase. We have started work on creating novel process for manufacturing of human insulin

Critical Areas for Mentorship

Planning and defining a product by just scientific merit is not enough. Mentors should be able to define product features in light of a particular market, time period and should be able to help in preparing comprehensive production, financial and marketing plan

Funding Mobilized

Personal savings, grants from DBT, MSME, and seed fund from DST helped initially. After 2011, borrowing from friends and private equity was critical in establishing the venture

Support from State

Our products are VAT exempted

Achievements

- Created a differentiated and proven product for increasing the milk yield, milk fat%, SNF% and overall health of the cattle for which there is about USD 2 Billion market in India alone
- Created a differentiated and proven products for increasing the growth rate and decreasing the FCR in shrimp and fish
- Created a differentiated and proven product for controlling white gut disease in shrimp
- Created a differentiated and proven product for increasing growth and decreasing FCR in poultry
- A turnover of Rs. 6.5 crores in the first year of sales
- Funding Rs. 5 crores to DDRC, THSTI, Faridabad on PPP mode for R&D

Entrepreneurial Journey - Nutshell

After short stint as protein crystallographer in a drug discovery organization in Bangalore, I set up Revelations biotech towards the end of 2008 with the aim of providing innovative biotechnological solutions in food industry using genomics and proteomics. However, the project ended as mere technical consultancy service. I was keen on developing solutions which can be commercialized quickly. We believed that novel solutions in molecular diagnostics can put us in business. Some space was hired for lab in Life Science Incubator, IKP Knowledge Park, Hyderabad in 2009. Eventually with the help from friends and from personal savings a lab was set up. We were able to win a grant from BIRAC for the diagnostics project in 2011. We established proof-of-concept but sensitivity



of the solution developed was low and commercially non-relevant. We received another grant from BIRAC in 2011 for another project on a biosimilar. However, one of the partners of the second project has withdrawn and there was lot of uncertainty about the second project. Hence, we had to abort the project.

By 2012, we had exhausted all our funds and nothing was achieved. We needed a product at the earliest to sustain the company. We realized that there is not even single enzyme manufacturer in Hyderabad. Most of the people were buying enzymes from China and their efficacy in livestock formulations was not greatly appreciated. We began developing proteases and amylases to begin with. We shifted the lab focus completely from genetic engineering to microbiology. We floated an enzyme manufacturing company Karyotica Biologicals in a small industrial shed in Cherlapally industrial area with minimal infrastructure. After several attempts we could make amylase for the first time in bulk and were ready to sell in 2013. Marketing was much bigger challenge for us compared to research and production. We started generating some revenue by the sale of enzymes and were able to sustain as a company. By 2014 we had about 20 different enzymes under mass production. Our products started showing phenomenal increase in productivity in aquaculture, dairy cattle and poultry. We did conduct extensive field evaluations by collaborating with various ICAR institutes and dairies. In 2016 we had investors to fuel our marketing. Our flagship products Karyolact™ and Karyomax™ were able to increase productivity up to 20% in dairy cattle and aquaculture respectively while improving the health of the animals. We had good market response in coastal Andhra Pradesh in 2016 and our products were well received in the market. We shall be rapidly expanding all over the country in next two years. We stated investing in creating novel products and more intensive research programs through PPP modes with DBT and ICAR organizations

Lessons from the Journey

Science is always exciting and knowing how people have used science for the prosperity of human race is even more exciting. Knowing science makes a person only scientist or academician. Knowing science, people's needs, value of time, resources, finances and market makes a person a scientific entrepreneur. Scientific entrepreneurship is a continuous learning process and experience of each person is different. It may be important to understand that one individual may not bring all the needed expertise to an organization. Therefore teams of people having both scientific and entrepreneurial experience would have more chances of being successful. It is important to understand that scientific ventures do not take predicted path and to "fail early" and "fail safe" is as good as success

Road Ahead

We are looking to expand our presence all over the country in next two years and go global in next five years. We are targeting at least three to five fold increase in our revenues in next couple of years. Our products have been evaluated by some of the big marketing partners and we are about sign marketing agreements in next couple of months. We would be ideally expecting to reach Rs. 100 crore mark in next five years

Advice for Budding Entrepreneurs

- Do not start an enterprise because you have one great scientific idea.
- Team of people with science and business experience will stand more chances of success
- Incremental innovation is a not bad start- Do not crave for disruptive innovation to begin with
- Educational qualifications do not mean much even in scientific innovation
- Losing money and time is normal in scientific entrepreneurship. That does not mean that you have failed. It is just a fee you pay for success in future.
- Do not lose hope.



Robust Herbals Pvt. Ltd.

Founders: H. Mallesha and K.R. Ravikumar

Year of Establishment: 2010

Location: Bengaluru, Karnataka

Annual Turnover: Rs. 2 – 3 lakhs (average)

Team Members: 3

Area: Healthcare and Bioservices



Academic Background

Mallesha is M.Sc. in Chemistry, M.Phil, Ph.D in Chemistry from University of Mysore and Postdoctoral fellowship from Japan. Ravikumar is M.Sc in Chemistry and Ph.D in Chemistry from University of Mysore and Postdoctoral fellowship from USA

Motivation to Pursue Entrepreneurship

The motivation behind pursuing entrepreneurship was-

- To use knowledge and skill for making an impact on the field of science and take a hold of things ourselves
- To develop unique products for the market so as to meet the needs of the scientific community and reach sectors via the provided services
- To empower the students and guide them through their course. This will help to motivate them and lead them towards research and development



Identification of Business Opportunity

Through innovation and networking with a great range of population in the scientific community, we concluded that there is a great need of services and products in healthcare

Portfolio

- Personal care products made from herbal extracts
- Healthcare products like herbal solutions to fight against asthma, diabetes, cancer, etc.
- Training and mind transformation programmes to generate enthusiasm among students

Commercialization Strategy

It is important to create your own outlet through your start up idea and be able to successfully encompass the research and products. We strive to establish valuable scientific data for each product up to the clinical trials in the market.



Products in the Pipeline

Bio-availability enhancement in existing drugs

Mentor

Dr. A.S. Radhakrishna

Critical Areas for Mentorship

Business innovation is the key for the success for any venture to be successful

Funding Mobilized

Funds from founder capital, product sales and training

Achievements

Robust has developed 10-12 herbal products

Entrepreneurial Journey - Nutshell

It takes the right mind to come up with an idea, but to nurture it one needs the right guidance and support from the team. The idea needs to be financially empowering for it to lead to a fruitful stage.

Lessons from the Journey

Sustainable development of any venture requires correct marketing and strategy. One thing which is very essential in this is the marketing of the product or services which you offer. Impromptu decisions might often lead to blunders

Road Ahead

We aim to reach a stage where we are able to generate Rs. 2 crores as annual turnover

Advice for Budding Entrepreneurs

Focus and market innovation are important for sustainable success.





Sushila Biofertilizer Company Pvt. Ltd.

Founder: Brijesh Kumar Yadav

Year of Establishment: 2010

Location: Jaunpur, Uttar Pradesh

Annual Turnover: Rs. 18 lakhs (average)

Team Members: 12

Area: Agricultural Inputs



Academic Background

Brijesh is M.Tech in biotechnology and is currently pursuing his Ph.D

Motivation to pursue Entrepreneurship

"Annadata" are the farmers who feed the nation, often do not get the best financial return from farming therefore organic farming is the only ways where they can improve own financial status. Other major problem in our country is unemployment, I strongly believe that providing an employment opportunity to young generation rather than doing job. I believe in the motto - "A long cherished dream of agri-tech firm is now reality, now the need is to nourish it"



Identification of Business Opportunity

I was born to a family with agriculture background; my grandparents owned a large agricultural land near Jaunpur. During my school days, I used to wonder why my home state Uttar Pradesh consistently came up among the most populated states in India. The answer was clear; our state has been bestowed with a highly fertile flood-plain provided by river Ganga and its tributaries. While this is a great boon, farmers often are seen at the mercy of nature. Also, number of people opting farming are dwindling. This fact used to disturb my mind that the farmer who feeds the nation is often not able to get the best support back. While deciding on a career option, I opted for agriculture-oriented one because not only I am passionate about it but I realized that the future holds a lot of challenges and lot of potential in the agri-sector. I did my graduation in Biotechnology from Agriculture Institute, Allahabad where I was introduced to the modern methods of scientific agriculture.

I learnt that while green revolution was indeed a great merit for our nation, the rampant use of chemical fertilizers has created problems, especially in the fertile flood plains. Too much use of the fertilizers has now started reducing soil quality which shall be a big problem in the near future. New generation farming technologies like organic farming and biofertilizers soon became areas of interest for me. In order to learn the modern eco-friendly techniques in farming, I joined VIT University, Tamil Nadu for post-graduation from with internship for a year from Diamantina Institute-The University of Queensland, Australia. I grasped the modern methods in biotechnology during my very fruitful stay at VIT. It is here that I had the idea of starting a firm, which is focused on providing sustainable agriculture solutions to the farmers in India. As I did not have the experience or requisite technology, I postponed the idea for my cherished dream.

After post-graduation I joined as a research student initially at CCMB and then later at CDFD, Hyderabad. The main aim was to gain exposure to biotechnological methods, which in addition also brought me laurels in the form of international research papers and also I had the opportunity to be selected for scientific paper presentation at the Medical University of Innsbruck, Austria. After more than 3 years in the academia and gaining sufficient hands on experience, I revived my old dream by starting a biofertilizer production company with the brand



name “SuBiCo”. I had immense support from my family and hence money was not a major problem. I got the technological assistance from National Centre for Organic Farming (NCOF) Ghaziabad for installing the facility. SuBiCo is now a small scale industry which received partial financial assistance from Ministry of Agriculture & Farmers Welfare, Government of India. However, this is just the beginning. My dream is to make SuBiCo the leading provider of cost effective, sustainable agriculture solutions not just to UP, but to India and later even to the world. When I participated in a workshop on “Bio-entrepreneurship and Bio-enterprise Creation” organized by BCIL in September 2016, I listened to the inspiring stories of other entrepreneurs in the field. It was impressive and I felt the need to be more competitive and the need to dream even bigger. Through this workshop, I got a lot of information that would help me especially with the management. Additionally, I got seeds of a few ideas, which I would sure develop in near future

Portfolio

Manufacturing of bio-fertilizers, micronutrients and vermicompost

Products in Pipeline

Tissue culture, to development of soil testing kit and mushroom production

Funding Mobilized

Loan From Union Bank of India and received partial financial assistance from Ministry of Agriculture & Farmers Welfare, Government of India

Support from state

Tax exempted on biofertilizers

Achievements

- Successful launch of new efficient biofertilizers, micronutrients & vermicompost
- Received partial financial assistance from Ministry of Agriculture & Farmers Welfare, Government of India
- Received third prize on exhibition of biofertilizer in Kisan Mela organized by Department of agriculture at district level, 2015

Entrepreneurial Journey - Nutshell

With high motivation and vision, company was established in 2010. From that time onwards, many successful new products have been launched, many collaboration have been built with research institutes and universities. Additional new and efficient products are in pipeline. Beside production emphasis have been given in research pertaining to understanding soil health, variety of crops, time for cropping and other associated physical parameters

Lessons from the Journey

To introduce new products from a newly launched company was very challenging. However, with strong pursuance and determination we have been to establish our presence in the market with our products. The sensitization meetings and one-to-one interactions with farmers has helped us greatly

Road Ahead

We plan to launch more cost-effective biofertilizers, soil testing kit, micronutrients and vermicompost for different type of soil

Advice for Budding Entrepreneurs

- Determination, sincerity and hard work are very necessary
- Sensitization meetings and personal interactions with stakeholders especially farmers is important.





The Unati Cooperative Marketing-cum-Processing Society Limited

Founders: Jyoti Saroop, Kamal Netar, Sandeep Sharma, Kiran Saini, Amarjeet Bajwa and Rajni Sharma

Year of Establishment: 2003

Location: Hoshiarpur, Punjab

Annual Turnover: Rs. 12 crores (FY 2015-16)

Team Members: 14

Sector: Food Processing



Academic Background

Biotechnology, soil sciences and agronomy

Motivation to Pursue Entrepreneurship

We were motivated to start our venture so that we could work for our own people instead of looking for jobs in our country or abroad. Love for homeland also encouraged us to pursue this venture

Identification of the Business Opportunity

All co-founders are residents of lower Shiwalik belt of Punjab called Kandi Area. This area of Punjab was neglected during green revolution but it is very rich in natural bioresources. Unati studied and analysed the strength of these bioresources and planned to use these bioresources as a tool for livelihood generation for community



Portfolio

Processing of fruits, vegetables and herbs for nutraceutical products. Our main product category are :

- Healthcare juices like amla, bittergourd, jamun, aloe vera and giloye tulsi
- Naturally fermented vinegars like apple, amla and jamun
- Organic certified herbal powders and tea
- Health foods like preserves, fruit barfi and candied fruit

Mentors

Punjab State Council for Science and Technology (PSCST)

Critical Areas for Mentorship

Providing platform and resources to execute vision of the startup



Funding Mobilized

Rs. 37.4 lakhs from the Department of Biotechnology through PSCST

Achievements

- Unati has been able to transform a small rural development project to a successful business model where livelihood generation science and technology blended for holistic growth of society
- Generating income of more than Rs 3.0 crores to local community and around Rs 1.0 crores to government in form of various taxes from the bioresources which were going waste
- 100 % self-sustainable journey without any direct government financial aid, subsidy and bank loan
- Modern infrastructure facility with capacity to handle 2500 MT bioresources per annum
- Unati Manufacturing facility holds ISO 22000:2005, HACCP, Halal, and Organic (as per India USDA & Euro organic) certifications
- Largest manufacturer of naturally fermented vinegars and first to have organic certified vinegars in India



Entrepreneurial Journey - Nutshell

Unati is a group of young, dynamic, innovative and enterprising people working with a shared vision of integration of rural community for sustainable agriculture development and natural bioresources management in Kandi Area. Unati started well in year 2003 with three major objectives of -

- Natural bioresources management
- Cultivation of medicinal & aromatic plants
- Processing and marketing of produce of kandi

In our objective of natural bioresources management, we started with wild amla which is abundantly available in Kandi area and going waste in our jungles without any use. Under Unati, we selected one village Palli in Talwara, formed a group of local women and unemployed youth for collection of amla fruit from jungle. With some initial teething problems, concept worked well and society processed 11,000 kg of fresh amla and got 1900 kg of dry amla which was sold in the market @ Rs 45/kg and generated the income to the whole group. The activity gave us the encouragement to establish a post-harvest management facility for amla.

Simultaneously, one group of Unati started work in medicinal and aromatic plants (MAPs) and selected some MAPs which could be introduced in Kandi belt. The oil extraction unit of lemongrass has been established in village Hajipur. Unati also tried to introduce other crops like Kaunch Beej (*Muccena pruriens*), kalmeg (*Andrographis paniculata*), geranium, citronella etc. but most of these crops were not successful in area due to one or another reasons.

The manufacturing facility established by PSCST under DBT project was fully handed over to Unati in year 2007 to run it on self-sustainable basis. The facility taken over by Unati was small manufacturing unit with basic plant and machinery to process around 2-3 MT of various Bioresources per day. In mission mode efforts Unati successfully utilized this platform and transformed it to a facility with modern infrastructure and generating annual turn over of RS 15.0 crores (Rs 150 M) this year. Unati is total self-sustainable project with backend network of more



than 400 community members and big brands like Apollo Pharmacy, Medplus Pharmacy, Healthkart.com, Goderj Natures Basket, and many more in our client basket. Unati also exports to Europe, US, Canada and Dubai.

In year 2012, PSCST and Punjab Agriculture University gave us technology of naturally fermented vinegars. Unati provided the platform to scale up these naturally fermented vinegars from sugarcane, apple, jamun and amla. Unati developed own low cost fermenters to successfully scale up the natural vinegar production to more than 3 lac litre in year 2016-17. All the major clients in India sell Apple cider Vinegar, Jamun Vinegar manufactured by Unati. As apple cider vinegar is the major product in demand, Unati has carried out backward integration of apple farmers in Rampur area of Himachal Pradesh for collection of quality apples. Unati is first in India to have organic certified apple cider and Jamun Vinegar

Other new initiatives of Unati are around jaggery and bamboo. Beside Unati run social programs for cleanliness, women empowerment and skill development

Lessons from the Journey

The first challenge for us was to gain the confidence of the local community because they were the real workforce who would be working at the backend operations. We adopted a modified model of ITC e-chaupal to connect with the local community. Our story of 100 % self-sustainability is because our collectors and farmers provided financial support to us in terms of raw materials. In initial phase, we worked under severe financial crunch. To manage this, low cost alternatives were developed in place of high cost options available. Most of the plant and machinery in the Unati unit is customized as per our needs. When our production capacity increased around 20 times in a decade, we easily accommodated the increase in scale without any external finances

The other challenge was the marketing of the products. Initially, there were no takers for our products because of high cost though best quality. Unati then approached big brands like Apollo, Medplus, etc. to market our products under their brand names. Now, Unati is one of the major service providers for private label of herbal nutraceuticals to most of the major brands in this segment

Road Ahead

Unati is a platform where any technology meant for livelihood generation, nutrition and health will be scaled up to achieve holistic goal of healthy and wealthy society. We foresee the growth of Unati in nutraceutical segment with turnover of more than Rs. 100 cores by the year 2020

Advice for Budding Entrepreneurs

When we work selflessly and patiently, positivity and success will follow. The major contribution to your success is your willpower to work in odd conditions and to achieve these tools – meditation and faith in oneself and almighty may be beneficial.



BIO INDUSTRY



Adhita Biosciences Pvt. Ltd.

Founders: Nishi Vivek Morya and Vivek Kumar Morya

Year of Establishment: 2015

Location: Biotech Park, Lucknow, Uttar Pradesh

Annual Turnover: Rs. 9 lakhs (average)

No. of Team Members: 12

Area: Personal Care Products



Academic Background

Nishi is Masters in applied microbiology, Ph.D from Central Drug Research Institute and Post-Doctoral fellow of Hanyang University, South Korea and Vivek is Ph.D from DDU Gorakhpur University and Post-Doctoral fellow of Inha University

Motivation to Pursue Entrepreneurship

From our perspective, startup offers “Freedom” for crafting a business by own, chances to work how we want. It gives us flexibility to work according to our convenience. Other people can see your ideas through your services and products. Though we have undergone ups and downs in our journey for which we are only responsible, but we will love working for our own venture



Identification of Business Opportunity

Cosmeceutical industry has grown in popularity with consumers over the past 10 years. In 2016, the global skin care market was estimated to be worth about \$US 121 billion. The flourishing worldwide market for natural skin care has revealed that users are keen to move away from chemical cosmetic ingredients and seek a natural alternative. During our stay in Korea, we realised that Korean cosmetics are one of the best cosmetics in the world. We realised that India has wide-range of floral diversity which can be explored using the existing knowledge written in ancient books as well as current research carried out using emerging and environmental friendly technologies. My husband having several years of experience in cosmetic research is an added advantage

Portfolio

- Plant-based novel spray mosquito repellent - It is handy and developed keeping in view the difficulties faced in using coils and balm
- Herbal lip moisturizing balm – It is available in three flavors. All colors are extracted from herbs - lemon crush, berry lush and litchi blush
- Herbal body spray - It contains a unique blend of essential oils. Their fragrance is mild and long lasting

Commercialization Strategy

Adhita is planning to launch their products in the market by December 2017. We are working on some strategies for its product commercialization:

- Packing of the products shall be attractive
- Plan to sell some products together in a set.
- Attend trade shows & different types of expos



- Use social media for contacting the potential customers
- Contacting cosmetic companies and professionals to use these products
- Host a media conference to discuss the products
- Free samples of the products to be distributed among potential customers

Critical Areas for Mentorship

Managing capital, executing plans on time and marketing of products

Funding Mobilized

Funds from private investors as well as personal savings

Achievements

- Developed prototype of herbal mosquito repellent and face pack
- Covered in an article on “Woman entrepreneur develops plant-based mosquito repellent” in the newspaper “The Pioneer”
- Signed MoU as research collaborator with Ggenex, Pune, Luminous Biosciences Inc, Rockville, USA and Greeneasy Co. Ltd. South Korea
- Received ISO 9001:2008 certification
- Published two book chapters on “Use of micro algae as fish feed and its use in sustainable development” in NEVA publication USA, and “Thermodynamic Consideration in Protein Engineering” in Kalyani publication house, India.

Entrepreneurial Journey - Nutshell

Adhita was registered just 1.5 years ago. Adhita is taking leadership position in using state of the art technology to provide the highest quality research based start up business, with a focus on development of target specific cosmeceuticals/ Nutraceuticals and Biosimilar screening and evaluation

Lessons from the Journey

As a femme Entrepreneur, I feel that India especially Uttar Pradesh is notoriously difficult place to do business. However if we get local help, it really helps in opening the door of big success of our venture. In case of Adhita, Biotech Park (one of the Incubator Centers in UP) provided an opportunity to us

Road Ahead

Adhita plans to develop and market cosmetic intermediates; diagnostic, plant extracts microbial proteins and metabolites, pharmaceutical and life sciences products and services to Medical laboratories, pharma companies and research institutions. We will also conduct research on herbal pharmaceutical products with aim to develop and market pharmaceutical/ cosmetics products for related industries. Adhita plans to expand to over 50 employees by 2020, which will provide jobs to B.Sc., M.Sc. and PhD students



Advice for Budding Entrepreneurs

Every budding entrepreneur knows the key to success that is “hard work, team spirit, continuous focus on goal, etc”. However, if an entrepreneur ensures that he/she does not succumb to the “Valley of Death” for their startups, it would be like double insurance for their dream project and ultimately would enhance the possibility of their goal to reaching fruition.



Krya Solutions Pvt. Ltd.

Founders: Preethi Sukumaran and Srinivas Krishnaswamy

Year of Establishment: 2010

Location: Golden Jubilee Biotech Park for Women, Chennai

Annual Turnover: Rs. 1 crore (average)

Team Members: 15

Area: Personal Care Products



Academic Background

Preethi is B.Sc in zoology from Stella Maris College, Chennai and PGDM from IIM Kolkata and Srinivas is M.Sc in physics from IIT Madras and PGDM from IIM Bangalore

Motivation to Pursue Entrepreneurship

Our initial work experience was in global FMCG brands in sales and marketing roles, which gave us expertise in consumer products. However we have always believed in leading a environmentally sustainable life, using herbs and organic produce and in traditional Indian scientific knowledge especially Yoga & Ayurveda. After a few years of working in these MNCs, we felt a strong urge to lead a life congruent with our personal ideas and beliefs. Krya was born as a result of this reflective process where we have synthesised our principles, our business training in building brands and our ideas on sustainable urban living



Identification of Business Opportunity

In 2009, when we quit our jobs to create our own business, we wanted to build on our ideas and our prior expertise. Then and now, there are few options for genuinely natural skin care products and home-cleaning products based on sound first principles derived from Indian Systems of medicine. This presented a tremendous opportunity to provide Indian customers with safe, natural and effective alternatives to the toxic, chemical everyday products like detergent, soaps and liquid shampoos

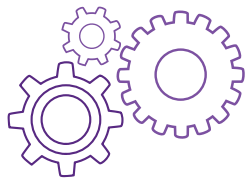
Portfolio

100% natural, plant-based , personal care & home cleaning products, all sold under the “Krya” brand name

- Home Cleaning : Detergent, Dish-wash , Hand-Wash



- Skin care
 - A range of face-wash powders (classic, moisture +, anti-acne, after-sun , for men)
 - A range of body-wash powders & ubtans for women, men, babies and kids
 - A range of Hair-oils (classic, extra-conditioning, anti-dandruff, damage repair, anti-lice, intense)



- A range of Hair-wash powders (classic, extra-conditioning, anti-dandruff, damage repair, anti-lice, intense)
- A range of special skin & hair care powders specially formulated for babies (0-1 years), toddlers (1 -3 years) and kids (3+ years)

Products in the Pipeline

Krya natural Hair-Color system

Mentors

None

Funding Mobilized

Rs. 85 lakhs sourced from personal savings, bank loan and partial-subsidy under PMEGP scheme of KVIC

Achievements

The creation of over 60 proprietary formulations in our categories that have won wide acclaim with a spectrum of consumers across India who now trust Krya for personal care products for the entire family

Entrepreneurial Journey - Nutshell

The success has been in establishing the idea that it is possible to create 100% plant-based , safe, natural products for skin & home care that are also effective, and available consistently through-out the year for the customers. Krya provides a complete alternative to the toxic and chemical options which are widely sold today across the world

Lessons from the Journey

- Setting up a stable, cost-effective supply chain to ensure that we meet demand throughout the year was a big challenge as all our raw materials are agricultural produce or forest-collected and therefore have only seasonal availability
- Building the expertise to create products that are 100% natural and don't have a single chemical filler, preservative or fragrance was a technical challenge, which we overcame by the application of Ayurvedic First Principles
- Building a brand that consumers can trust and growing the business without spending on advertising was a big challenge, which we overcame through our blog and Facebook page to create traction for our e-commerce business. Further growth came through the strongly positive word-of-mouth from satisfied customers

Road Ahead

Scaling up our initial success to create a powerful brand (in our categories) that families can rely upon to provide safe, sustainable, effective products for every-day use in the home. To create at least 100 new jobs through our company and to create a business with strong growth that will help create several more in-direct jobs for our suppliers like farmers of organic herbs and forest-collectors of wild herbs

Advice for Budding Entrepreneurs

- It is really important to have a great co-founder in the business, entrepreneurship can be lonely at times
- Always be focussed on bringing in sales (and later on cash-flow as well) despite the hundreds of day-to-day operational tasks that present themselves
- Enjoy the process of building a great business and learn to love what you do (as opposed to doing what you love).



Sea6 Energy Pvt. Ltd.

Founders: ShrikumarSuryanarayan, Sowmya Lakshmi Balendiran, Nelson Vadassery, Sayash Kumar and Sri Sailaja Nori

Year of Establishment: 2010

Location: C-CAMP, Bengaluru, Karnataka

Annual Turnover: Rs. 7.35 crores (2016-17)

Team Members: 35

Area: Algal Biotechnology



Academic Background

Shrikumar is B.Tech in chemical engineering from IIT Madras and M.Tech in biochemical engineering from IIT Delhi; Sowmya Lakshmi Balendiran is B.Tech in biotechnology from SVCE and has been part of EPYP (Executive Program for Young Professionals), IIM Calcutta; Nelson Vadassery is B.Tech and M.Tech (dual degree) biotechnology from IIT Madras; Sri Sailaja Nori is B.Tech and M.Tech (dual degree) biotechnology from IIT Madras; Sayash Kumar is B.Tech and M.Tech (dual degree) biotechnology from IIT Madras



Motivation to Pursue Entrepreneurship

The motivation to create sustainable and innovative solutions for the energy needs of India inspired us to pursue entrepreneurship and create Sea6 Energy in 2010

Identification of Business Opportunity

Seaweeds (Macroalgae) are one of the fastest growing plants in the world, which stimulated the idea of using their components to improve terrestrial plant growth. The initial work carried out in collaboration with University of Agricultural Sciences, Bangalore played a key role towards the product development and the business opportunity to improve agricultural productivity in India was thus born



Portfolio

- Jingo NXG (marketed via Mahindra Agri Solutions Ltd)
- AgroGain (marketed by Sea6 Energy)

Our agricultural biostimulant product, Jingo, has been commercialized in 2015 and an enhanced version of the product, Jingo NXG was commercialized in 2016 by Mahindra & Mahindra's Agri arm - Mahindra Agri Solutions in India. AgroGain was commercialized through Sea6 Energy's own distribution network in 2016



Commercialization Strategy

We have already commercialized our agricultural biostimulant product in India through our marketing partner (Mahindra Agri Solutions as Jingo NXG) and through our own distribution network as AgroGain. We are actively looking for partnerships to commercialize this product overseas

Products in the Pipeline

Plant Immunity Booster product

Critical Areas for Mentorship

Raising funding; team building; legal aspects and IP and compliances and regulatory affairs

Funding Mobilized

Sea6 Energy's initial funding has been through the IIT Madras Alumni network, angel investors and government funding (DBT - BIRAC). Sea6 Energy has raised funding from Tata Capital Innovations Fund in FY 2015-16

Achievements

- Awarded the "Emerging company of the year" in Bio-industrial category by the Government of Karnataka at the Bangalore India Bio, 2012
- Sea6 Energy has applied for 5 patents in the field of seaweed farming and processing. One of the patents has been granted in 2016
- Over 5 lakh farmers have used our biostimulant product till date
- Jingo NXG has been shortlisted in the finalists under the category of "Best new biological product" globally at the Agrow Awards, 2017

Entrepreneurial Journey - Nutshell

The cofounding team of Sea6 Energy i.e the undergraduate students of Department of Biotechnology, IIT Madras and visiting professor, Shrikumar Suryanarayan of Department of Biotechnology, IIT Madras came together in 2008. Over cups of afternoon coffee, we set out to innovate a scalable solution for India in the area of renewable fuels – since India imports nearly 80% of its liquid fuel needs. Sea6 Energy happened almost accidentally in 2010.

Our idea was to carry out large-scale agriculture on the sea using sea-plants to produce enough marine biomass that could be converted to Biofuel. Producing biofuel this way, instead of diverting land based agriculture biomass would not impact the food and feed supply chain – a real issue for India given its huge population, food needs and limited arable land. The challenge however, was, that there was no technology or knowhow either to carry out large scale sea agriculture or to convert the resulting marine biomass to fuel.

The company got started in the campus of IIT-Madras. Laboratory space and office space were made available with the help of supportive faculty of the department of Biotechnology. This foundational help was very crucial for Sea6 in its early years and we remain grateful for this. We received our first funding from BIRAC under the BIPP scheme shortly thereafter. This funding boosted our ability to pursue our bold ideas. Our presence at the IIT Madras campus enabled us to interact with different disciplines of engineering there and helped us attract a lot of diverse talent into our company.

In 2012, Sea6 moved from the campus of IIT Madras to the first DBT/ BIRAC funded Biotech incubator, C-CAMP, in Bangalore. By 2014, our company had demonstrated technical feasibility of producing Biofuel from seaweed. Location of C-CAMP within a cluster of academic institutions including the University of Agricultural Sciences was the very key to our company's ability to innovate other new products for use in agriculture based on seaplants.

In collaboration with Mahindra and Mahindra, Sea6 Energy launched an agricultural bio stimulant, Jingo in 2015



and two new products, Jingo-NXG and Agrogain were launched in 2016. Bio stimulants are a new class of natural products which can stimulate plant growth and increase crop yields by as much as 20%. Importantly for Sea6, a revenue source from Bio stimulant sales is helping us to build a stable and profitable business while we continue to pursue our longer term goals of renewable energy and other products from sea plant biomass.

The journey towards creating a Biotech company starting from the lab and going out into the market in the Indian context has been exciting and full of learning. Overall, it is important to see one's day-to-day work in a larger context that is meaningful and empowering. That's when a company and the people it is made up of get a feeling of achievement and progress. That's what makes an entrepreneurial journey interesting and exciting!

Lessons from the Journey

As a company, we learned that it is important to stay flexible and grounded and be open to market opportunities and fall back options wherever possible. The ability to pivot, i.e change track and move towards the final goal is quite important, as ideas may not always work out as we have planned them



Road Ahead

Sea6 Energy aims to expand to be a 100 crore plus company within the next five years. We aim to achieve this by producing a large variety of renewable chemicals/products from seaweed and expanding to various geographies around the world. We would scale up Ocean Farming technology for cultivation of seaweed and set up a demonstration pilot plant for biofuel production. All of these goals would be achieved by building an empowered and excited team of people

Advice for Budding Entrepreneurs

- You need to collaborate wherever possible and access the best expertise, don't try to do everything yourself
- Contextualizing what you are doing now as a part of the larger vision is important, this ensures your past effort is not wasted
- You need a great team and you need to empower them! A great team helps you think and strategize on the fly, but always be aware of the company's bandwidth to handle various issues
- Plan for raising money 12 months before you actually need it
- Commercializing new technology or new product is hard. Do not underestimate the time and the resources required to do so
- Do not be afraid to fail. The ability to "pivot" i.e change track and keep moving towards the goal is important, because ideas may not work out the way we planned them
- It is important to enjoy the journey – while driving to the destination



Venketesh Biosciences LLP

Founders: Raghav Garodia and Prateek Maheshwari

Year of Establishment: 2016

Location: Ranchi, Jharkhand and Hyderabad, Telangana

Annual Turnover: Early commercialization phase

Team Members: 8

Area: Nutraceuticals



Academic Background

Raghav is B.Tech in Biotechnology from Amity University, Noida and Masters in biotechnology from University of Melbourne and Prateek is B.Tech in Biotechnology from Amity University, Noida

Motivation to Pursue Entrepreneurship

While growing up, we learnt that biotechnology has great scope and future. We were excited with the research opportunities various sub-fields of biotechnology could offer. But during our undergraduate studies, a harsh reality hit us. Most of the research is aimed at paper publication, poster presentation, academia recognition, etc. Also, commercialization of science in this field is extremely limited in India primarily due to limited industry-academia relationship and extremely limited focus on commercialization of innovation (long gestation period). As a result, job opportunities also were limited and the students in college were not taught how to innovate but how to secure some job i.e. most students were trained for IT companies although being biotech graduates). This did not bode well with our ambitions and mentality.

We had the zeal to create opportunities rather than scraping for opportunities in the over-competitive market. We discussed business possibilities back then and were in constant look out for an idea that can be successfully implemented and followed with our limited resources and capabilities. Entrepreneurship was a need we identified for our personal gratification and a way via which we can contribute to the society and the nation. Entrepreneurship gives us an opportunity to make a difference and try to create a legacy for ourselves

Identification of Business Opportunity

During our undergraduate and post-graduate studies, we were working with algae technology and bioprocess engineering. This helped us in understanding the products and possibilities via algae and other microbes. Overall, we realized that we can have sustainable production of a particular group of compounds called “Omega 3-Fatty Acids” especially Docosahexaenoic Acid (DHA). DHA supplementation is important in a vegetarian-heavy and non-fish eating country like India. In order to understand the potential market and scope, we visited 10th Nutra India Summit 2015 and iPEX 2016 both at Mumbai. We were aiming at setting up fermentation unit for DHA oil production and selling raw material.

When we met Mr. CM Reddy, President & CSO, Genomlabs Bio Pvt Ltd and discussed the idea, he advised us to focus on value added products than just the material. Most of the companies seem to ape the West in nutrition and preventive healthcare whereas we strive to develop products that would suit the Indian consumer mentality. We took the idea forward and focused on DHA and allied products to be consumed by vegetarians and vegans. We also aimed to break the monopoly of DSM Martek for premium microencapsulated powder used by a lot of companies



to enrich their products with DHA. We identified Indian Nutraceutical Market that is still in its infancy to put India on world nutrition map and make premium Indian manufactured products

Portfolio

- Vegetarian microencapsulated 10% DHA powder
- Vegetarian DHA-Probiotic Drink/Stick Pack (Fruit Flavours)
- Vegetarian DHA Drink Powder: Flavoured (Fruit Flavours)
- Vegetarian DHA enriched Gummies (Fruit Flavours)

Our product expansion plans include -

- Vertically: different variants like flavours, slight compositional changes, etc. to already existing products and new outlets to existing products
- Horizontally: new formulations based on combination of effects of different nutrients targeted specifically for segments like joint pain, pregnancy, lactation, dementia, etc.

Commercialization Strategy

Our commercialization strategy is to introduce the product in the market through pharmaceutical and nutrition companies with business to business (B2B) approach and negotiation with sales & distribution dealers

Products in the Pipeline

- Vegetarian Microencapsulated 20% DHA powder
- Vegetarian DHA softgel
- Vegetarian DHA enriched formulations targeting different specific segments

Mentor

Mr. CM Reddy, President & CSO, Genomlabs Bio Pvt Ltd

Critical Areas for Mentorship

Dealing with business related issues, placing the product in the market, negotiation better deals and creating the brand image and credibility in a market that is very tightly knit and 'Indian Manufactured' is not favorably appreciated

Funding Mobilized

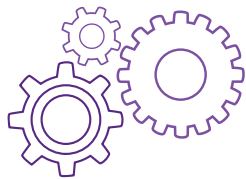
Bootstrapped (personal savings and borrowings)

Achievements

- Trademark for Microencapsulated DHA as "Swasth DHA"
- Cleared pre-incubation for the first batch of NEXUS (American incubator) in New Delhi
- Recognized by DIPP under Startup India Initiative

Entrepreneurial Journey - Nutshell

We haven't started commercial production yet but trial samples (non-commercial samples) have been sent to few potential clients. We are being appreciated for our methodology and products. Though there have been lots of ups and downs during product developments, we believe in not being disheartened and keep focusing on the long-term objective. We got Startup India recognized by DIPP in 2016 but didn't receive much benefits from it except



for networking with fellow startups and a platform to discuss the issues. We were also top among the 9 companies selected by Government of Jharkhand to exhibit at Start-up Pavilion at Global Investor Summit Jharkhand 2016 that connected us to local startup ecosystem and help us discuss the pitfalls we should try to avoid

Lessons from the Journey

Entrepreneurship is not for everyone. It is a long process and requires lot of patience. We learnt that nothing is set in stone and everything is fluid. We have to constantly adapt and evolve. We learnt not to expect anything from any one even if it is your Government but to develop plans based on your capabilities and after thorough evaluation of all the possible variables. There is no set protocol or formula for success. Also, we learnt it is not just about the idea but what we do with the idea and how do we implement it. There have been several roadblocks at personal level, market level, limitations with resources, etc. but there is always a way around it. We need to be patient to find the way around the issues and not to constantly dwell and be overwhelmed by it. We realized that focus is the key learning



Road Ahead

We hope to expand our product portfolio with setting up a fermentation unit for production of DHA oil. We hope to create awareness with DHA and related products and also expand to different other active ingredients

Advice for Budding Entrepreneurs

- If entrepreneurship is the path you choose, make sure you work where your passion lies. There is almost no glamour associated with it until we make it really big and the journey requires immense sacrifice especially at personal front at times
- We should never be disheartened, if one idea doesn't work, we learn from it and the next idea might
- Also, it takes in a lot of personal effort, as an entrepreneur we need to do almost each every aspect of the enterprise personally. The key is to find the right balance between outsourcing some work, doing things personally and micromanaging activities
- With respect to startups, we learnt that startup is just a term and we shouldn't dwell on it. We should treat it as conventional business with the objective of profitability and sustainable growth
- Valuation and funds would automatically come if the idea is sufficiently translated into a business.





BIO

SERVICES



Affigenix Biosolutions Pvt. Ltd.

Founders: Arumugam Muruganandam, Sambandham Venkatesan and Radhaselvi Venkatesan

Year of Establishment: 2012

Location: Siruseri IT Park, Chennai, Tamil Nadu

Annual Turnover: Rs. 1.7 crores (average)

Team Members: 12

Area: Customized Bioanalytical Products



Academic Background

Radhaselvi is M.S in electronics and communication from University of Windsor and Arumugam is Ph.D from University of Windsor

Motivation to Pursue Entrepreneurship

We wanted to be independent and follow our passion to discover and develop novel drugs and biomarkers

Identification of Business Opportunity

We have the experience and expertise in the niche area of assay development

Portfolio

We provide customized immuno and molecular assay development services to our biopharmaceuticals clients. Our in-house impurity clearance assay and other 32 bioanalytical and bioassay products are in the market since 2014

Commercialization Strategy

Our niche B2B products are being sold directly to biopharmaceutical companies in India. For reaching out to global players, we are trying to establish contacts through social media and exhibits in conferences

Products in the Pipeline

10 immunoassay products

Mentor

Mr. Venkatesan

Critical Areas for Mentorship

Mainly in the backend operations – marketing and raising and managing funds

Funding Mobilized

Rs. 8 crores

Achievements

- 32 products launched, 2 papers published & 1 patent filed





- DBT-BIRAC-BIG 3 Award for Developing PAN reactive Trypsin resistant antibodies
- DST-Lockheed Martin-FICCI -IIGP 2014 Top 30 Innovators Award for innovating Companion Diagnostics for Diabetes Management
- BIRAC Fellowship 2015 Ignite Program at- University of Cambridge, UK
- CAMTech Diabetes Hack-a-thon runner up for Insulinator bag
- Villgro's Impact-a-preneur Quest award-UTI
- Healiat award for Glycated albumin measurement technology, 2016
- KBITS Bio excellence award, 2016
- ICMR-Invite to Rashtrapathi Bhavan -top 40 innovations
- Biotech exhibition -Tokyo sponsored by Government of Karnataka
- Emerging Bioservice company of the year by ABLE, 2015 - 16
- Grand Challenges India (finalist), 2016

Entrepreneurial Journey - Nutshell

After studying and working in Canada and USA for 20 years, Arumugam moved to India in 2008 and joined R&D division of Biocon. In November 2012, after a successful and satisfying career at Biocon, Muruganandam voluntarily resigned from Biocon and joined Affigenix Biosolutions Pvt Ltd in Dec 2012; establishing R&D unit in Bangalore in 2013 with the help of family funds. At present Affigenix's scientific team of 12 scientists are working on several niche products and biosolutions and provide contract services for biopharmaceutical companies. We follow various ICH, FDA, EMA, Indian guidelines in developing custom immuno, molecular and cell based assays for biopharmaceutical companies. From year 2014, Affigenix has started generating revenues and we are adding and retaining customers on a monthly basis. We serve very niche market and understand scaling up is going to be slow due to small number of customer base. In addition adopting to the Business to Business model (B2B) and growing through R&D, we are in the process of venturing into Business to Customer model (B2C) to serve diagnostics (patients) and agro industries (farmers)

Lessons from the Journey

Finding a place to set up the company was a big challenge. Quality product and service should not be compromised

Road Ahead

We want be recognized as a premier service provider and also to be recognized for our inventions and innovations in the area of life-sciences

Advice for Budding Entrepreneurs

- Aim for the moon, even if you miss it you will be among the stars
- Million will make millions but first million is tough, don't give up and give your best
- Don't spread your resources too thin, be flexible, but try to remain focused
- Don't be overconfident and believe that you can do all yourself.



Bioklone Biotech Pvt. Ltd.

Founders: K. Rajeshwari and T. Venkataramani

Year of Establishment: 2013 (Bioklone was a proprietary firm between 2006-2013 and was incorporated in 2013)

Location: Golden Jubilee Biotech Park for Women, Chennai, Tamil Nadu

Annual Turnover: Rs. 85 Lakhs (average)

Team Members: 15

Area: Customised Molecular Biology Products



Academic Background

Rajeshwari is Ph.D in biochemistry and Venkataramani is M.E in electronics & telecommunications and MBA

Motivation to Pursue Entrepreneurship

Our motivation has been to provide quality and timely import substitute antibody services to life-sciences community

Identification of Business Opportunity

Close interactions with the scientists and research students in IISc and TIFR helped us understand the actual antibody needs of researchers and the practical problems faced by them due to non-availability of reliable and timely supplies of customized and commercial antibodies. This gap in the demand and timely supply of high quality and cost-effective antibodies was the major driving force behind the inception of the firm

Portfolio

- Customized monoclonal and polyclonal antibody services
- Assay development services
- Protein purification services
- Hybridoma banking services
- Biotech training for students

Products in the Pipeline

Development of antibodies for diagnostic applications such as infectious diseases and tumors

Funding Mobilized

Rs. 60 lakhs from personal savings

Achievements

- Nearly 100% client retention and consistent repeat orders
- Contribution of Bioklone has been cited in several





international publications.

- Entrepreneurship Development Institute of India (EDII), Gujarat under the aegis of Department of Science & Technology published Dr. Rajeshwari's case study in the science and technology space of a book entitled "The Innovators-Stories of Hi-tech Entrepreneurs"

Entrepreneurial Journey - Nutshell

Customer base is satisfied because of our interactive approach, cost effective and time-bound delivery of quality services. Expanding our clientele is backed by an excellent team

Lessons from the Journey

Winning the confidence of researchers was a big challenge as it is difficult to break the mind-set. However, our focus on quality, cost and timely deliveries have helped us win the confidence of the researches in the life-sciences community

Road Ahead

We aim to be a leading player in the antibody market catering to the diagnostics and pharmaceutical industry as well as to the research and academic institutions



Advice for Budding Entrepreneurs

It is not that somebody is born as an entrepreneur. Entrepreneurial bug can bite anyone at any point in time. If one has the right passion, courage, motivation and will power, I think they are on track. With proactive attitude and a strong support system there is nothing to stop an aspiring entrepreneur from becoming one. It is only a question of time. Stay the course and actively search for that opportune moment. While there are advantages in being an entrepreneur such as no boss, no time constraint, absolute freedom, etc., all of these come at a big cost. The price to be paid to experience this freedom is the discipline that every entrepreneur has to bring to themselves. One has to be highly self-motivated and highly self-disciplined to be successful in an entrepreneurial career.



BioSakshat Inc.

Founders: P. Kolekar, P. Panigrahi, P. Joshi

H. Chheda, and R. Pradhan

Year of Establishment: 2012

Location: Pune, Maharashtra

Annual Turnover: Rs. 5 lakhs (average)

Team Members: 5

Area: Human Resource Development



Academic Background

P. Kolekar, P. Panigrahi and H. Chheda are M.Sc and Ph.D in Bioinformatics and P Joshi and R. Pradhan are M.Sc and Ph.D in Biotechnology

Motivation to Pursue Entrepreneurship

We were motivated to start an entrepreneurial venture in order to empower education and research in life-sciences

Identifications of Business Opportunity

After series of interactions with students, research scholars and faculty members, we identified the need and opportunity to build a platform to cater services to career aspirants in life-sciences through workshop-based trainings, career counselling and scientific networking

Portfolio

Services: Workshops, career guidance, scientific networking, research assistance, consultancy, big data analytics services, online and offline training

Products: Software development, bioinformatics solutions in genomics, diagnostics and personalised medicine

Commercialization Strategy

We spread a word about our campaigns and services using mass email marketing, social media interactions and associateships with academic groups. We conduct online surveys and create portals for our products

Products in the Pipeline

Big data analytics in healthcare

Critical Areas for Mentorship

Idea incubation and team building

Funding Mobilized

No funding so far



Achievements

- Biotechnology Entrepreneurship Student Team (BEST) award from Department of Biotechnology (DBT), Government of India at BIOINVEST at Ahmedabad, 2010
- Paper titled as, "Academic Entrepreneurship Model to Empower Education and Research in Biotechnology: A Case Study of BioSakshat" published as part of Twelfth Biennial Conference on Entrepreneurship at EDII campus, Ahmedabad, 2017



Entrepreneurial Journey - Nutshell

BioSakshat has organized 10 national and state level workshops.

We have provided career guidance to more than 15 candidates to secure positions in academia and industry. We have also provided research assistance to Ph.D students and faculty in life-sciences. We have received encouraging feedback from students

Lessons from the Journey

- Initially we faced difficulties in finding infrastructure facilities to conduct workshops. Venture Center at NCL Innovation Park, Pune provided us E-classroom facility at affordable rates



- There is great demand for the services we offer. We plan to expand the team and build network of volunteers across India

Road Ahead

We plan to build national level network of BioSakshat to empower education research in life-sciences. We will be scaling up our operations across India without compromising quality

Advice for Budding Entrepreneurs

Having a team of like-minded people who share the same vision is very important. Build plans, do SWOT analysis, improve plans and move forward with action steps one by one. At times, things don't move at desired pace, but you must keep moving steadily without losing faith in your vision and capacities. Volunteer for the change you wish to see in the world. Nothing is impossible to a willing heart.





Genext Genomics Pvt. Ltd.

Founders: Ashwin Kashikar and Supriya

Year of Establishment: 2011

Location: Nagpur, Maharashtra

Annual Turnover: 50 lakh (average)

Team Members: 8

Area: Customized Molecular Biology Products



Academic Background

Ashwin is Ph.D in genetics from Delhi University and Supriya is M.Sc in biochemical technology from Delhi University

Motivation to Pursue Entrepreneurship

The aim to create and innovate in life science sector has motivated us towards entrepreneurship. Ravi M Kashikar who himself started a company from scratch to a well-established seed industry, has given us a lot of support and advice throughout our journey

Identification of Business Opportunity

Antibodies and Recombinant Proteins have huge demand in research and pharma companies. Looking at the current scenario in India, Majorly antibodies are being imported in India in turn significantly raising the cost. With aim to create a facility which can provide cost effective solution and reagent to scientist and companies, we identified the area and pursued towards it

Portfolio

We have developed target proteins and antibodies for therapeutic industry, we also manufacture some me too products use in molecular biology. Also, we have other contract research services to commercial projects. One of our products has been licensed to a agribiotech company

Commercialization Strategy

We are doing B2B marketing for our services and product. We are trying to work on developing business team and marketing strategy to go to the market.

Products in the Pipeline

ELISA KIT for TNF alpha, IL6 and STAT3, Lead compound in MTB drug discovery

Mentors

Dr. Taslim Arif Saiyed and Prof. M.A. Vijayalakshami





Critical Areas for Mentorship

Marketing and sales, market and pitching. As a scientist entrepreneur we often lack on these aspect.

Funding Mobilized

Rs. 50 lakhs from DBT-BIRAC (BIG), Rs. 10 lakhs from CEFIPRA, Rs. 2 crores from Venture Capital investment

Achievements

- Successfully completed BIG and would now be going to second phase of our research project on Tuberculosis
- The range of proteins and antibodies in our portfolio
- First Indian company to produce VHH molecule, a Nano-body in India against TNF alpha
- We have licensed one of our bio-pest control formulation to one of the agro company

Entrepreneurial Journey - Nutshell

Life science sector is quite challenging and risky. There were times when it was impossible to look past hurdles and move ahead, but strategising and re-strategizing has helped us grow beyond them while making our journey a learning and rewarding effort. Now, we do not look back. We have reached a point where we will deliver and grow

Lessons from the Journey

All startups have ideas and dreams to take it along but there are many hidden challenges which one has to be prepared for. Team building is the most important aspect where you need the right people around and they should understand your goal and be able to devote as much as you are giving in. This was a huge challenge especially in smaller cities where you do not have trained human resources and people do not strive for more. When we started building our team, we had to induce them with technology, enthusiasm and ownership. It was like working around all the corner of the company

Road Ahead for next five years

We have established ourselves as the quality standard for functional proteins and antibodies. Our clients are happy with our reagents and services. We see ourselves as one of the few companies in India who can compete with big multi-national companies for providing recombinant proteins and antibodies to the scientific world

Advice for Budding Entrepreneurs

- Strategies and marketing should always be in hand to hand when we innovate and develop a product. Until we reach that stage, we would not be able to reward ourselves with profits which is a huge driving factor
- If we have a high risk project which has long gestation period, we should have parallel plans to generate some funds to sustain
- It takes sleepless nights and tireless effort to find the key to success, but all in all do not lose hopes! Belief in self and keep your eyes open for opportunities.



Kaizen IP Attorneys

Founder: Nitin Sharma

Year of Establishment: 2017

Location: Mohali, Punjab

Annual Turnover: Rs. 38 lakhs (average)

Team Members: 5

Area: Intellectual Property Rights



Academic Background

Nitin is B.E. in biotechnology from Punjab University, MBA in finance from Punjab University, Chandigarh & LL.B with specialisation in IPR from MDPG Law College, MGS University

Motivation to Pursue Entrepreneurship

I always wanted to be someone who is not bound by a routine job from morning to evening. I wanted to run my own show in my own unique way and style

Identification of Business Opportunity

While working as Chairman and Managing Director of Orbit Biotech Pvt Ltd, I realised that a vacuum was present that limited the research to lab scale and ideas were not being converted to products. That was the time when I decided to quit my job and start up a new venture Kaizen IP Attorneys with the vision to facilitate patent filing and licensing of the innovations especially in the biotechnology domain



Portfolio

- Trademark filing, prosecution and litigation
- Patent filing, prosecution and litigation
- Patent analysis
- Patent licensing

Products in the Pipeline

We are in the process of associating with esteemed research and educational organisations for bridging the gap between lab research & patents



Critical Areas for Mentorship

Techno-entrepreneurs struggle with financial matters related to their ventures. Being too focused on their technical innovation and lack of skilled financial training hampers the growth of their business

Funding Mobilized

Rs. 30 lakhs from personal funds



Achievements

- Filed 13 patent applications in biotechnology in India & abroad
- Successfully steered a biotech company for 10 years as the CMD of the biotech division of Orbit Biotech. The business model of the organization was to provide quality manpower to the biotechnology industry

Entrepreneurial Journey - Nutshell

The entrepreneurial journey has been a roller coaster ride with each day bringing new challenges to face. But each day also brought new skills to acquire and polished my professional acumen. If I evaluate my financial satiation I may not be that satisfied, but on the skillset acquired, I have evolved into a better person with each passing day

Lessons from the Journey

The biggest bottleneck for SMEs is lack of a skilled and dedicated team. I also faced this challenge and high attrition rate. SMEs are usually not cash rich, so giving the best of salaries in the sector is out of question. Over the period we have optimised the talent retention plans and today our attrition rate is quite less. A strong team implies a strong organization

Road Ahead

In the next five years, I see my startup having 85% export oriented services in patents and trademarks. Our main focus shall be towards the US and European market

Advice for Budding Entrepreneurs

My advice for the budding entrepreneurs is that they should do a proper market research before entering into a particular domain. Entrepreneurs being passionate people channel 70% of their effort towards development of the product. I believe business is more about selling and less about manufacturing/ development. If the product is best of the best but has no buyer, it is as good as not developing the product. But on the other side, if a product is not that good but has a 'pull' market and a 'ready client', it makes a better business sense.





LeadInvent Technologies Pvt. Ltd.

Founders: Pankaj Sharma, Surojit Bose and Praveen Agrawal

Year of Establishment: 2007

Location: New Delhi (earlier FIIT, IIT Delhi)

Annual Turnover: Rs. 50 lakh – 1 crore (average)

Team Members: 10

Area: Drug Discovery



Academic Background

Pankaj is B.Sc in biotechnology from Maharaja's College, University of Rajasthan and MCA from University of Jammu; Surojit is B.Tech in mechanical engineering from Veer Surendra Sai University of Technology, Odisha and Masters in software engineering and management from Pune and Praveen is M.Tech in mathematics and computing, IIT-Delhi

Motivation to Pursue Entrepreneurship

We wanted to create a unique company based on computational biology that would promote rational drug discovery rather than hit and trial drug discovery.



Identification of Business Opportunity

We were working at the Supercomputing facility at IIT Delhi. In 2002 we began developing new molecule simulation algorithms and science. By 2005 we had developed a large part of the science and algorithms as a software package and ended up publishing 15 papers in a span of 4 years. The portal was created and users were using it from all over the world. Then in 2005, a pharma company approached our group and asked if we could apply our technology for one of the cancer molecule that they were already selling in the market. They wanted us to develop a better one with lesser side effect than the one which was in the market. For next two years, we applied our technology and developed a series of compounds for them. This experience gave us a clear sense that our technology could be used for some of the research challenges faced by pharmaceutical companies. With that the idea became clearer and the team understood that there is value in the work and the need for this kind of technology and research in the market. At the same time HCL Technologies approached our lab and we started to provide consulting service to them on research area where they could grow their business. This provided us real time client interaction with some of the biggest global pharma companies and we realized that there is a huge market for a company that could use computer simulation and provide early molecule design to the pharma companies. At the same time we also realized that there were a lot of diseases where no company was willing to work because of low return on investment. We realized that with our own company we could give a realistic shot at cracking some of these disease and leave our foot print on people's lives. With that we formalized the idea into a Bplan, submitted it to IIT, got selected as the first life science company startup from IIT Delhi incubator and started the company in March 2007

Portfolio

LeadInvent has developed unique molecule simulation platform (christened LIDiscoverEngine). This simulation platform enables scientist to design and study molecules virtually on supercomputing platform before such



molecules are synthesized and tested experimentally.

LIDiscoverEngine provides atomic level insight and unravels the energetics of binding for a protein ligand system. Unique feature includes designing one molecule that can inhibit multi targets, repositioning known drugs for new use.

This technology has been implemented on a 600 core supercomputer and has successfully delivered multiple drug discovery programs. LIDiscoverEngine now has over 8000 target proteins and over 1 million molecule data set that allows for designing multi targeted therapies, repositioning known drug targets, building more selective molecules and fragment based molecule design

Commercialization Strategy

Our product commercialization strategy has been clear. We have worked closely with our partners to help them navigate through there drug discovery challenges

Mentors

Prof. B.Jayaram, Dr. Purvish Parikh, Dr. Bheemarao Ugarkar, Dr. N.G. Ramesh and Dr. P. S. Pandey

Critical Areas for Mentorship

Fund raising strategy and access to investor network, IP and corporate strategy planning and company position and competitor analysis and competitor landscaping with creation of unique value proposition

Funding Mobilized

Rs. 25 lakhs from DBT – BIRAC (SBIRI), Rs. 56 lakhs from DBT – BIRAC (SBIRI), Rs. 5.66 crores from DBT - BIRAC (BIPP), Rs. 1.93 crores from DBT –BIRAC (CRS), Rs. 70 lakhs from Genus Oncology, Rs. 25 lakhs from Sphaera Pharma, Rs. 5 lakhs from Ranbaxy and Rs. 5 lakhs from Novartis

Support from State

LeadInvent Tech is a DSIR certified company

Achievements

- BioSpectrum Asia Pacific Award for Emerging Company, Asia Pacific, 2011
- Awarded among “India’s top 10 path breaking Indian biotech start-ups, who thought ‘out-of-the-box’ away from traditional drug discovery” by an independent review board of Medgenera
- Awarded among “The 30 Most Influential Young Entrepreneurs - India” by Insights Success, 2016

Entrepreneurial Journey - Nutshell

Drug discovery is the science of the unknown. To begin with no two diseases are the same and there are multiple ways in which you can approach such disease from a therapeutic point of view. Most of the current therapies were discovered at least 20 years back simple because it takes over 10 years for a drug to mature from an idea stage to a marketed therapy stage. While the current therapies are doing a great job in providing treatment options to patients; there is tremendous opportunity to learn from them and improving where they are lagging.

At LeadInvent we looked at this problem and realized that computational chemistry integrated with molecule synthesis is perhaps the right approach than hit and trial for drug discovery. Computers could help design millions of molecules virtually and test them in simulated environment before they are physically synthesised. We had the right technology and decided to write a business plan and started the company



Lessons from the Journey

We faced many challenges. One of them was indeed the disadvantage of having a young team claiming to do complex scientific work in a domain where very few Indian companies had ventured. Convincing early customers and partners was a big challenge since we as a company did not have much track record. Another big challenge was to fund raise for the venture. We were fortunate enough to benefit from various Government funding schemes. From an India perspective these are challenging times for Indian life science industry. It seems to be going through a transition phase. Some of the biggest Indian pharma companies have recently shut down their drug discovery centres indicating a shift from the traditional way of drug discovery. A similar trend is being observed globally where big companies are consolidating their R&D resources into smaller centres. It is evident that to come up with new molecules and to make quick progress on new drugs. It is very important to seamlessly integrate the different R&D teams and technology is driving this conversation forward.



Road Ahead

LeadInvent team has now diversified its focus towards drug delivery with the use of nanotechnology. In the next 5 years we are planning to create a pipeline of our own drugs.

Advice for Budding Entrepreneurs

For someone who is just starting out I think the most important advice is to know what you can do and what you cannot do for your venture. Have a very clear distinction and bring in new members to your team who would fill those gaps that you cannot fill. Always remember that a bunch of complementary team members is a force to reckon with and one that can be the difference between a struggling start-up and one that shakes up the world.



MRD LifeSciences Pvt. Ltd.

Founder: Manoj Verma

Year of Establishment: 2008

Location: Lucknow, Uttar Pradesh

Annual Turnover: Rs. 57 lakhs (average)

Team Members: 15

Area: Contract Research and Training



Academic Background

Manoj is a post-graduate

Motivation to Pursue Entrepreneurship

Motivation comes in countless different forms and in the entrepreneurial world, staying motivated is required to succeed. The factors which motivated me to pursue entrepreneurship were change, challenge, creativity, curiosity, control and cash

Identification of Business Opportunity

The ability to identify business opportunities is an essential characteristic of an entrepreneur opportunity-favourable position or a range for advancement. The steps in arriving at business opportunity for me were generating idea, screening process formulating the concept of the business

Portfolio

Our major services are customized services towards sample analysis, contract research, project writing, experimental designing and report writing for academia/ industry. The major area in which training is provided to students are Molecular biology, Enzymology, Recombinant DNA technology, Microbiology, Bioprocess and Fermentation, Quality control and Pharmacology

Commercialization Strategy

We provide all-in-one solution to facilitate the research projects related to life sciences on contract basis. We have on-going research assignments in collaborations with reputed institutional organizations and corporate clients. We have an independent R&D wing, which has developed many molecular biology products and healthcare products. We are involved in genetic diversity, molecular biology, industrial microbiology, enzymology, plant metabolites, antibiotics, waste management, bioremediation, biochemistry, food technology and other high demand areas

Products in the Pipeline

- In future, our company plans to commercialize some antibiotics which are in natural form, we are plan to start the commercialization of Insulin protein with the lower price as compare to other companies
- We are planning to launch our Energy drink product which is different thanthe energy drinks available in market. Till date, we have completed market research work and start taking feedback from customers to launch this product till next year



Mentors

Dr CKM Tripathi, Dr. Raghvendra Pal Singh and Dr Chandan Prasad

Critical Areas for Mentorship

Mentors help to expand our work to the next level. It takes some guesswork and hit & trial to work out of the process. Mentorship saves us lot of money during the critical growth stage. A mentor is an outside expert who can often guide us on ways to carry out the any task better; more efficiently or even let you know if it's something worth spending money on at all. As entrepreneurs, we can get so passionate that we develop tunnel vision

Funding Mobilized

Funds from DBT- BCIL (BITP and BIITP)

Achievements

- Since 2009, we have trained more than 3000 students so far
- Developed some molecular biology kits (Plasmid DNA mini preparation / Genomic DNA preparation / RNA preparation)
- Developed a novel health care product which is effective for dermatology diseases
- No of research paper published: 70
- Our young scientist had published few books in Lambert Academic Publishing

Entrepreneurial Journey - Nutshell

Entrepreneurship can be a tough and long journey. Some get lucky and succeed the first time. For me, that wasn't the case. I continue to learn and grow

Lessons from the Journey

The outcome of the journey is not only a business plan but an acquired methodology for updating and re-thinking the business plan in future. Identify the winning strategies for success in business and summarize the findings of the study and establishing as bench mark for future entrepreneurs to be successful

Road Ahead

Our vision is to be a leading biotech company in India and to be a significant global player by the next 5 years

Advice for Budding Entrepreneurs

- You could pursue these ideas by asking yourself some key questions such as - "Is the market real? Is the product or service real? Can I win? What are the risks? And is it worth it?"
- Willingness to persevere even if the business is failing and having a strong desire to achieve high goals in business is very important for budding entrepreneurs.





Osteo3d Pvt. Ltd.

Founders: Deepak Raj and Neela Govind

Year of Establishment: 2014

Location: C-CAMP, Bengaluru, Karnataka

Annual Turnover: Rs. 60 lakhs (average)

Team Members: 7

Area: Customized Biomedical Products



Academic Background

Deepak and Neela are engineers from Mangalore University and MBA from IIM-Bangalore

Motivation to Pursue Entrepreneurship

Fear of retirement motivated us to pursue entrepreneurship

Identification of Business Opportunity

Business opportunity was identified evaluating the unmet customer need

Portfolio

- Cranial Helmets
- Patient Specific 3D Printed Organs



We have designed and developed customized 3D printed helmet for paediatric post endoscopic craniosynostosis patients. The helmets are designed specifically for each patient as specified by the doctor for the appropriate development of the skull. Other than this we create custom flexible 3d printed models of organs in different colours at affordable price points for pre-surgical planning and customized 3D printed medical models for surgical planning at affordable price points resulting in zero net effective incremental costs to the patient

Products in the Pipeline

Custom solutions for pre-surgical, surgical and post-surgical requirements

Mentors

Our customers, suppliers and well-wishers



Critical Areas for Mentorship

It depends on the background of the founders:

- Economic / financial / business outlook may be missing in founders who have been in the technical area. They would need support in terms of looking at the market and creating a viable business plan for the organization
- Some founders who have good background in business do not seem to understand technology. They would need to spend more time with the team and understand the product to really understand the core technology and customer offerings.

Funding Mobilized

Self-funding, grants and revenues from paying customers

Achievements

- ISO 13485 certification
- Online software launched in November 2016
- 297 live cases across India

Entrepreneurial Journey - Nutshell

We have been able to generate revenues to sustain operations

Lessons from the Journey

We learn from all clinical cases, customers, partners and stakeholders. Lots of lessons were learnt from the journey

- Making a business plan
- Understand your customer
- Cost of customer acquisition
- Acquiring repeat orders
- Creating competitive advantage / differentiation
- Making long-term plan without losing focus on short term
- Do not get carried away by technology!

Road Ahead

We plan to make our operations self-sustaining providing affordable healthcare at high levels of quality

Advice for Budding Entrepreneurs

- Focus on your customer
- Create a self-sustainable business model
- Do not get carried away by the hype of entrepreneurship as being portrayed elsewhere
- It is a tough task – perseverance, persistence and focus on the business model based on technology that helps address a need.



Phasorz Technologies Pvt. Ltd.

Founders: Enbasekar D and Satish Kannan

Year of Establishment: 2014

Location : IIT Madras Incubation Cell, Madras and Bengaluru, Karnataka

Annual Turnover: Rs. 3-5 crores (average)

Team Members: 65

Area: IT Healthcare



Academic Background

Enbasekar and Satish are B.Tech and M.Tech in electrical engineering from IIT Madras

Motivation to Pursue Entrepreneurship

Our motivation has been to solve a problem that potentially helps millions, and entrepreneurship can help do that. Also, it is an opportunity to maximize one's potential to get more things done. Creating something new from scratch and something that is of value to others is an amazing thing.



Identification of Business Opportunity

DocsApp was founded in 2015 at the IIT Madras Research Park. Satish comes with prior experience in healthcare sector through his previous stint at Philips healthcare while Enbasekar previously helped build technologies to identify blindness caused by diabetes.

Satish and Enbasekar spent years working in the field of healthcare - talking to doctors, patients and waiting in hospitals. Working in the health tech industry enabled us to understand the space better. Also we analysed the existing problems keenly, understanding what kind of solutions get adopted and why change is resisted; helped us to understand the existing problems and also build solutions that work. It is estimated that up to 70 percent of the most common health issues people face can be managed online. The patient doesn't need to travel to have a medical consultation. We want to bridge the gap between patients and doctors through this platform so that people can get expert consultation on demand. We believe that this will also help us take specialised care downstream to more remote areas across the country

Portfolio

- DocsApp- App for patients to consult doctors
- Doctor's app - App for doctors to answer queries of the patients

DocsApp is a mobile medical consultation platform which provides consultation for patients over chat with estimated turnaround times of 30 minutes. Patients can chat with the doctor and also share pictures and reports of the ailment with the doctors privately.



Commercialization Strategy

DocsApp works on a revenue sharing model with their doctor partners and take a percentage on each transaction. DocsApp has a pool of 500 doctors in the country who are available to connect with the patients for consultations. In addition to consultation, for which DocsApp also provides local language support, users can also avail services such as- sample pick ups for lab tests from home and get medicines delivered in seven cities.

Funding Mobilized

Total funds of \$US 2 Million of which \$US 1.2 million from venture capital firm Rebright Partners

Achievements

Building a product that is genuinely helpful for something as fundamental as health; and being accepted and adopted by both doctors and users. Building and working with an A+ team of 60 is a journey all by itself. I have thoroughly enjoyed the journey, so far, looking forward to see what the future has in store

Entrepreneurial Journey - Nutshell

We started from 1 or 2 users in a day and now we are serving over 1000+ users. We have grown from a 2 person team to 60 membered company which has been a great journey. Practo and Portea are two big players in the healthcare space in India but neither of them have so far ventured into chat based consulting services yet. With about 500 doctors and 3,000 labs in their network currently, we aim to utilise the funding to develop and expand their scale of operations, recruit talent and invest in technological advancement to better cater to their customers and partners

Lessons from the Journey

It is critical to validate the need early. We were focussed on overcoming the critical friction points early, by constantly engaging with both doctors and users. We also learnt that you should not be afraid to take tough calls, even if the results are not great, in the short-term and focus on core value rather digress on several smaller issues which may not have greater impact



Road Ahead

In coming years, we hope to garner more users and doctors to enable faster health care access. We aim to reach over 100 million users in India while creating fundamental value for our users and doctors

Advice for Budding Entrepreneurs

- Never give up, but be agile
- Sell before you build
- Focus on few high impact things in the business
- Always solve the toughest problems first- i.e. user acceptance/need and not technology /user interface / product features
- Track metrics daily and share with the team.



Swagene Pvt. Ltd.

Founders: Sooraj Ratnakumar and Vani KM

Year of Establishment: 2014

Location: Chennai

Annual Turnover: Rs. 1 crore (2015-16 and 2016-17)

Team Members: 8

Area: Genetics and Genomics



Academic Background

Sooraj is B.A in psychology from Annamalai University, B.Sc in microbiology from University of Madras, M.Sc in molecular medical microbiology from University of Nottingham, Ph.D in biotechnology from University of Cambridge and Postdoctoral Fellow from EPFL Switzerland, University of Washington, Seattle and University of Cambridge and Vani is MBBS, Kilpauk Medical College and Post Graduate Diploma in gynaecology and obstetrics from Manipal University



Motivation to Pursue Entrepreneurship

As a molecular biologist, Sooraj wanted to explore the two biggest avenues career-wise. Sooraj enjoyed academic research and freedom in the best institutes in the world, but still felt there was some limitation. He found that science and research brought me the greatest happiness, but academia was not the zone for me. A brief stint at a pharmaceutical company further confirmed that he was at the wrong place doing the wrong stuff. That is when the idea of starting an advanced molecular diagnostic lab came up. Vani was also in the midst of a career break and debating half-heartedly whether to resume her clinical practice. It happened to be the perfect mix and now both of them are in the zone doing stuff they are totally passionate about. Though they have known each other all their lives, working together wasn't easy to begin with. In a year they have learned each other's strengths and work habits, and today they are so much more dynamic and synergistic as a team

Identification of Business Opportunity

Swagene is foremost a knowledge sharing lab, spreading awareness on advanced yet affordable medical options to doctors and public. India is a place with more commerce than science, more affordability than quality, and therein lays a huge gap. We knew that we can bridge these differences by combining affordable business with quality science. For instance, about 50% of our tests are first-in-market to South Asia, borne out of extensive research into modern clinical trials. Only those biomarkers that have clinching evidence of dramatic improvement in treatment come out of our R&D into the market. People used to think that the role of genetics ended with hereditary disease. At Swagene, we were excited by this opportunity to help sick people get better by spending much less time and money using molecular tools. We can now predict response to different therapies and thus avoid trial-and-error medicine which is both costly, time-consuming, and puts an unnecessary drug and hospitalization burden on the patient



Portfolio

Personalized medicine is the modern concept where the patient is at the centre rather than the disease. Personalized medicine looks at a patient's genes and aims to bring down healthcare expenses by determining the drugs or procedures that are likely to work well, while preventing severe side effects. Late diagnosis invariably leads to high treatment costs at a higher failure rate. We're changing this lose-lose proposition to a win-win for both patients and doctors.

- **Oncology:** Several drugs, surgical and chemotherapeutic modalities are effective and indicated only in the presence or absence of certain mutations. It is therefore routine practice now to test for these specific mutations based on cancer type before initiating therapy. Moreover, molecular diagnosis by PCR offers the highest sensitivity and accuracy among all diagnostic technologies, that these may now be availed at the earliest stage of cancer leading to increasing 'cure' rates for what were once thought to be incurable diseases.
- **Fertility:** Usually, below 50% of men respond favourably to hormone therapy. We now know this is because the responsive men carry certain genetic variants. Identifying these men beforehand and only providing them the hormone therapy improves success rate to about 90%. Hence the responders benefit, while the non-responders may avail other efficacious treatment choices without having spent on ineffective therapy.
- **Cardiology:** We also focused on cardiology because of the magnitude of heart disease burden in India, and where people undergoing drug therapy or having undergone interventional treatment are still left with life-threatening complications. For instance, patients with hypertension are almost universally taking several drugs to control BP. In all likelihood, only some of those drugs are actually benefiting BP control in the patient, while others come with known long-term side-effects such as diabetes and low sodium condition.
- In addition, we have expanded to numerous other medical specialties such as diabetes and obesity, dermatology, gastroenterology and orthopedics.

Products in the Pipeline

Our future plan is to make molecular diagnostics rapid, easy and affordable. In cancer therapies, genetic tests guide treatment regimens in terms of duration and drugs. Majority of cancer patients in India lack access to these important tools for various reasons. We plan to make molecular diagnostics available, accessible and affordable for everyone

Mentors

Several doctors and well-wishers

Critical Areas for Mentorship

Business strategy and marketing strategy

Funding Mobilized

Funds from bank loan, family and personal savings

Entrepreneurial Journey - Nutshell

Our biggest source of support and encouragement are the doctors and patients that use our services. Their belief in us and our ability to build this trust are our strengths. Doctors also call us for discussions and expert opinion on molecular diagnostics and genetics for their patients. There are numerous doctors that ardently back us because of what we do and how we do it.

The academic medical community has been overwhelmingly supportive and even encouraging of Swagene accelerating the introduction of the latest clinical advances in the West to India. We are regularly invited to speak



at conferences and seminars in Oncology and Reproductive Medicine, where physicians get to challenge as well as understand the scientific aspects of exploring modern medicine in clinical practice.

A recent anecdote is of a 38 yrs woman with BMI 17, who developed hypothyroidism despite being physically active and maintaining a healthy lifestyle. Ultrasound found multiple nodules, but cytology did not reveal anything suspicious. A recently introduced molecular test by Swagene detected a mutation associated with a less aggressive form of thyroid carcinoma. The doctors can monitor precancerous tissue and cancer may be prevented even in cases of somatic (non-hereditary) mutations. Patient can be managed better in terms of both monitoring as well as surgical intervention before the development of cancer

Achievements

- Certifications: NABH-certified Genetic laboratory; DSIR-certified R&D laboratory; DIPP-certified Innovative startup
- Awards
 - FICCI DST-Lockheed Martin Gold Medal for Innovation
 - CII Startup of the Year, healthcare
 - NASSCOM 10K Startup
 - IIT Kharagpur: Most Innovative Startup, Empresario
 - IIM Ahmedabad: Masterplan Winner
 - BITS Pilani: Conquest Winner
- Featured in National media
 - Business Standard
 - CNBC Young Turks
 - Economic Times Health
 - Yahoo! News
 - Part of stories in Economic Times, Times of India, Indian Express, Deccan Chronicle
 - Featured on various blogs and online media outlets



Lessons from the Journey

The most interesting or rewarding result has nothing to do with being an employee or an entrepreneur. My most rewarding moments are when doctors seek us out for expertise, when patients call us requesting for information on our tests and reports. It is a stressful business because we feel responsible for people's health and lives on a daily basis. But it is highly reassuring and rewarding when physicians call to confirm our diagnosis, especially when it is at odds with clinical diagnosis.

The Government in India has not awakened to the fact that startups originate with completely novel ideas. The focus on manufacturing vis-à-vis service for instance, deprives startups like ours of several benefits. We have to pay high customs duties and other taxes in order to benefit our own population. This makes the Government lose valuable foreign exchange as advanced diagnostics are now getting exported to China and elsewhere. R&D is also quite finance-intensive. Although we work with a "jugaad" mentality, medical technology has to be foolproof when it is out of the door, there's no opportunity for a beta version here. This means we are running a very tight ship when it comes to innovation. But transforming healthcare by providing the highest quality diagnostics to all is the vision for Swagene, and we hold that dear



Road Ahead

We have just started our journey. We have a long way to go towards developing advanced molecular diagnostics in our laboratory and offer them in India. Advanced technologies take several years to reach India, and even so samples are shipped to Europe, USA and China for these tests adding to both costs as well as turnaround time. We will have completely validated advanced tests such as liquid biopsy to diagnose cancer in blood in our lab thereby reducing both cost and turnaround time, while contributing to the 'Make in India' initiative of the Government of India

Advice for Budding Entrepreneurs

- Establishing expertise should be priority in hard technology! We found early on that the top specialists in every medical specialty absolutely valued the expertise we provided. So we kept building more upon our knowledge in serving our customer and non-customer doctors diligently in queries irrespective of whether we offer those tests
- External challenges can force a downturn, overcome them! In December of 2015, we faced massive floods in Chennai thus losing quite valuable inventory because of lack of electricity for several days, 2016 is ending with its own set of challenges including the demonetization and a severe cyclonic storm. We have learned by now to stand firmly rooted during these times and especially use these brief imposed hiatus as opportunities to introspect and improve
- Lastly, focus on your customers and absolutely no one else.

PRE- COMMERCIALIZATION

Startups with Product/Services
in the Development Stage



IDEATION

DEVELOPMENT

COMMERCIALIZATION



BIO

PHARMACEUTICALS



Aaranya Biosciences Pvt. Ltd.

Founders: Savithiri Shivakumar and Sivakumar

Year of Establishment: 2013

Location: Golden Jubilee Biotech Park for Women, Chennai, Tamil Nadu

Annual Turnover: Pre-revenue Stage

Team Members: 10

Area: Genomics and Genetics



Academic Background

Savithiri is B.Pharm (Honours), M.Pharm, Ph.D and PG Diploma in Business Administration and Sivakumar is B.Sc(Technology) and MBA from IIM

Motivation to Pursue Entrepreneurship

Our motivation has been to give back to the society. Being first-time entrepreneurs belonging to middle socio-economic background, we understand the value of money and cost of healthcare in India, which we would like to bridge the gap. Providing women, child and geriatric care in affordable way to the society is the main motivation. To fund our dream venture, we wanted to leverage our experience and knowledge gained from contract research organizations, academia and industry for the support of our social cause

Identification of Business Opportunity

Working in hospitals, contract research organizations, academia and industry gave us the experience, knowledge and confidence in identifying the market needs and customers

Portfolio

- Preclinical testing (ADMET, disease models)
- Genetic testing (pre-genetic screening/gene and chromosomal disorders, rare diseases)
- Synthesis of molecules from mg to kg level; phyto-extraction and training and consultancy services

Commercialization Strategy

Products are in the process of validation and trial experiments using marketed kits

Products in the Pipeline

The following products are in process of development and still in optimization stage -

- Diagnostic Kits in the area of single gene disorders and chromosomal disorders; diagnostic reagents in forensics and teaching kits to students
- Single gene disorder kit designing done and validation to be initiated by 2019

Mentor

Sivakumar



Critical Areas for Mentorship

Prioritization of the activities, legal and IPR, networking and handling situations with alternatives in difficult phases of business

Funding Mobilized

Collaborative research projects from company, training, drug discovery projects and testing for hospitals

Achievements

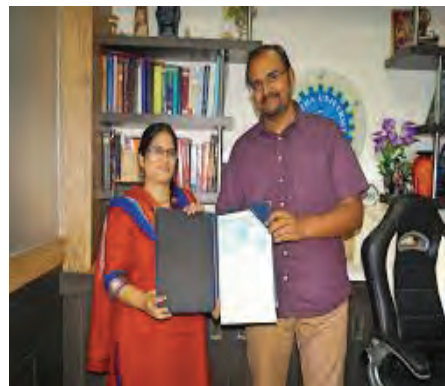
- Statutory approval from Government (PNDT) to be as a genetic testing laboratory where we perform pre-implantation genetic screening (PGS)
- Statutory approval from CPCSEA for using small laboratory animals for cell biology and molecular biology laboratory testing to handle clinical samples and conduct biochemical, molecular and chromosomal aberration studies for clinical programs
- MoU for academic collaboration with universities

Entrepreneurial Journey - Nutshell

We are serving global clients in USA, Australia and Asia. We are providing services such as low-cost diagnostic screening to hospitals, industrial training to faculty, students and professionals

Lessons from the Journey

Business in the sector of translational research and molecular diagnostics which we chose needs infrastructure, knowledge, experience and networking as the essential elements. Due to our networking and experience in the research field, getting the customer projects was cakewalk. As the market needs were identified and known to us, it was easy getting the projects. The team was enthusiastic and worked smartly by networking with existing accredited laboratories and executed to deliver the services successfully to the customers in the initial months of the venture. As a first time entrepreneur in the family, getting the infrastructure in place was a major challenge to deliver the work consistently with customer satisfaction. For the long term growth of any company, depending on the other laboratory causes time delay to deliver projects as per customer satisfaction. Hence, Biotech Park module gave us faith to fulfil our immediate goal in putting in place the infrastructure to deliver our vision. While working with clients, innovation and customer satisfaction may not yield revenue generation unless we have been legally protected through contracts. This was learnt in a harder way by us after losing our hard-earned money



Road Ahead

We wish to be the leading provider of PGS screening to IVF centres and translational research service provider by providing preclinical and clinical programs. We would like to establish synthesis of API, biologicals and biosimilars and herbals. We like to establish GLP animal facility and world class in-vitro facility. We would also like to launch affordable diagnostic kit for cytogenetics focusing on women, child and geriatrics research and hospital

Advice for Budding Entrepreneurs

Identifying the market and timing for market entry is important alongwith supportive resources like infrastructure, people and networking skills. One should self-introspect before embarking on the path of entrepreneurship. Passion and Patience and Persistence (3P's) required for being an entrepreneur.



ABC Genomics India Pvt. Ltd.

Founders: Sabih A. Farooqi, Ram K. Thapliyal and Gazala Farooqi

Year of Establishment: 2007

Location: Biotech Park, Lucknow, Uttar Pradesh

Annual Turnover: Pre-revenue Stage

Team Members: 8

Area: Molecular Diagnostics



Academic Background

Sabih A. Farooqi and R. K. Thapliyal are from management background

Motivation to Pursue Entrepreneurship

Developing nations like India have a pressing and often greater need for high-throughput genomic tools for development of products and services in areas relating to health, agriculture, bioenergy and environment. Many of these tools are currently expensive and their availability and use is extremely limited in the developed world and to address this need, ABC Genomics embarked on a mission to make high-end and sophisticated genetic marker-based tools available at an affordable cost



Identification of Business Opportunity

India is experiencing a rapid health shift with an increasing burden of various diseases like tuberculosis, diabetes, water-borne diseases, etc. There is huge gap in the availability of robust, low cost, point-of-care genetic assays & tools for easy & early diagnosis of such diseases. The company conducts research to develop and commercialize low cost genetic assays on a portable or hand-held system so has to provide a better health and clean environment

Portfolio

ABC Genomics offers a number of low cost genomic tools/solutions, such as:-

- End-to-End solutions in the area of genomics, proteomics, bioinformatics and nanotechnology, especially contract services in customized Microarrays, expressional studies, gene based diagnostics, low cost molecular tools, microfluidic devices and nanotechnology based solutions/products
- POC Genetic testing device development & to provide services and products related to all types of diagnostic biochips.
- Conduct research to develop and commercialize low cost genetic assays on a portable or hand-held system.
- Imparting high end hands-on training in the above areas

Product in the Pipeline

A hand-held point-of-care device capable of detecting TB/MDR/XDR TB, diabetes and waterchip for water borne pathogens detection



Mentor

Prof. Syed A. Hashsham, MSU, USA

Critical Areas for Mentorship

Point-of-care device development

Funding Mobilized

Rs. 25 lakhs from DBT – BIRAC (BIG); Rs. 72 lakhs from Indo-German Science & Technology Centre and Rs. 85 lakhs from Ahmedabad University

Entrepreneurial Journey - Nutshell

Mr. Sabih A. Farooqi being from a financial & management background (CGM at SBI) had observed that biotechnology is emerging new area in life sciences and provides lot of scope for research especially on health related issue as well as commercial use of new technologies especially in the field of gene based diagnostics. Fortunately, few eminent scientists working in the national laboratories of USA encouraged Mr. Farooqi to establish a scientific laboratory and assured him of their technical support and mentorship as and when necessary. Dr. Somesh Mehra, Senior scientist looks after the operations of the company. Being a budding biotech startup company, major challenge has been to withstand funding crisis so as to sustain and transform idea to technology commercialization. After a long & persistent hard work, passion & zeal to innovation, we succeeded in getting support and funding from DBT-BIRAC, Ahmedabad University, IGSTC and BCIL

Lessons from the Journey

To manage funding gaps for R&D work has been the most critical challenge. Especially for startups like us, pressure to manage financial crisis keeps building up. But, this is good in achieving productive results. The second critical challenge faced has been to get and maintain certain recognitions or approvals from Government bodies, required as an essential eligibility prerequisite for funding by various funding agencies. Some such norms have been relaxed in our case; being incubated in the Government established Biotech Park. The third most critical challenge has been to recruit good human resource

Road Ahead

In the next five years, we are confident to achieve our goal i.e. development, validation & commercialization of our innovative products and are determined to lead in the healthcare sector especially in rapid & low cost diagnostic and point-of-care (POC) genetic testing devices

Advice for Budding Entrepreneurs

One should have a quality business plan, innovative idea and obviously great passion to make it success. Avoid high expenditure in less fruitful zones especially during early stage; have mentors for each line; know your potential investor audience and funding partners and increase the application horizon. And last but not the least, build an excellent team



Ahammune Biosciences Pvt. Ltd.

Founders: Parul Ganju and Krishnamurthy Natarajan

Year of Establishment: 2016

Location: Venture Center, NCL Innovation Park, Pune, Maharashtra

Annual Turnover: Pre-revenue Stage

Team Members: 5

Area: Molecular Therapeutics



Academic Background

Parul is Ph.D in skin biology from National Institute of Immunology, Delhi and Krishnamurthy is Ph.D from Jawaharlal Nehru University, Delhi and Post Doctoral fellow from NIH, Bethesda

Motivation to Pursue Entrepreneurship

Vitiligo is a debilitating disease that affects about 80 million people. Parul's Ph.D on skin biology got her in contact with several patients and made her realise that the disfigurement caused by this disease is a cause of immense psychological distress. All patients wanted solutions to this life-altering problem. The dream of translating her scientific research to develop new solutions for society motivated her to start this ambitious venture

Identification of Business Opportunity

Vitiligo therapeutics arena is an unmet medical need as the current treatments are only partly successful in a handful of patients. Even the pipeline treatment strategies are off-shoot of ongoing programs as there is a limited understanding about the disease. The huge Vitiligo market is waiting to be tapped with innovative solutions that are based on solid scientific backing

Products in the Pipeline

Topical therapy for stalling Vitiligo spread. Ahammune is an innovation driven drug discovery based company focused on developing new treatment options for dermatological disorders involving the skin immune system. Ahammune's vision is to provide new solutions to patients affected with vitiligo, a debilitating depigmentary disorder for which currently there is no cure

Commercialization Strategy

We have initiated a first-in class program on vitiligo therapeutics and we plan to take our novel drug pipeline assets through successful phase I and II trials in India in the next 3-4 years

Mentors

Dr Bhan (former Secretary, DBT, Govt of India) is the Chairman of Board of Directors of Ahammune and Prof P. Balaram (former Director, IISc, Bangalore)

Critical Areas for Mentorship

Budding entrepreneurs especially in the pharma sector require mentoring to make their dream into reality. Fund raising, regulatory and clinical aspects in drug discovery are few areas where mentoring is required



Funding Mobilized

Rs. 5 crores from early stage investors –Dr. Gautham Nadig: Co-founder, Metahelix, Dr. Anand Deshpande: CEO, Persistent Systems Ltd and Dr. Ganesh Natarajan: Chairman, 5f World

Achievements

- Ahammune is the 2nd company in India to be granted the three-year tax holiday by the Government under the Start-up India Action Plan
- R&D lab got DSIR certification
- Adjudged “Most promising Startup Team of the Year” at Clarion Call 2.0, organized by IIMCAA



Entrepreneurial Journey - Nutshell

We have identified a new druggable pathway to be involved in vitiligo pathogenesis and are developing new chemical/molecular entities (NCE/NME's) targeting this pathway. Our initial studies have identified a new hit molecule for this pathway that we are in the process of optimizing. This mechanism can be a platform technology and the NCE/NME developed in the company can simultaneously provide basis to resolve other skin diseases as conjugate adjuvant therapy



Lessons from the Journey

Setting up new things is always a challenge. With my purely academic background, running a company was initially pretty difficult. But I learnt on the job and I also had the support of my strong team backing me. Though hurdles are there, but being a scientist has taught me not to be discouraged with failures and always strive for excellence

Road Ahead

We see Ahammune as a gamechanger in vitiligo therapeutics arena with quality products derived from discovery-oriented innovative research. Our vision is to demonstrate to the world that we as a nation can foster new molecules for complex diseases

Advice for Budding Entrepreneurs

- Be thorough in whatever you do as there is no substitute for hard work
- Passion and perseverance are keys to success
- Always stay motivated and do not be afraid of failure.



Aten Porus Lifesciences Pvt. Ltd.

Name: Arun Papaiah, Aditya Kulkarni and Srinivasan Namala

Year of Establishment: 2014

Location: Bengaluru, Karnataka

Annual Turnover: Pre-revenue Stage

Team Members: 8

Area: Drug Discovery



Academic Background

Aditya is B.Sc from Christ College, Bangalore, M.Sc from Leeds University, England and Ph.D from Purdue University, USA and Arun is B.Sc from Christ College, Bangalore and MBA from Royal Melbourne Institute of Technology, Australia

Motivation to pursue Entrepreneurship

Our motivation to entrepreneurship has been our passion for drug discovery and solving unmet needs in healthcare.

Aditya Kulkarni, a chemical biologist, became interested in rare diseases that afflict miniscule populations while pursuing his PhD at Purdue University. In 2014, after he returned to India, his college friend Arun Papaiah and he decided to establish Aten Porus Lifesciences to develop drugs to treat or manage these so-called orphan diseases



Identification of Business Opportunity

Business opportunity was identified based on unmet needs in healthcare for rare diseases in India. We thought that this was one area where we can make an impact as orphan diseases have a huge unmet medical need and India has 70 million patients across 7000 rare diseases. To begin with, we decided to focus on Niemann-Pick Type C (NPC) disorder that's also referred to as Childhood Alzheimer's. The disorder is characterised by over-accumulation of cholesterol in the body in such a way that it causes severe damage to the brain, liver and spleen.

Products in the Pipeline

Novel drugs for rare lipid storage disorders

- Best-in-Class Drug for Niemann-Pick Type C Disorder
- First-in-Class Drug for Focal Segmental Glomerulosclerosis

Commercialization Strategy

Aten plans to partner with pharmaceutical companies that have established marketing, production and distribution channels

Mentors

Dr. Swaminathan Sivaram (NCL/IISER) and Dr. Taslimarif Saiyed (C-Camp)



Critical Areas for Mentorship

Translational science and fundraising

Funding Mobilized

Rs. 50 lakhs from DBT – BIRAC (BIG), Rs. 50 lakhs from DBT – BIRAC (SIBRI), \$US 1 million (seed funding) from Porus Labs and \$US 1.4 million (bridge funding) from US based company

Achievements

- DBT-BIRAC Ignite Fellowship, 2016
- Featured as Economic Times Hot Startup, 2017
- Poster Presentation at Gordon Research Conference on Lysosomal Diseases, March 2017

Entrepreneurial Journey - Nutshell

We have developed first candidates for rare and orphan genetic disorders. We are in discussions with several pharmaceutical/biotech firms that are interested in licensing our products. Rare diseases have a fast-track approval with orphan designation and lot of incentives from regulatory bodies such as the USA-FDA and European-EMA. The sheer number of rare diseases coupled with very few major pharmaceutical/biotechnology companies focusing on them offers a great opportunity for companies like Aten

Lessons from the Journey

Our primary challenge was fundraising but funding from the BIG scheme helped in beginning/initiating and validating the project

Road Ahead

We look forward to licensing/partnering with pharmaceutical/biotech firms for our Lipid Storage Disorders Technology Platform. We also aim to broaden the scope to with metabolic disorders such as non-alcoholic fatty liver disease, atherosclerosis, etc.

Advice for Budding Entrepreneurs

Start fundraising early on and apply for non-dilutive funding constantly.



BiolMed Innovations Pvt. Ltd.

Founders: Anuya Nisal, Premnath Venugopalan and Ashish Lele

Year of Establishment: 2015

Location: Venture Center, NCL Innovation Park, Pune, Maharashtra

Annual Turnover: Rs.12 lakhs (average)

Team Members: 6

Area: Biomedical Implants



Academic Background

Anuya is Masters in materials science and engineering from University of Delaware and Ph.D in chemical engineering from IIT, Premnath is Ph.D in chemical engineering from Massachusetts Institute of Technology, Chevening Technology Enterprise fellow with Center for Scientific Enterprises, London Business School and University of Cambridge, and Ashish is Ph.D in chemical engineering from University of Delaware and Post-Doctoral Fellow from University of Cambridge

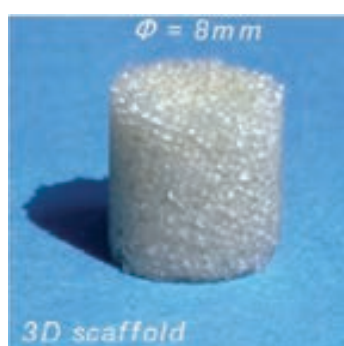


Motivation to Pursue Entrepreneurship

The primary motivation to pursue entrepreneurship was to convert the interesting science and invention from the lab into useful products that would benefit the Indian society. Healthcare in India is predominantly managed by the private sector and only about 25% Indians have access to health insurance. This means that most Indians pay from their pockets for healthcare. One of the primary motivations of the cofounding team was to use science and technology from the lab to make affordable biomedical products. There are several legendary, pioneering and inspirational examples in the west where scientists such as Prof. George Whitesides, Prof. Richard Friend have taken science from their lab to the market. With the Indian Prime Minister launching several national missions, we saw an opportunity to realize our dreams

Identification of Business Opportunity

Our group has been working on development of novel material based solutions for biomedical applications for more than a decade now. Our interactions with surgeons in tertiary care hospitals in Pune helped us understand the problems and the needs. One of the important learning was that most biomedical technologies that have been commercialized in the developed countries are either inaccessible or unaffordable in India. We identified bone



graft substitutes as one of the key areas where we could make a difference. One of the patents filed in our group was then leveraged to develop bone grafting materials. Thus, a start-up was incorporated and the know-how was licensed to this start-up from the parent laboratory to take forward this opportunity

Products in the Pipeline

- SerioSS® – is an osteoconductive bone void filler material useful in cancellous bone defects. It has special applications in osteoporotic fractures, which typically affect the quality of life in bottom-of-pyramid women patients



- Serimat® – is a reconstruction matrix useful in soft tissue regeneration such as organ reconstruction surgeries

Commercialisation Strategy

BiolMed will launch its products after completion of the necessary regulatory approvals, which means both Serioss and Serimat are expected to reach the market by 2021

Mentors

Dr. Ravindra Ghooi and Dr. Ashish Ranade

Critical Areas for Mentorship

One of the key areas of mentorship for budding technology entrepreneurs is finance and marketing. They are excellent technologists themselves, but an entrepreneur must understand that technology is only 10% of the job done. The rest 90% depends on several other factors. Many entrepreneurs lack the understanding required for building up a sound business plan, deciphering the conditions in a term sheet, legalities involved in building a start-up, critical market and need analysis and so on. They need to identify right mentors and find enabling mechanisms to engage with these mentors

Funding Mobilized

Rs. 75 lakhs from DBT-BIRAC (BIG and SBIRI)

Achievements

- BiolMed is a spin-off company of the CSIR-National Chemical Laboratory, India
- Top 10 in India AIT Camp of Swissnex
- Among top 500 start-up companies globally at the Hello Tomorrow Global Summit held in Paris, France, October 2016
- BiolMed is a DSIR recognized R&D laboratory

Entrepreneurial Journey - Nutshell

BiolMed Innovations is a scientific enterprise promoted and founded by scientists from CSIR- National Chemical Laboratory in Pune, under CSIR's scientific entrepreneurship scheme and under the Lab2Market program of Venture Center. BiolMed leverages materials science of natural silk proteins to develop and sell biomedical implants and advanced consumer products. IP is related to designing, structuring and tailoring silk-based materials. BiolMed is in the final stages of discussion for BIRAC-BIPP and Millennium Alliance grants. BiolMed's founders are experienced biomed technology developers with backgrounds from IIT, UDCT, Delaware, Cambridge, MIT and GE

Lessons from the Journey

- Fund raising: BiolMed has to undergo stringent regulatory approvals before commercialization and sale of products. This involves long-term preclinical and clinical trials. Hence, finding a patient investor is one of the challenges we have been facing. BiolMed has identified and tapped into government and other grant funding schemes that are suitable for high-risk biotech companies
- Building the team: The team can either break or make a start-up. Finding the right team members with complimentary skillsets and who share the same passion is always a challenge. More so in our case since we work in an interdisciplinary area consisting of materials, life sciences and bioengineering. The team members





have to also be open to grey boundaries in their roles i.e. they must be willing to take up jobs out of their comfort zones and need to align themselves frequently as per the need of the organization. Thus, we did take a while before we finally decided on our team. We used all possible ways to connect to future employees – internet, social media, networks, word of mouth, etc. Also, we have devised protocols, which enable us to hire consultants who work only part time or on a need basis in the company

Road Ahead

In the next five years, BiolMed will scale up its operations multifold. The company will successfully launch two products in the Indian as well as global market and it aims to acquire a major share in the Indian biomedical applications market

Advice for Budding Entrepreneurs

- A successful entrepreneur must be a visionary, he must be extremely resourceful, must have the ability and courage not only to overcome pitfalls but also to rise above the challenges
- Developing a product is very different from inventing and discovering science in a lab. It is therefore important to identify at the very beginning, which your customer is. Once you have identified the same, discussions with the customer will help you understand the pain points and help you in designing a useful product. A product, however good it might be, if it does not satisfy the customer needs, it will not sell.



Biomoneta Research Pvt. Ltd.

Founder: Janani Venkatraman

Year of Establishment: 2014

Location: C-CAMP, Bengaluru, Karnataka

Annual Turnover: Pre-revenue Stage

Team Members: 4

Area: Medical Devices

Academic Background

Janani is Ph.D in molecular biophysics from Indian Institute of Science and underwent postdoctoral training from Yale University

Motivation to Pursue Entrepreneurship

I previously worked for a large multinational to discover new antibiotics. Large corporations can bring multiple resources and critical mass to bear on a problem, but entrepreneurship allows enormous flexibility to explore multiple solutions very, very quickly. I feel that to be in a position to be able to take quick decisions is invaluable!

Identification of Business Opportunity

We strongly believe that reducing the spread of infection, especially in healthcare settings, is an unmet medical need. Healthcare acquired infections today are a global clinical problem but the major focus has been on the discovery of new antibiotics. Infection management and control need innovations that look at multiple factors. We started Biomoneta with the goal of designing devices that will help reduce the load of pathogenic microbes in the environment, leading to reduction in the spread of infection

Products in the Pipeline

Our products are in the area of infection control and decontamination in healthcare spaces. The products are –

- A bedside device that decontaminates locally to protect vulnerable patients from acquired infections
- A device that can bolt-on to central air handling units and decontaminate large areas

Commercialization Strategy

We are in the process of validating both products in the field. The bedside device is expected to commence in-clinic testing shortly

Mentors

Dr. Anand Anandkumar, Dr. Kaveri Das and Dr. Gautam Das. Dr. Anand and Dr. Gautam Das have decades of experience in building very successful companies from scratch. Dr. Kaveri Das has vast experience in infection biology

Critical Areas for Mentorship

Fund raising, business development and product building



Funding Mobilized

Funds from promoter capital, angel investors and DBT-BIRAC (BIG and SBIRI)

Achievements

- Two DBT - BIRAC grants: BIG and SBIRI
- Funding from KBITS, Karnataka: Ideas2PoC fund
- Patent applications filed with the IPO and PCTO
- Secured investment from and angel investors

Entrepreneurial Journey - Nutshell

We have been able to convince some very talented people to join our journey – be it as employees, investors or as (unpaid!) consultants. This validates our belief in the medical need for our devices. We have been able to show that our prototypes extract and kill very high concentrations of microbes under test conditions. We have partner hospitals that have signed up to trial the device

Lessons from the Journey

We started Biomoneta with a very clear idea of what we wanted to do, but without any in house expertise to completely execute our vision. The first couple of years took us along a steep learning curve, as we learnt how to bring in the required expertise, and how to communicate with people from diverse disciplines. And all this on a shoestring budget! Today, we have built the engineering team, made connections with the regulatory, clinical and funding ecosystem, and set up the testing infrastructure



Road Ahead

We hope to have deployed our bedside anti-infection device in the coming year, as well as a version that can be integrated into central ventilation systems. We hope to have penetrated global markets as well

Advice for Budding Entrepreneurs

It is very important to have the core expertise required to make your product as part of the team as early as possible.



Coeo Labs Pvt. Ltd.

Founders: Nachiket Sharad Deval and Nitesh Jangir

Year of Establishment: 2014

Location: InnAccel, Bengaluru, Karnataka

Annual Turnover: Pre-revenue Stage

Team Members: 7

Area: Medical Devices

Academic Background

Nachiket is B. Ein production engineering and Masters in product design and

Nitesh is B.E in electronics engineering and has done internship with Stanford India Biodesign (SIB) at AIIMS, New Delhi

Motivation to pursue Entrepreneurship

We have been always interested in developing technology for the benefit of the society, during a clinical emersion at a tertiary care hospital, so we came up with a compelling need of solving Ventilator Associated Pneumonia (VAP), which led us to take up the entrepreneurial path to realize this project. Industry data points out that 30 per cent of Indians who are put on a ventilator contract ventilator-associated pneumonia (VAP). Similarly, in rural India, 50 per cent of child delivery happens outside a care centre, typically at least 5-10 kilometres away



Identification of Business Opportunity

The opportunity was identified as part of a structured clinical unmet need finding exercise, wherein an interdisciplinary team comprising of designer, engineer, doctor and business graduate spent 2.5 month in a tertiary care hospital, shadowing doctors and patients to find gaps in the healthcare setting. These needs were further filtered based on incidence, criticality, potential impact, stakeholder understanding and market fit, financial burden due to the problem and current solutions present. The business opportunity was identified as a result of this analysis.

Portfolio

- VAPCare – Intelligent secretion and oral hygiene management solution to reduce the risk of acquiring ventilator associated Pneumonia
- Saans – A multimodal CPAP device for intra and inter hospital transfers which works on manual effort, electricity as well as compressed oxygen, to aid the respiratory function for neonates suffering with Respiratory distress syndrome (RDS)

Products in the Pipeline

- Automatic ambu-bagging (bag and mask respiration) system



- Secretion management system for stroke and paralysed patients

Mentors

Dr. Kristian Olson, Associate Professor, Harvard Medical School, Dr. Ravi Kumar, MD Xcyton Diagnostics, Dr. Suman Rao, HoD, Neonatology, St. John's National Academy of Health Sciences, Mr. Siraj Dhanani, CEO InnAccel and Mr. A Vijayarajan, CTO, InnAccel

Critical Areas for Mentorship

Clinical guidance, concept evaluation, product development and business case analysis

Funding Mobilized

Rs. 6.5 crores in total from DBT-BIRAC, Millennium Alliance (FICCI) and InnAccel

Achievements

- Silver award at MassChallenge, 1 of the top 10 business incubators in US based out of Boston
- Selected as 1 of 16 global innovations to be showcased at American college of Cardiology's (ACC) annual conference, 2015

Entrepreneurial Journey - Nutshell

It has been a journey of about 2.5 years starting from unmet clinical need identification, validation, creating proof-of-concept, building product and creating a commercially viable business case. After bouncing off the idea with doctors, we decided to develop the VAP product. Basically, it is a portable suction machine that is connected to a thin endotracheal tube inserted through the nose or mouth into the patient on a ventilator. Secretions from the mouth and nasal passage often get contaminated with germs.

The machine senses and removes the secretions before they reach the lungs and an external machine-learning interface controls the suction. Using frugal innovation techniques, we hope to bring down healthcare costs by 30 per cent

Lessons from the Journey

The biggest challenge is to find a relevant unmet clinical need which when solved will really create substantial impact to the healthcare system and benefit the patients. This challenge was overcome by undergoing a clinical immersion for 2.5 months to shadow doctors and patients and observe the problems first hand. Once the need was identified, a thorough stakeholder analysis was required to find the actual user, buyer and payer in the system and how the business case could best satisfy all the stakeholders



Road Ahead

In the next 5 years, Coeo Labs intends to be one of the major healthcare start-ups in the field of emergency and critical care devices

Advice for Budding Entrepreneurs

- To have patience and to believe in oneself
- Also, to fail fast so that the corrective action can be taken earlier.



Crimson Healthcare Pvt. Ltd.

Founders: Pranav Chopra, Pradeep Chopra and Abhideep Chaudhary

Year of Establishment: 2015

Location: New Delhi

Annual Turnover: Pre-revenue Stage

Team Members: 3

Area: Medical Devices



Academic Background

Pranav is B.Tech in mechanical engineering from IIT Madras, M.Tech in product design from IIT Madras and M.Phil in industrial systems and manufacturing and management from Cambridge University; Pradeep is B.Tech in mechanical engineering from IIT Delhi, M.Tech in mechanical engineering from IIT Delhi and Abhideep Chaudhary is MBBS from Goa Medical College, M.S in general surgery from Lady Hardinge Medical College and transplant surgery fellowship from University of Pittsburgh



Motivation to Pursue Entrepreneurship

We always had an entrepreneurial inclination. The biggest motivation has been the joy of being able to contribute to society and ultimately the economy by creating value through useful products and also by means of providing employment to others

Identification of Business Opportunity

The idea came about during Stanford India Biodesign fellowship at AIIMS. The fellowship made us go through a rigorous process of need identification, clinical immersion and evaluation. At AIIMS, we were able to understand the problems faced by ostomates with great empathy and our research highlighted the fact that all available solutions for to manage colostomy are poor and ineffective for patients



Product in the Pipeline

SphinX – Colostomy Management System and variants for needs of different kinds of users. SphinX is a continent ostomy device that aims to empower ostomates by helping them regain control over evacuation and provides freedom from the problems inherent to existing standard of care. The port is inserted into the stoma and stays there for an extended duration and does not require any accessories, skin barrier creams, etc. A discreet design conceals its form and shape, giving ostomates confidence and privacy

Commercialization Strategy

We aim to complete development of the ostomy management system and launch the product in India by early 2020



Mentors

Dr. Balram Bhargava (Executive Director – School of International Biodesign, AIIMS), Dr. Rajiv Doshi (Consulting Professor, Stanford University), Dr. Anil Agarwal (HOD GI Surgery, GB Pant Hospital) and Dr. N R Dash (GI Surgery, AIIMS)

Critical Areas for Mentorship

Business, manufacturing and clinical access

Funding Mobilized

Rs. 46 lakhs from DBT-BIRAC (BIG) and Rs. 2.1 crores from Indo-US Science and Technology Endowment Fund

Entrepreneurial Journey - Nutshell

Pranav - I started my entrepreneurial journey in 2011 when I had to leave my job in the UK due to visa issues. I decided to use that as an opportunity to start my own product development consulting practice in India and spent the next year working for foreign and Indian clients (including project with NPCL/ BARC). Though it was exciting and very rewarding, I realised I needed more experience and more education to make a better impact. After another 3 years in industry I pursued the Stanford India Biodesign fellowship which allowed me to take a full-fledged plunge into the start-up world! Since completing the fellowship I founded Crimson Healthcare with an aim to innovate cutting edge solutions for various healthcare problems that can be addressed with advanced engineering and technology. The ostomy management device – SphinX, is a first step towards that endeavour

Lessons from the Journey

Getting funding to make prototypes and test the concept was the biggest initial challenge. It took a long time to finally receive the grants. The other major and continuous challenge is hiring. For startups, it is difficult to match corporate salaries and hence difficult to attract good talent

Road Ahead

We expect to launch our first product in India within the next three years. Our goal for the next five years is to have a full suite of ostomy care products and help at least 50,000 ostomates globally

Advice for Budding Entrepreneurs

Be passionate, collaborate freely, be patient and be prepared to be poor for a while!



Dynasense Technologies Pvt. Ltd.

Founders: Anurag Meena and Anish Kulkarni

Year of Establishment: 2016

Location: Mumbai, Maharashtra

Annual Turnover: Pre-revenue Stage

Team Members: 13

Area: Molecular Diagnostics

Academic Background

Anurag is B.Tech in engineering from IIT Bombay from Anish is B.Tech and M.Tech in mechanical engineering from IIT Bombay

Motivation to Pursue Entrepreneurship

After our third year of engineering, we always wanted to be a part of something



that involves core engineering to develop something for the society. We had been involved in research projects since then and didn't want to just wrap up my projects as just patents and publications. We had the zeal to actually convert them into products that will be useful for the society. The thought of having an impact on human lives is what drives us

Identification of Business Opportunity

Anurag had been working under the guidance of Prof. Rohit Srivastava on smart drug delivery and medical sensing applications. During that time, he acquired a lot of knowledge about bio-chemistry and the scope of applications that can be developed. During his final year, he had discussions with a few clinicians and diabetic patients and later on from my independent study as well. He realized that a huge quantum of money is spent on glucose test strips for glucose management and drug dosage purpose. Moreover, various vendors lock down their meters to their specific test strips for monetary gains. As the diabetic population rises in India is still not insurance backed, this could be a burden on people as well as the Government. So, Anurag and Anish got together decided to work on making a glucometer that does not utilize disposable test strips for each test and provide people with an economic yet quality device for disease prevention and management. We feel proud in being very close to having an indigenously developed sensor for glucose sensing without any consumable strips

Portfolio

We are building a glucose monitoring device that does not use consumables for each test being performed. We want to make it a truly test strip free glucometer. We already have results showing the capability of our sensor that we have built by in-house efforts



Commercialization Strategy

The product is currently in concept stage

Product in the Pipeline

Consumable free glucometer which does not need test strips for each test

Mentors

Dr. Rohit Srivastava, Nanobios Lab, IIT Bombay and Dr. Gautam Shetty, Orthopaedic Surgeon

Critical Areas for Mentorship

Technical and clinical aspects of business

Funding Mobilized

Rs. 45 lakhs from DBT – BIRAC (IIPME)

Achievements

- Secured IIPME grant from BIRAC for development of product
- Awarded First Prize in technical presentation at Grand Challenges India Meeting, New Delhi, 2017

Entrepreneurial Journey - Nutshell

We have been able to assemble a team of 13 people in less than a year from starting off in 2016. Our team includes a set of interdisciplinary people having educational backgrounds ranging from B.Tech's to PhD's. We have also formed partnerships with clinicians. On the product front, we are getting good results and have even identified further potential applications of our sensing platform

Lessons from the Journey

One of our key challenges has been finding the right set of people for the team. We have been fortunate enough to build a strong core technical team very early in our journey. But as we progress, hiring talent is a bit of challenge

Road Ahead

In the next five years, we foresee the company providing our consumable free devices globally. We would also be identifying a couple of other real world challenges and thrive to solve them using our team's combined intellect

Advice for Budding Entrepreneurs

From our journey so far, we have identified the following crucial points:

- Start only when you are ready to face the ups as well as downs of the journey. It isn't as glamorous as it looks from the outside or from media reports. Having said that it indeed is very exciting, adventurous and a great experience which you cannot get from reading or watching someone
- Take time but choose your initial partners and team carefully. Finding the initial partners is analogically like a marriage. You'll be there in for a long and should have people with contrasting skills and attitude. Your vision should align but you need not be each other's yes-man.



Indio Labs Pvt. Ltd.

Founder: Siraj Bagwan

Year of Establishment: 2013

Location: Bengaluru, Karnataka

Annual Turnover: Pre-revenue Stage

Team Members: 13

Area: Medical Devices



Academic Background

Siraj is Master of Design from Indian Institute of Science, Bangalore and Stanford India Biodesign fellow at AIIMS New Delhi and Stanford University, USA

Motivation to Pursue Entrepreneurship

When an individual spends couple of months at AIIMS experiencing the helpless state of patients with a disease state, observing the procedures, complications and patient outcomes, he/she definitely gets motivated. The entrepreneurial venture gives me an opportunity to contribute in improving healthcare, to reduce complications and pain or simply put a smile back on the faces of patients. Coming from product design background, I have engineering skills to identify opportunities for interventions, develop solutions that could make a business



Identification of Business Opportunity

I observed a complex procedure of liver biopsy at AIIMS and studied the complications associated with it. I felt that we could make this procedure a little safer than the present standard of care so that the gold standard procedure could be deployed for many people who do not get the procedure due to its complexity. I studied the need and evaluated it further

Portfolio

Soft-tissue biopsy system which is designed for making the gold standard biopsy procedure safer for five organs; liver, kidney, breast, lungs and prostate. The system will enable physicians to achieve safer and definitive tissue capture using advanced needle-tissue characterisation and automated control.

Commercialization Strategy

We are currently at the mould development and process validation phase after which we will take our product for clinical validation phase

Products in the Pipeline

Bone/bone marrow biopsy system and interventional devices

Mentors

Dr. Balram Bhargava, Dr. Rajiv Doshi and Mr. Subu Goparaju



Critical Areas for Mentorship

For any startup, developing a product is the first challenge and developing a market is the second challenge. However, market development is a bigger challenge which is critical to any business for its sustainability

Funding Mobilized

Rs. 5 crores funded internally from founders capital and holding company

Achievements

- Filed 3 patent applications
- Completion of engineering design

Entrepreneurial Journey - Nutshell

We have completed the engineering design of the device for all five soft organs. We have also successfully completed the needle-tissue characterisation and operating parameters for the device

Lessons from the Journey

It is crucial to understand the strategy of raising capital and requirements of products

Road Ahead

We plan to market the device in mid of 2018. The second half of 2017 would be dedicated to a pilot study in 5-6 hospitals and then we would do a market launch with a commercialization partner

Advice for Budding Entrepreneurs

- Believe in yourself and in your abilities
- Take calculated risks
- Fail early and learn from every failure.





JC OrthoHeal Pvt. Ltd.

Founder: Pankaj Kumar Chhatrala

Year of Establishment: 2015

Location: Vadodara, Gujarat

Annual Turnover: Pre- revenue Stage

Team Members: 7

Area: Medical Devices



Academic Background

Pankaj is MBBS, Masters in medical science and technology from IIT-Kharagpur and Stanford India Biodesign Fellow

Motivation to Pursue Entrepreneurship

As physician, I always liked to help people, relieve their pain and help them become healthier. After completion of my MBBS, I chose my career path towards developing medical technology inventions. I believe, through such inventions, I can help the doctors in providing better healthcare



Identification of Business Opportunity

The business opportunity was identified through the extensive clinical immersion I went through as part of biodesign fellowship



Portfolio

FlexiOH: A washable, breathable, lightweight cast immobilization for fractured bone and injured joints

Commercialization Strategy

After successful clinical validation, we will scale up manufacturing and start distributing in India. We shall also look forward to marketing in other countries. Currently, we have consulted more than 50 orthopaedic surgeons about FlexiOH. So far, we have received positive response and they are excited to adopt FlexiOH. However, few surgeons have raised concerns about higher price of FlexiOH (which is 30% higher than glass fiber cast). Hence, we are

carryingout material research to reduce manufacturing cost. We plan to bring FlexiOH in next 6-8 months to the market

Mentor

Dr. Prashant Jha, Fellowship Director, SIB, AIIMS



Critical Areas for Mentorship

Strategy and implementation

Funding Mobilized

Funds from DBT – BIRAC (BIG) and promoters capital

Achievements

- BIRAC- SRISTI Gandhian Young Technological Innovation Award, 2015
- BIRAC- SRISTI Gandhian Young Technological Innovation Grant, 2015
- Gold- medal DST- Lockheed martin Indian Innovation Growth program, 2016
- IC2 Business commercialization support from IC2 institute- University of Texas- USA for being in top 8 technology under DST- Lockheed martin Indian Innovation Growth program, 2016
- IUSSTF Silicon valley delegate visit for being in top 10 technology under DST- Lockheed martin Indian Innovation Growth program, 2016
- Top-10 Promising start-up CII – Industrial Innovation Award, 2016



Entrepreneurial Journey - Nutshell

My technology and start-up has been recognized by national awards and grant programs. FlexiOH has been tested on bench-top testing and ready for clinical evaluation. In parallel, we are planning for pilot scale production and subsequent commercialization

Lessons from the Journey

Prototyping: It was difficult to find prototyping facilities and vendors for silicon rubber parts in India. We have developed in-house facilities for silicon rubber prototyping

Road Ahead

We envision OrthoHeal to be the market leader in Splinting and Casting in India in next five years

Advice for Budding Entrepreneurs

- Before starting: Have healthy and clear discussion with prospective co-founders to align interest for long period of time. That will reduce chances of co-founder clashes and emotional exhaustion
- Boot strap as long as possible: being an entrepreneur it's your duty to continue fuelling your start-up with continuous fund. However you have to balance fund requirement and progress to avoid rapid dilution of equity before product maturation
- Learn core activities i.e. manufacturing of key component of product, and keep it in-house instead of contract manufacturing.



Jeevtronics Pvt. Ltd.

Founders: Aniruddha S. Atre, Ashish S. Gawade and Sreeram Dhurjaty

Year of Establishment: 2013

Location: Venture Center, NCL Innovation Park, Pune
Maharashtra (non-resident incubate)

Annual Turnover: Pre-revenue Stage

Team Members: 6

Area: Medical Devices



Academic Background

Ashish and Aniruddha are B.E from University of Pune, M.S from Wayne State University, MBA from Ross School of Business in Ann Arbor, Michigan and Sreeram is Ph.D in biomedical engineering from IIT Bombay

Motivation to Pursue Entrepreneurship

Our motivation has been to create social impact for the bottom of the pyramid. Ashish and Aniruddha are serial social and technology entrepreneurs. They have always applied technology for developing solutions for rural India

Identification of Business Opportunity

The business opportunity was identified by extensive market research before and after forming the company which helped in assessing the market opportunity. India's death rate due to Sudden Cardiac Arrest is 3 to 4 times that of developed countries. We tried to find out about defibrillators: Who needs the product? Why? How/ Where will they use it? At what price point will the customer buy?

Portfolio

World's first hand cranked defibrillator. This will significantly improve access to defibrillators to a huge portion of the world, which does not have electricity

Commercialization Strategy

The product is in development stage and may be launched next year

Products in the Pipeline

More defibrillators (automatic) and defibrillator analyzers. In addition, the platform technology will enable us develop other products and enter various market segments

Mentors

Dr Raghunath Mashelkar and Dr V Premnath

Critical Areas for Mentorship

Commercialization, distribution of medical devices, patent strategy, legal and fund raising





Funding Mobilized

Funding from DBT – BIRAC (BIG), DBT – BIRAC & MeitY (IIPME) and Indo-US Science and Technology Forum

Achievements

- DBS 50 Cohort, 2017
- 1st eN-ABLE Startup Award, Medical devices, from ABLE, 2016
- Finalist (Top 6) at Social Venture Challenge Asia, Singapore, 2016
- Runner up at Sankalp Global Summit, 2016
- Won the Indo-US Science and Technology Fund grant, 2016
- Won 2nd prize at the Tata Social Enterprise Challenge at IIM-Calcutta, 2016
- Won 1st prize at the lightning pitch competition at the International Knowledge Millennium Conference, 2015

Entrepreneurial Journey - Nutshell

It started with a simple idea that defibrillators must be made available in rural areas where there is lack of electricity. Later, the team came together- two social & technology entrepreneurs, a medical device veteran, great employees, mentors, friends, etc. We have developed a proper prototype, which will go to production shortly. Extensive durability testing has been done already and we are confident that the product will last for decades. This will be the first defibrillator, which works in areas without electricity and costs one fourth of the big brands yet have high quality. We are preparing to start manufacturing and distribute the product in India and other developing countries in Asia, Africa, South America and some select segments in the developed countries

Lessons from the Journey

Hiring the right people was a challenge. We eventually learnt to hire the right people. Finding people with right attitude is more important than only technical skills

Road Ahead

We are working hard to ensure that the death rate in all developing countries like India is reduced by 3-4 times compared to present levels. We would love to see our product become an enabler to achieve this and target every developing country

Advice for Budding Entrepreneurs

- Stay on the course
- Get good mentors
- Don't be afraid to make mistakes but learn quickly. Move fast
- Innovate not only on technology front but also on other fronts like HR, resource deployment, and finding the right resources
- Help others and don't hesitate to ask for help.





Module Innovations Pvt. Ltd.

Founders: Sachin Dubey and Usman Khan

Year of Establishment: 2014

Location: Venture Center, NCL Innovation Park, Pune, Maharashtra

Annual Turnover: Pre-revenue Stage

Team Members: 6

Area: Molecular Diagnostics



Academic Background

Sachin is Integrated M.Tech in nanotechnology from University of Rajasthan and Usman is B.Tech and M.Tech in biotechnology from University of Rajasthan

Motivation to Pursue Entrepreneurship

We come from Rajasthan - land known for the spirit of entrepreneurs. More than that, lack of affordable healthcare and an inequitable medical structure made us think of science based entrepreneurship. India has almost a third of the population living below poverty line, which is a staggering figure. While working at National Chemical Laboratory Pune, we realized the potential of our technology to impact lives and hence we plunged into entrepreneurship, leaving other lucrative opportunities that we available to us



Identification of Business Opportunity

Module, which began as a social impact startup, soon understood the potential of its technology. Not only was it affordable in a rural setting, the ease of use and quick results garnered immense attention in urban settings. With carrying out surveys in hospitals and pathology labs in Jaipur and Ahmedabad, we realized that the business opportunity was huge. We talked to potential customers to ascertain the business opportunity

Portfolio

- EcoSense: Rapid and colorimetric strip for detection of E.coli in water and food in 30 – 60 minutes
- USense: Affordable, rapid and point of care detection of uropathogens causing Urinary Tract Infections in 60 minutes

Commercialization Strategy

Presently, the products are under the validation stage. We are targeting hospitals to work through business to customer (B2C) system

Product in the Pipeline

CSense: Easy to use, colorimetric and point of care strip for early screening of cervical cancer.

Mentors

Dr V.Premnath, Director, Venture Center and Dr S.Britto, Assistant Professor, IISER Pune



Critical Areas for Mentorship

Business strategy and chemical biology

Funding Mobilized

Rs. 1.30 crores as grant and seed investment

Achievements

- Awarded Longitude Prize Discovery Award, 2017
- Part of part of the top 50 innovators India Innovation growth programme
- Most investible startup of the year (prototype stage) at Clarion Call 2.0 organized by IIM-Calcutta, at MCA, Mumbai, 2017
- Investment by NSTEDB, 2017
- IIM-Ahmedabad, CIIE Healthcare Accelerator, 2016
- Unitus Seed Fund-StartHealth 3-Winners, 2016
- Second Prize for poster in the Diagnostics category and 3rd in the lightening pitch at IKMC 2015-ICICI Knowledge Park, HICC, Hyderabad, 2015
- Selected in top 12 to present to the Affordable Healthcare India global committee of the Wellcome Trust, at London, UK, September 2015
- Third Prize in the Business category at Governors Giant Vision competition, Sioux Falls, USA
- Awarded Rs. 50 lakhs by BIRAC and DBT, Govt of India
- Awarded 1 position at the South Dakota School of Mines and Technology, USA 2014 B.Plan competition, 2014
- Second Prize for poster in the Diagnostics category at IKMC 2014-ICICI Knowledge Park,HICC, Hyderabad, 2014
- Eureka 2014-IIT B,DST, Intel: Finalists in the Business and Social track
- Live B.Plan-KBITS, Govt. of Karnataka:Finalists
- NCL-RF Directors fund:Received Rs 5 lakhs
- ABLE-BEST:2012; Awarded runners up prize and Rs 3 lakhs at ABLE-BEST, 2012

Entrepreneurial Journey - Nutshell

The entrepreneurial spark was ignited when we won ABLE BEST 2012 in college. Since then, the journey has been a roller coaster ride with its highs and lows. Our journey began in 2014 at a time where we had no funds upto 7 months. It was tough, but the initial hardwork paid off. Since then we had tasted success at many forums as we completed the proof of concept through a grant from BIRAC followed by numerous awards. We raised more funds and added products to our portfolio. We expanded the team at Module which started as a 2 member startup. The efforts were totally rewarded when recently Module received the most investible startup of the year 2017 in prototype category at Clarion Call 2.0 organized by IIM-Calcutta

Lessons from the Journey

- Entrepreneurial journey is tough, but is fun if you are passionate and determined. Do not pursue this path unless you are extremely motivated
- Never be too obsessed with your idea. Be open for suggestions and ready to pivot if it seems a better option rather than spending too much time



- Build a team of like-minded and equally passionate people. Look for co-founders who share the same passion and vision as you do. Decisions like equity splitting should be taken after you have some experience and know your roles very precisely to avoid future conflicts

Road Ahead

Module has been pacing fairly well in its journey so far. We have done proof of concept for 2 products and have begun our research on a pipeline product. As our product line gets validated and new products roll out in the market, we foresee a bright future. Our products can create impact on all strata of population, irrespective of their location or financial situation. We believe that Module will have a global presence

Advice for Budding Entrepreneurs

There is no formula for being a successful entrepreneur as any entrepreneur who becomes successful might have his or her own 'fundas'. Few things though could help you as it helped us:

- Identify your Passion: You have to be extremely passionate and determined in what you do. Remember entrepreneurs are willing to work 80 hours a week to avoid working 40 hours a week
- Keep Reading: Constantly update your knowledge with what is going on around. Great entrepreneurs are also voracious readers
- Find Great Mentors: Be with people who inspire you. Find good people who you believe are successful and can guide you. Don't be hesitant to approach them
- Be Shameless: With a pinch of caution, I say entrepreneurs are shameless. They get their work done by all fair means, which is the only thing that matters in the end
- Enjoy your success: Celebrate your success be it small or big. Remember God will give you more chances to celebrate if you celebrate success irrespective of its magnitude. Share your success with your team
- Believe in yourself: The most important things are often said at the last. Have immense faith and belief in yourself. If only you believe in yourself, your investors and your team will believe in what you say and what you do.



Mother Diagnostic Systems Pvt. Ltd.

Founders: Karthik Somasundaram and Arun Somasundaram

Year of Establishment: 2013

Location: Bengaluru, Karnataka

Annual Turnover: Pre-revenue Stage

Team Members: 3

Area: Medical imaging



Academic Background

Karthik is B.Tech from SACS Madurai and M.Tech in VLSI from MGR, Chennai and Arun is M.Sc in software development and PGDM from IIM Calcutta

Motivation to Pursue Entrepreneurship

The motivation behind pursuing entrepreneurship lies in an incident which intrigued me to become an entrepreneur. I had small injury in my leg and I went to a nearby clinic. The doctor asked me to take X-Ray of the injured region. I went to the diagnostic centre which was about to close. I went next day, and the X-Ray was taken. Two days later, I collected my reports. By the time I reached the doctor with my reports, my injury had healed quite much. I wondered, if the doctor had low-cost digital X-Ray in her clinic, she could have provided immediate diagnosis. This led me to think of designing "Low cost Digital X-Ray"

Identification of Business Opportunity

The need for a low cost machine in the market which would make it easier for people to get an X-Ray done motivated me to develop such a product for the market

Portfolio

X-ray machines that can be used for general radiology, mammography, bone densitometry etc.
Features of our product-

- It costs just Rs. 8 lakhs whereas conventional Digital X-ray costs up to Rs. 38 lakhs
- It has better image resolution - 6 LP/mm, while conventional Digital X-Ray - 4 LP/mm
- It is also relatively safer, as effective X-Ray dosage required is 50% less compared to conventional Digital X-Ray



Commercialization Strategy

The product is in development stage and may be launched next year



Product in the Pipeline

Low cost CT-scan

- It costs Rs 15 Lakhs which is lower than the average CT scan
- It is relatively safer as effective dosage is also less

Mentors

Mechanical and clinical mentors

Critical Areas for Mentorship

Synchronization and Image validation

Funding Mobilized

Rs. 46 lakhs from DBT – BIRAC (BIG)

Entrepreneurial Journey - Nutshell

The awards which we kept receiving throughout our journey were a consistent motivation to keep working towards our goal and create a successful product

Achievements

- TiE-Villgro - Impact-a-prenuer of the year, 2014
- DST-Lockheed Martin - India's top ten innovations
- India-UK tech cooperation - DEVTECH award for social enterprise

Lessons from the Journey

The challenges faced by us were obtaining seed fund and specialized technical knowledge related to dosage calculation and X-Ray generator. We overcame our challenges through receipt of BRIAC grant and meeting with equipment vendors

Road Ahead

- We aim to be Rs. 500 crores company in 5 years
- We aim to sell X-Ray equipment in Brazil, South Africa, Cambodia, by 2020

Advice for Budding Entrepreneurs

- When product is in idea stage, approach government agency rather than venture capitalists for funding
- Planning is more important than plan itself
- Team with all kinds to skill is not must for success, it is certainly possible to grow team as company matures.



Orthocrafts Innovations Pvt. Ltd.

Name: Piyush V Joshi, Ashish Lele and V Premnath

Year of Establishment: 2014

Location: Venture Center, NCL Innovation Park, Pune, Maharashtra

Annual Turnover: Pre-revenue Stage

Team Members: 6

Area: Biomedical Implants



Academic Background

Piyush is B.E from University of Pune and PG Diploma in IPR from Nalsar University, Hyderabad, Ashish is Ph.D from University of Delaware and V Premnath is B.Tech from IIT Mumbai and Ph.D from MIT, Boston

Motivation to Pursue Entrepreneurship

Our heavy dependence on foreign countries for healthcare products and services fetched our attention to use our technology and knowledge. Our passion to solve important problem for our nation and its people using knowledge based solutions pushed us to pursue entrepreneurship



Identification of Business Opportunity

It began when an orthopaedic surgeon approached us to seek our help in developing an implant used for one the surgeries. While doing our background search, we became aware of the bigger need for developing "Make in India products in affordable manner"

Portfolio

Currently, we are working on 3 important products –

- OrthoScrew (bioabsorbable screw for ACL reconstruction)
- OsteoAnchor (bioabsorbable suture anchor for shoulder, ankle, elbow and knee soft tissue reconstruction)
- OsteoTack (bioabsorbable tacks for attach mesh to soft tissue)

Commercialization Strategy

We plan to collaborate with an orthopaedic device maker for introducing the product in the market in Pune. This company has introduced various other companies in the market including a brand from USA

Products in the Pipeline

3D printed custom products for maxillofacial surgery



Mentors

Dr S. Sivaram

Critical Areas for Mentorship

Developing products of global quality in affordable manner and mechanism to take the products to market

Funding Mobilized

Rs. 48 lakhs from DBT – BIRAC (BIG), Rs. 7 lakhs from Venture Center and Rs. 5 lakhs from personal savings

Achievements

- Applied for 4 trademarks and a patent in India
- Featured in Biospectrum as promising start-up in the field of Medical devices

Entrepreneurial Journey - Nutshell

While company faced many challenges from technology transfer to skilled manpower to accessing clean room facilities, we have been able to develop a minimum viable product of 'Orthoscrew'. We are in the process of developing the clinical trial protocol for the product

Lessons from the Journey

Orthocrafts is unique in terms of a company structure, where scientists from CSIR are allowed to take equity and be a promoter of the company. Orthocrafts is amongst the first few start-ups where CSIR's "Scientist Entrepreneurship Scheme" has come to fruition. So far, Orthocrafts has been successful in starting a new trend amongst scientists, who wish to shift from traditional technology development and transfer model. It is highly essential that all co-founders of the company should work in coherence and understand their roles very clearly. Lessons of the journey are-

- Choose your product very wisely
- Do not waste even a minute once the path to achieve goal is clear
- Choose your funding partners carefully and after complete due diligence
- Never hesitate to take risks

Road Ahead

In next 5 years, we wish to establish Orthocrafts as a most promising company in the space of affordable medical devices. We plan to build the products that will have globally acceptable quality and commercialize at least 2 products

Advice for Budding Entrepreneurs

I would like to advise young entrepreneurs who are thinking of starting their own venture, they should –

- Choose your products carefully
- Not hesitate to take risk
- Do lot of networking
- Last but not least always aim high.



Pandorum Technologies Pvt. Ltd.

Founders: Tuhin Bhowmick and Arun Chandru

Year of Establishment: 2011

Location: C-CAMP, Bengaluru, Karnataka

Annual Turnover: Pre-revenue Stage

Team Members: 12

Area: Tissue Engineering and Regenerative Medicine



Academic Background

Tuhin is Ph.D from Department of Physics, Indian Institute of Science, Bangalore and Post-Doctoral fellow from European Molecular Biology Laboratory, Deutsches Elektronen Synchrotron, Hamburg and Arun is Ph.D from Department of Aerospace Engineering, Indian Institute of Science, Bangalore



Motivation to Pursue Entrepreneurship

Tuhin - For me science is a way of life. I grew up in a family of doctors and was very used to hearing scientific discussions at the dinner table. My mother encouraged my interest by giving me books to read like “100 important discoveries”. But I wanted to be a detective! In my mother tongue, “detective” translates as “the one who is searching for the truth”, and in effect that is what we do as scientists. Every day we follow the principles observe, analyse and understand. There is a powerful expression: “to understand is to transform what is!” and the people who inspire me most are not only great scientists, but those who also manage to bring their science to people. There is no rule that all science has to have an application, but if there is scope to do so I think it’s our responsibility to facilitate that.

Driven by this line of thinking, I cofounded the startup, Pandorum Technologies Pvt. Ltd., with Arun, a friend and colleague from Indian Institute of Science. We started with an innovation in ‘smart’ biomaterials- by understanding how proteins are built we wanted to see if it was possible to build a collection of ‘molecular Lego bricks’ and design a smart, functional material. In the beginning, this was basic scientific exploration, but then we wondered if it was feasible to use our method as ‘ink’ for 3D printing of human tissues and using living cells we printed part of a functional liver. The great hope is that this research could one day lead to products and services which will help the process of drug development, tissue engineering and regenerative medicine - in making implants, hybrid devices, transplantable organs, to elevate the quality and extend the quantity of life. Pandorum’s platform will also provide means to study, control and monitor the complexity of tissue/ multicellular structures. There is still a lot to figure out, but it has been an exciting journey so far. Entrepreneurship really complements my academic work here in Hamburg and in the end – even if things don’t work out – it has been an enjoyable and fulfilling journey

Identification of Business Opportunity

Business opportunity was first identified during brainstorming sessions with Arun and other colleagues at Indian Institute of Science in 2010. Further, BEST(Biotechnology Entrepreneurship Student Team) 2010 competition



helped to fortify the initial belief. Early mentors like as a platform technology with multiple product/ service pipelines. From BEST 2010 to Biotechnology Ignition Grant (BIG)-2012 by DBT - BIRAC and further on, the business model was gradually refined. On establishment of proof of principle, timelines were further revised with respect to product feasibility in short-term goals (2- 3 years) and long-term goals (5 years or more)

Products in the Pipeline

At Pandorum, our goal is to develop a technology platform for tissue-engineering applications. Since its establishment in 2011, Pandorum has travelled a long path of innovation and development of technology platform that could provide means for 3D printing functional human tissues/ organoids using cells encapsulated in bio-mimetic materials as 'ink'. Recently at Pandorum, we have successfully 3D printed a functional liver organoid that expresses the important genomic and proteomic markers, key to the function of a real liver. Such organoids could be used for on-chip analysis of drug toxicity, discovery and screening using humanized systems, circumventing the time and cost expensive animal trials. The future applications of this technology are in implantable device and regenerative medicine. Lab grown organs could become a promising, life-saving candidate to fill the supply-demand gap of organ transplant. The company uses its proprietary technology platforms to design and manufacture functional, three-dimensional living human tissues; intended for medical research, therapeutic and other applications.

- Our first focus in tissue engineering has been to manufacture a durable liver organoid platform, which involves placement of liver cells in an extracellular matrix-like biomaterial using 3-D printing. Pandorum holds IP rights for these advanced biomaterials. Such in-vitro 3D human liver tissues are viable and functional for more than three weeks enabling medical research (hepatotoxicity and drug discovery). This platform is also the basic building block for devising disease models and bio-artificial liver (ex-vivo and in-vivo)
- Additionally, Pandorum is also working to develop 'liquid' cornea to repair corneal injury, which is a major cause of blindness in India

Mentors

Dr. Steven Sammut, Dr. Vijay Chandru and Dr. Satya Dash

Critical Areas for Mentorship

Technical, strategic and business model development

Funding Mobilized

Funds from DBT – BIRAC (BIG and SIBRI), seed investment from Flipkart cofounders Binny Bansal & Sachin Bansal, friends and family

Achievements

- First prize at All India Biotechnology Entrepreneurship Student Team (BEST) Contest-2010, organized by Association of Biotechnology Led Enterprises (ABLE) and Department of Biotechnology (DBT), Govt. of India, 2010
- 'Ignite' entrepreneurship fellowship by BIRAC and Judge Business School, University of Cambridge, England, 2013
- Second prize for poster presentation at "International Knowledge Millennium Conference: Innovating to Improve Lives"- by IKP Knowledge Park, 2014
- "BioExcellence Award" in Biopharma and Healthcare sector by the Department of IT-BT and S&T, Govt. of Karnataka, 2016



- Top 10 startups creating Artificial organs in the world; by medicalstartups.org, 2016
- Featured in Forbes Asia '30 under 30' list: Discovering Brave New Worlds in Science and Healthcare, 2016
- Pandorum's work "3D bio-printing of in-vitro functional human liver tissues", presented in Conference on Bioprinting & 3D Printing in the Life Sciences, held at Singapore General Hospital, 2016
- Pandorum's work on "3D liver tissue as tool for medical research", presented in "the Liver Meet", a prestigious peer-reviewed conference conducted by the American Association for the Study of Liver Diseases, in Boston, 2016
- Pandorum part of France-India Healthcare summit, 2017
- Pandorum part of India Startup Pavilion in BIO International Convention & Exhibition, 2017

Entrepreneurial Journey - Nutshell

At Pandorum, we have been able to identify this path, have built a capable interdisciplinary team of scientists, engineers and doctors and raised fund to gather resources/ infrastructure through last six year. Tissue engineering is a field with high entry barrier, and we have been able to circumvent that.

At Pandorum we have demonstrated how "Innovate in India" can be used as a lower cost model without compromising on quality, than that can be built in a developed nation from bottom up. This was possible mainly due to early stage support from Government grants, soft access to high quality instruments at academic research institutes and incubation centers and maintain and excel at serial innovation. It is crucial to attract and retain high quality manpower. More so in specialized fields like stem cells, bio-engineering, bio-materials, microfluidics etc. Further, a well networked ecosystem niche of entrepreneurs, investors, scientists and govt. officials has fostered Pandorum into an entity driven by continuous innovation and growth.

Currently, Pandorum has developed 3D printed mini-liver tissues to discover and develop better drugs at lower costs. Pandorum's mini liver are developed for pre-clinical trials to expedite the drug development process, which otherwise takes between six to twelve years for a single drug at a cost of \$3-5 billion on average. At Pandorum, we are planning to do beta testing with pharma companies for the mini-liver tissues and pilot human trial for cornea within the span of 2017-2018. Further, since animal testing is getting banned in Europe and other countries for FMCG/ Cosmetics products testing, these lab-grown tissues generates huge opportunity. The mini-organs/ organoids developed in this stage will build the platform for hybrid life support devices like bio-artificial liver in near future. The other pipeline of Pandorum is on bio-engineered cornea in collaboration with a leading eye hospital in India, and is planned to reach human pilot trial by 2018-2019. If successful, Pandorum's products and services will elevate the quality and extend the quantity of many lives. Pandoram has signed MoUs with two leading institutions -the National Center for Biological Sciences (NCBS) and L.V. Prasad Eye Institute, Hyderabad. We are currently in advanced stage of discussion with the National University Hospital, Singapore to develop a bio-artificial extra-corporeal liver support device

Lessons from the Journey

There are multiple cases where an entrepreneur has to face the 'chicken and egg' situation. It is always easier to arrange funds when one have achieved a 'convincing' result either the proof of concept, first working prototype or proof of commercializability. The key is to overcome the first hurdle of the sequence. It is true for hiring and building a capable team as the team is another crucial element.

The initial challenge was overcome with the help of





platforms where we could display our concept and its potential, such as BEST (Biotechnology Entrepreneurship Student Team) 2010, organized by ABLE. Following that, BIG-2012 played a critical role in proof of concept generation. From then onwards, the rest of the journey has been crafted with strategic milestones and value generation points, with every step inching towards the final goal- to generate products (and/ or a service), that can help people

Road Ahead

Our business model is that we take molecules/ formulations from customers (pharmaceuticals, FMCG etc.) and carry out the tests in-house at Pandorum and deliver the results. We work in a DSIR approved lab for R&D work and are in the process of acquiring cGMP and related regulatory approvals for this in-vitro application. In the longer timescale, wherein these liver tissues/organoids will be used for transplantation, we would be going through the standard process of pre-clinical and clinical trials. Pandorum is a pre-revenue startup company. Such a venture in the area of tissue engineering demands a higher incubation time, longer time-scale R&D, intellectual property, multi-disciplinary entry barrier etc. that we have traversed, and have progressed towards commercial evaluation by notable potential customers. We envision that the hepatotoxicity screening platform and patient derived organoids for cancer medicine testing to receive proof of commercialization within coming two to three years. In two years, the liquid cornea will reach first human pilot trial. The bio-artificial liver should be in large mammal trial in three to five years

Advice for Budding Entrepreneurs

- To observe, analyse and understand
- A combination of hard work, unbiased thinking and perseverance
- To not give up- and experts could be wrong!
- Be pragmatic about success or failure. Being able to have an unbiased third person perspective helps to perform and accept constructive criticism
- Aim for a product or service that is substantially better in terms of value generation to the end users with respect to the comparable ones available. But at the same time, to realize that perfection is a work in progress.



SciDogma Research and Scientific Networks Pvt. Ltd.

Founders: Satya Tapas, Preeti and Deepesh Nagarajan

Year of Establishment: 2015

Location: C-CAMP, Bengaluru, Karnataka

Annual Turnover: Pre-revenue Stage

Team Members: 7

Sector: Medical Devices



Academic Background

Satya and Preeti are Ph.Ds and Deepesh is pursuing his Ph.D

Motivation to pursue Entrepreneurship

All founders were engaged with basic science research and there was no prior plan to start a company. Two years ago, while using robotics and automation in various research activities, we realized that such technology can be replicated for diagnostic purposes particularly for microscopic based diagnosis and it could be implemented where human resources are limiting. Further, we tried to develop a prototype to check the feasibility of the idea. Few preliminary results were promising and excited us to take it forward. At that moment, startup funding opportunity from Government like BIG scheme also encouraged to start such innovative project

Identification of Business Opportunity

The team realized that the design of optical microscopes being used in clinical labs is more than two hundred years old. Further, it requires skill and human expertise to operate them. Such challenges inspired us to find an opportunity to develop automation in microscopy so that it can be used without expertise. Further artificial intelligence (AI) in particularly microscopy based diagnosis is emerging globally. Such innovation would be the ideal platform to support AI based diagnosis

Portfolio

Computer Numerical Controlled (CNC) Microscope for clinical diagnosis

Products in Pipeline

We are working in the area of diagnosis and drug discovery. Our next product shall be nucleic acid based detection of cancer and various infectious diseases

Mentors

Prof. MRN Murthy, IISc Bangalore and Prof. Bharadwaj Amrutur, IISc Bangalore

Critical Areas for Mentorship

Technology development

Funding Mobilized

Funds from DBT- BIRAC (BIG)



Achievements

- Awarded DST-Lockheed Martin Innovation Award 2016, Stanford Medicine X runner-up Award, 2016
- Awarded Top ten enterprize in Tata Social Enterprize Challenge 2017
- Awarded 7th MT Healthcare Award, 2017

Entrepreneurial Journey - Nutshell

We have successfully developed the functional prototype of our first product – a handheld automated microscope called as computer numerical controlled (CNC) microscope that can be used for education and clinical diagnosis purposes. The innovation has received lot of attention across the globe and this technology is recognized as one of the emerging technology in healthcare that could impact significantly to improve healthcare service in low resource settings



Lessons from the Journey

For our project, early funding was not sufficient to run a completely cross-disciplinary research project as expenses for manpower were limiting. It was merely impossible to hire any experienced candidate to work in the project. We mostly hired students to work part-time in the project. All team members were personally motivated to develop the new life-saving technology that could have significant impact in healthcare despite of sub-par compensation. It is extremely important to hire team members with similar mind-set for cooperative teamwork

Road Ahead

We are excited that several schools and colleges in India are using our indigenous low-cost microscopes as part of their education to enjoy the beauty of microscopic world. Further, we are developing cloud based platform to operate CNC microscope so the rural hospitals and healthcare centres can be connected to city hospital (tertiary) for microscopic investigation leading to immediate diagnosis. We are hoping that it may impact healthcare services particularly in low resource settings significantly

Advice for Budding Entrepreneurs

- Stay starved that keeps you motivated
- Right team members with appropriate skills are essential to run a start-up as resources are limiting
- Never stress yourself with financial constraint. So, play wisely to keep funds ready to sustain for long term go. Keep next round of funding ready before all your money drains away, so that you can hold your core team member who contributed significantly for your project.



Sensivision Health Technologies Pvt. Ltd.

Founder: Jayadeep Unni

Year of Establishment: 2015

Location: Bengaluru, Karnataka

Annual Turnover: Pre-revenue Stage

Team Members: 5

Area: Medical Devices



Academic Background

Jayadeep is M.S in biomedical engineering from New Jersey Institute of Technology, US and MBA in finance & entrepreneurship from Santa Clara University, US

Motivation to Pursue Entrepreneurship

After working in the medical device industry in US for 15 years for companies like St. Jude Medical, Robert Bosch Tele-health Systems, I decided to move back to India to solve local challenges in healthcare in India. Extensive interaction with doctors, healthcare providers and policy makers helped me in deciding to focus on newborns



Identification of Business Opportunity

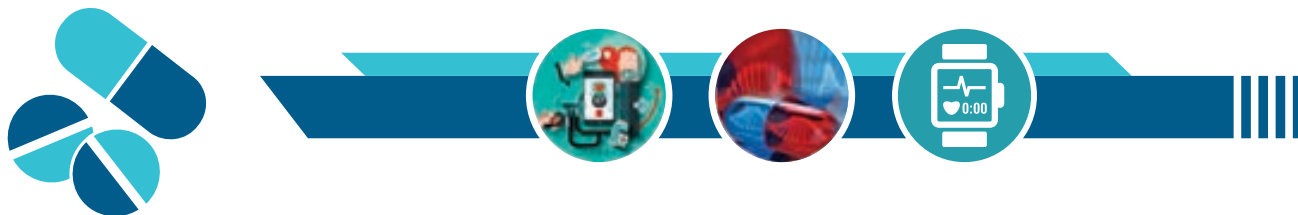
An extensive 'Clinical Immersion' at various hospitals in Bengaluru and Primary Health Centers in the outskirts of Bengaluru helped narrow down on the problems to focus on in our business. Subsequently, need validation across a few states and cities enabled in deciding the focussed problem. We picked up the need to devise a solution to treat a birth asphyxia complication called Hypoxic Ischemic Encephalopathy that damages a newborn brain resulting in high rates of mortality and morbidity

Portfolio

Device to treat Hypoxic Ischemic Encephalopathy (HIE) in Neonates: Our device is to treat birth asphyxia complication in neonates. Birth asphyxia complication results in over half a million cases of mortality and morbidity in India. The complication is results in large number of the afflicted babies either dying or suffering serious brain damage resulting in lifelong disabilities. Our device is clinically effective, affordable and accessible. Since many babies with HIE are born in rural settings, portability aspect of the device enables it to be used in ambulances and low resource settings. The device is able to monitor the brain activity of the newborns enabling the doctor to diagnose and monitor the condition of the baby

Commercialization Strategy

We plan to take the product to market ourselves. We are plan to reaching out to key opinion leaders through our clinical investigations. Clinical data from the tests from these hospitals will help us reach out to more hospitals and help in adoption. For our first year, we intend to focus on 4 states in the South India where we will push our product aggressively. We have already established linkages with these hospitals and created buzz about the product. Given the critical need that exists in hospitals, we hope to be able to get them to adopt the device faster. We will tie-up with few distributors in the neonatal domain to help us extend our reach. After the first year, we



will plan to reach out to the West, North and East India. In the future, reaching out to countries in the South Asia region is very much on our agenda

Products in the Pipeline

We are focused on neonatal critical care domain and hence our devices will be focused on addressing challenging neonatal conditions. At the moment we are focused on this treatment device for hypoxic ischemic encephalopathy

Mentors

C-CAMP and Venture Center

Critical Areas for Mentorship

Clinical trial planning and execution, business planning and investor preparation

Funding Mobilized

Funding from DBT – BIRAC (BIG and IIPME)

Achievements

- Selected for BIG funding has been a huge validation of our work
- Won the Westley grant challenge in US
- Selected for follow-on funding as part of IIPME from BIRAC and Department of Electronics

Entrepreneurial Journey - Nutshell

It has been exhilarating to understand the types of healthcare challenges and its sheer magnitude in India. From an idea, taking stakeholders together towards a realistic solution has been a tremendous experience. What keeps us going are the many noble souls who passionately support and encourage us all along. What keeps us awake are the young ones wanting a chance to live and thrive in this world and their parents who would give up everything for their bundle of joy!

Lessons from the Journey

Understanding the problems of the end-users is the only way to build a good solution for it. To understand the problem, one needs to spend time with the stakeholders i.e. doctors, nurses and patients at the various clinical settings

Road Ahead

We want to establish ourselves as neonatal focused medical device company bringing to market globally admired products to address some of the intractable challenges in newborn care

Advice for Budding Entrepreneurs

Perseverance is the key.



Viravecs Labs LLP

Founders: Rohan H. Kamat and Srikanth Budnar

Year of Establishment: 2014

Location: C-CAMP, Bengaluru, Karnataka

Annual Turnover: Pre-revenue Stage

Team Members: 4

Area: Customized Molecular Biology Products



Academic Background

Rohan and Srikant are M.Sc in biotechnology and Ph.D in molecular virology from Mumbai University

Motivation to Pursue Entrepreneurship

We have always been interested in translation research, and that was one of the major reasons to pursue our own journey in this sector. With our combined skill-set and complementary thought process, this was the ideal step to take on completion of our Ph.Ds and post-doctoral stints. Viravecs Labs thrives on the motivation of giving some of our science back to the society in terms of future medicine

Identification of Business Opportunity

Transgenics is a field that not only requires book knowledge but also considerable hands-on experience. Between the founders, there exists almost 20 years of such experience partnered with the fact that there are no exclusive companies focusing on transgenic biology was a major business opportunity

Products in the Pipeline

Viravecs is India's earliest companies harnessing the power of CRISPR Cas9 based genome editing. We also have an expertise in viral vectors and allied techniques for generating transgenic model systems in life science. We are now collaborating with other companies to use non-viral nanoparticles for enhanced and safe gene delivery and also working on single cell genome editing. Our portfolio is-

- Novel technique to make stable, transgenic cell lines with no off-target effects
- Novel nanoparticle based in vivo genome editing platform
- Single cell genome editing using microfluidics
- Mouse model for corrective gene therapy using novel nanoparticles

Commercialisation Strategy

We have two verticals for commercialisation-

- Services provided to the biotechnology industry
- Out-licensing technologies mainly therapeutic technologies towards rare genetic disorders to larger pharma companies or gene therapy companies. We are selling corrective gene therapy cell line models to establish proof-of-concept for rare diseases

Mentors

Dr. Robin Mukhopadhyaya, Dr. Ajith Kamath and Dr. Ayyappan Nair



Critical Areas for Mentorship

Business aspect, especially if the entrepreneurs are from science background: the economics of running a business and the sustenance models for long term survival are the main points where many startups falter

Funding Mobilized

Rs. 70 lakhs from DBT - BIRAC, Rs. 7 lakhs from MSME and Rs. 40 lakhs from KBITS

Achievements

- Covered as India's hottest startups in Biospectrum India
- Featured in Economic times as one of India's earliest companies working on genome editing, 2016
- Awarded "BIRAC Innovators award in healthcare", 2017

Entrepreneurial Journey - Nutshell

We started in 2014 when we were awarded the competitive BIG scheme by DBT-BIRAC. We successfully utilized that funding and managed to get follow-on funding to make our idea market ready. In parallel, we started multiple collaborations with like-minded companies and people which helped us broaden our horizons and open up new sectors. We have now entered the healthcare sector into the rare genetic disease therapeutics and also are using microfluidics to edit the genomes in single cells

Lessons from the Journey

It is just the beginning of the journey for us so there is a lot to learn and adopt. We have learnt the most important thing in this journey is the 'network'. We keep on exchanging notes with people of all sorts, from junior research fellows on the campus to the senior founders of established companies. Secondly, entrepreneurial journey is a crash course in money and people management, particularly since we are never taught that in science. Suddenly the cost of every raw material/consumable is visible and we start valuing it more. Optimum output from your colleagues is desired, all the while making sure that they are happy working with the startup



Road Ahead

In the next five years, we hope to raise funds from angel investors and venture capital investors. This will help us move out of the incubator to have our own laboratory setup. We also hope to patent multiple ideas in pipeline and reap the benefits by licensing them out

Advice for Budding Entrepreneurs

It is important to have 'backup funds', especially for a venture in life sciences which is capital intensive. Any stop gap in funding hampers the functioning of the company. With no backup funds, it is very difficult to do business development, collaborations, etc. As a startup, there is an intense need for the entrepreneurs to invest capital for day-to-day functioning of the company. If backup funds are difficult to gather, give the startup idea a second thought! Secondly, stick to your own core ideas and thoughts if you believe in them. Along the journey you will meet thousands of people who give truck-loads of suggestions, no suggestion is bad; but see if it fits in your goals and only then pursue them.



Windmill Health Technologies Pvt. Ltd.

Founders: Avijit Bansal and Ayesha Chaudhary

Year of Establishment: 2012

Location: New Delhi

Annual Turnover: Pre-revenue Stage

Team Members: 10

Area: Medical Devices



Academic Background

Avijit is MBBS from University College of Medical Sciences and GTB Hospital, Delhi University, Diploma in tuberculosis and chest diseases from VP Chest Institute, Delhi University and Stanford India Biodesign Fellow and Ayesha Chaudhary is Ph.D in biomedical engineering from IIT Bombay and Stanford India Biodesign Fellow

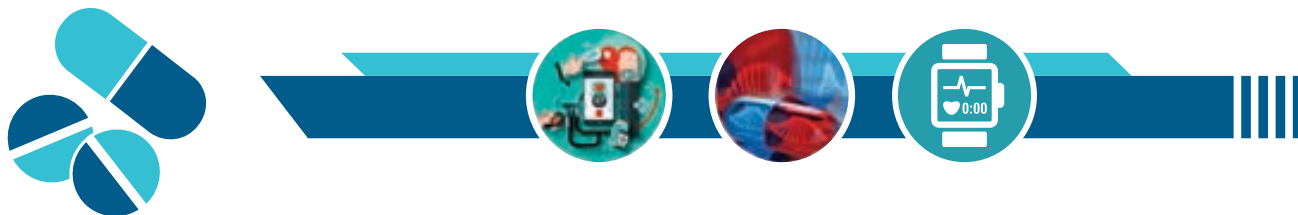
Motivation to Pursue Entrepreneurship

To impact lives through technology innovation was a childhood dream – simply because among all forms of impact, that created through technology innovation scales easily and massively, if the innovation meets a real need. Once a new device is made, it continues to serve for decades – as opposed to process innovations which often need continued interventions to impact. Moreover, we saw that Indians are in the driver's seat at leading technology companies and hospitals across the globe, yet India imports over 85% of its medical devices. Also with an underserved population running into hundreds of millions, a cohort of young, talented and driven young people and the financial muscle of a vast and growing economy, India if unleashed, would be ideally placed for innovation in global health. The company if successful would also show to young Indians that they can achieve financial, creative and spiritual satisfaction while serving the needy if they took the path of med-tech entrepreneurship. This paradox of scarcity amongst capability and opportunity struck us deeply and we wanted to show to the world that world class medical innovation can come from India, not only by Non-Resident-Indians. With these thoughts, Windmill Health was founded with the mission of bringing 3-5 globally impactful products in the first 10 years. Since we seek to serve the underserved, generous grant funding from leading donors, like BIRAC, Gates foundation, USISTEF, Grand Challenges Canada and Villgro were instrumental in getting us off the ground



Identification of Business Opportunity

Avijit, a physician, and a son of two doctors saw first-hand as a teenager - the miraculous power of resuscitation to literally revive people after "near death". Thereafter while training as a respiratory physician, he saw the myriad challenges that make this life-saving procedure of resuscitation difficult to perform – leading to lacks of preventable newborn deaths annually. A formidable body of international evidence highlighted this skill barrier and held it responsible for newborn deaths from birth asphyxia. Several granting bodies listed life-saving tools for frontline workers in their strategic focus documents. With 136 million births every year, and a resuscitation



device being required to stand by for each one of them, the market potential was undoubtable. With this basic understanding, we started pursuing the need for a device to empower frontline health workers to resuscitate newborns effectively

Portfolio

NeoBreathe is the world's first foot operated resuscitation system. It makes it easier to perform the life-saving procedure of newborn resuscitation – thereby empowering caregivers in diverse settings to save lives effectively. Being foot operated, NeoBreathe frees one hand of the operator from the task of bagging. This freed hand can now be used variously. For instance, it can be used -to hold the mask on the face to form an effective seal and reduce leakage by up-to 50%. More effective artificial breath delivery would directly translate to lives saved – when a newborn is struggling to breathe its first. In addition, the operator can use this hand to deliver cardiac compressions – thus making NeoBreathe the only manual resuscitator, which can be used by a single operator to give complete CPR

Commercialization Strategy

NeoBreathe was commercialized on 3rd December 2016 at a launch event presided over by Prof. Vijayraghavan, Secretary, DBT. The product is now available in the market. NeoBreathe is deployed in sites across 15 states of India and a few units in Africa and Argentina. Windmill Health is partnering with Phoenix Medical Systems to commercialize NeoBreathe around the world

Products in the Pipeline

RespiTrain: A portable training system to digitally enhance the training process for resuscitation. Users can measure their performance in real time and sharpen their skill rapidly. This also helps reduce the number of experienced trainers required for resuscitation training. It simulates a pressing scenario and measures the performance on a variety of parameters. In the end it compiles a performance report which can be used for certification and training quality assurance

Mentors

Dr. Balram Bhargava, Dr. Vinod Paul, Dr. Ramesh Agarwal and Dr. Rakesh Lodha from AIIMS, New Delhi. Dr. Raj Doshi, Dr. Anurag Mairal, Dr. Vinod Bhutani from Stanford University, Mr. Aditya Ajmera CHIMCO Biomed, Mr. Dinesh Kumar, Designinnova, Mr. Robert Fan, Flatiron consulting, Colorado and Mr. Ravi Kaushik, Medtronics

Critical Areas for Mentorship

Technical, clinical and business aspects

Funding Mobilized

Total funds raised: \$US 700,000 from DBT- BIRAC (BIG), GCE grant by Bill and Melinda Gates Foundation through India Knowledge Park, US India Science and Technology Endowment Fund and Villgro Innovations Foundation

Achievements

With a product that has begun to save lives, we have our sights set on scaling it up to thousands of sites, as well as continue to build new and meaningful products. NeoBreathe was awarded the 'BIRAC National award for Commercialization of Indigenous Technology' by the President of India on National Technology Day 2017

Entrepreneurial Journey - Nutshell

The product has helped hundreds of babies breathe their first breath. Studies have consistently shown a 20%



improvement in performance and a definite increase in perceived ease of use. Over and above this, we have helped several young people successfully explore the entrepreneurial path. Three of Windmill alumni are now in leading universities in US and Denmark. Three have started their own companies while many others are working with renowned companies, making their contribution to public health

Lessons from the Journey

It is all about the people. A committed cohesive team is the most valuable resource a start-up can have. If the team members are all passionate, no difficulty is insurmountable. People are willing to help, all one needs to do is ask and recognize the help. First focus on Minimum Viable Product (clinically usable) and then add features and aesthetic items



Road Ahead

In next 5 years, we aim to become a powerhouse of meaningful health innovation – with 3-5 winning products creating impact globally and 2-3 in the pipeline. We seek to find committed and like-minded partners who can help us reach the last mile to create on-ground impact

Advice for Budding Entrepreneurs

- As a first project, choose an innovation that has a high demand, low risk and short time to revenue. Bringing the first product to market will give immense confidence and experience to undertake more sophisticated products later
- Limit the time of R&D and market research, and adding features. Build a solid reliable Minimum Viable Product first, (with only essential features) launch it in the market get early traction, make some revenue and only then start adding features and versions
- Become an entrepreneur only if you are insanely passionate about a cause. This is a hard road to tread and doesn't make any sense otherwise.



Yaathum Biotech Pvt. Ltd.

Founders: Anitha Rajagopal and Arivan T

Year of Establishment: 2012

Location: IIT Madras Bioincubator, IIT Madras Research Park
Chennai, Tamil Nadu

Annual Turnover: Pre-revenue Stage

Team Members: 4

Area: Molecular Diagnostics



Academic Background

Anitha is M.Sc in biomedicine from NHS, UK and Arivan.T is B.Sc (Honours) in computer animation from UK

Motivation to Pursue Entrepreneurship

Yaathum was started with an aim of indigenously developing affordable diagnostic kits for rapid and near patient testing of emerging infectious diseases like drug resistant tuberculosis, Ebola, swine flu, dengue, leptospirosis, malaria, HIV as well as screening /diagnostic/prognostic testing of chronic diseases like cancer, diabetes, thalassemia based on real-time quantitative PCR (qPCR) and other advanced biomedical technologies

Identification of Business Opportunity

As per a recent market study, Indian diagnostic market comprises primarily of reagents and kits, which are to a large extent import driven. There is an increasing need for developing indigenous affordable products rather than importing expensive kits from abroad which are expensive. Also rapid and multiple disease test kits are needed instead of separate single tests. TB is a major global health challenge with 10.4 million new cases and 580,000 drug resistant new cases annually with an extremely low detection rate of which India accounts for 25% of burden. Global drug resistant market estimated to be worth \$US 2 billion

Products in the Pipeline

Novel multiplex qPCR diagnostic kits for multi-drug resistant (MDR) and extensive-drug resistant TB (XDR-TB) in a single test which is done in less than 2 hours in one third of the present cost. We are also working on a sample prep system to make the tests to be even more accessible in designated microscopy centres.

Commercialisation Strategy

India accounts for 25% of global TB burden. Yaathum has a MoU with National Institute for Research in TB (NIRT), Chennai (WHO affiliated centre) which will help us with final validation and roll out the product through national public health schemes like RNTCP, DOTS, STOP-TB (Ministry of Health & Family Welfare) and also obtain WHO endorsement. There are also sizable private testing labs that can be targeted through initiatives like IPAQT and our business networks. We are now validating the XDR-TB and MDR-TB kit we have developed in large scale national level multi centric trials in collaboration with Indian Council for Medical Research to take it to the market

Mentors

Dr. Soumya Swaminathan, Director General ICMR; Dr. Uma Devi, National Institute for Research in TB (NIRT) and Dr. Guhan Jayraman –Director, IITMadras Bioincubator



Critical Areas for Mentorship

Commercialisation, technology licensing options, raising funds and technology based mentorship

Funding Mobilized

Rs. 36.5 lakhs from DBT-BIRAC (BIG) and Rs. 55 lakhs from personal savings

Achievements

- Selected for a highly competitive grant from USAID
- First multiplex real-time PCR based diagnostic developers in the country, 2012
- Selected by Swedish Government out of 1300 applicants for Young Connectors of the Future Leadership Program from India in Social Entrepreneurship Category, 2015
- Semi-finalists of 43 North Global Entrepreneurship Challenge, USA out of 11,000 companies globally
- Featured in Biospectrum Asia for Emerging Biopreneurs in India

Entrepreneurial Journey - Nutshell

Being first generation and young entrepreneurs especially in the field of biotechnology in India along with sustaining for 4 years is itself an achievement

Lessons from the Journey

Biotech startups require heavy investment and long gestation period i.e an average of 7 years. Our initial challenges: There was no incubator space with lab facilities and infrastructure in Tamil Nadu at the time we founded the company. So, major portion of our investment went into infrastructure building which could have otherwise been invested into product development. When IITM Bio-incubator came up, we got space with facilities. We got our initial seed fund or grant only 2 years after starting up which was another major challenge but since we had some personal money invested we could manage the venture. Also our passion and drive for our idea of rapid affordable diagnosis in low resource settings was immense to keep us going



Road Ahead

Commercialisation of our DR-TB diagnostic kit is our goal. Apart from drug resistant TB, we will develop kits for other infectious diseases like hospital acquired infections, ebola, swine flu, dengue, leptospirosis, malaria, HIV and screening /diagnostic/ prognostic testing of chronic diseases like cancer, diabetes, thalassemia based on real-time quantitative PCR (qPCR). We also plan to expand our profile into the area of Genomics and preventive/ personalized healthcare services

Advice for Budding Entrepreneurs

- Passion for the idea and diligence to see it through to the end
- Innovativeness and impact of the idea
- Team and collaborator network; incubation at the right place with facilities and mentor networks
- At each stage seeking for the right type of funding or investment
- Avoid any investment on infrastructure building.



BIO INDUSTRY



Binventor Labs Pvt. Ltd.

Founders: Tejas S Kusurkar and Brindan Tulachan

Year of Establishment: 2015

Location: SIDBI Innovation and Incubation Center, IIT Kanpur, Uttar Pradesh

Annual Turnover: Pre-revenue Stage

Team Members: 2

Area: Personal Care Products



Academic Background

Tejas and Brindan are Ph.D from IIT Kanpur

Motivation to Pursue Entrepreneurship

After finishing Ph.D, we saw an opportunity in silk industry which has been overlooked since decades. Since India is the second largest manufacturer of silk in the world, we need to be resourceful. Keeping this in view, we decided to work in this area which could benefit multiple industries



Identification of Business Opportunity

Business opportunity was identified through fieldwork and market analysis

Products in the Pipeline

We have developed a 'UV light protective fabric conditioner'. This bio-inspired product can reduce penetration of UV light from the fabric hence protecting our skin and reduce the de-pigmentation of clothing due to exposure to sunlight. Fabric conditioner is almost a hundred year old market. It has reached a saturation level due to its invisible product improvements. In 21st century we have problems like global warming and increasing UV index. To tackle contemporary issues we need to re-modulate our products. Enabling UV protection in fabric care is one of such modification. The technology behind this product is inspired from nature and UV protective ingredient is extracted from silk waste making this a sustainable and eco-friendly product

Mentor

Prof. Amitabha Bandyopadhyay, IIT Kanpur

Critical Areas for Mentorship

Industry partnership and collaboration

Funding Mobilized

Self-funded

Achievements

Filed applications for patent and trademark



Entrepreneurial Journey - Nutshell

We have established connections with a few multi-national companies related to personal care products. Our samples are being tested in their own labs in India and abroad. Currently we are working on our next entrepreneurial venture

Lessons from the Journey

Contacts are very essential for a growing start-up. Socializing in events, meetings and conferences can help more than you expect

Road Ahead

We intend to generate perpetual revenue/royalty working in collaboration with other FMCG companies

Advice for Budding Entrepreneurs

- Do thorough analysis of economics/financials of the business
- Keep increasing your intellectual property portfolio



Butacel Bioresearch Pvt. Ltd.

Founder: Nidhi Adlakha and Neha Munjal

Year of Establishment: 2014

Location: New Delhi

Annual Turnover: Pre-revenue Stage

Team Members: 3

Area: Bioenergy



Academic Background

Nidhi and Neha are Ph.D in life-sciences

Motivation to Pursue Entrepreneurship

Our motivation to establish a startup has been that we had an idea which could be pursued an entrepreneurial venture. Moreover, there is a lot of impetus by the Government of India

Identification of Business Opportunity

While pursuing our Ph.D, we came across interesting molecule which was not produced in India. So, we aimed at its biological production as a business opportunity



Products in the Pipeline

Further improving the production of dutanediol from caenibacillum strains which have been genetically modified so that the deduced polymer can be used in the rubber industry as well as pharmaceuticals

Mentor

Dr. Syed Shams Yazdani

Critical Areas for Mentorship

Intellectual property rights

Funding Mobilized

Rs. 50 lakhs from DBT - BIRAC

Achievements

- Filed one Indian patent from our technology

Entrepreneurial Journey – Nutshell

We started our venture with product development in our mind. Though, we could scale up our technology to a significant level but we had to face many technical hurdles. We learnt a lot from our mentors from C-Camp and BIRAC who helped us in making our journey easy and targets achievable!



Lessons from the Journey

Initial challenge was to find right buyers for our technology and still struggling for same!

Road Ahead

To develop the product efficiently and collaborate with a big brand so as to be able to commercialize the products

Advice for Budding Entrepreneurs

Any idea should be first judged well by mentors in terms of its feasibility, requirement and applicability and then only implementation should be carried out.v



Carot Labs Pvt. Ltd.

Founder: Naveen Chandramohan

Year of Establishment: 2015

Location: Chennai, Tamil Nadu

Annual Turnover: Pre-revenue Stage

Team Members: 12

Area: Algal Biotechnology



Academic Background of Founder

Naveen received his M.S in Computational Biology from Carnegie Mellon University, Pittsburgh, USA

Motivation to Pursue Entrepreneurship

My motivation has been my innate passion to build a product company from scratch and scale heights. Entrepreneurship renders the freedom and ability to go after the ideas, strategies and vision that we believe in

Identification of Business Opportunity

Business opportunity was identified through intuition, analysis and general awareness

Portfolio

Human and animal nutrition - Probiotics /Nutraceuticals; Marquee Product- Algal Astaxanthin

Commercialization Strategy

We are in the process of setting up a production facility for our initial nutrition product line-up.

Products in the Pipeline

Technology development for biologics

Mentors

As is the case for many individuals, my father Mr. S. Chandramohan is my primary mentor and lifecoach. In addition, I draw inspiration from the lives of several great personalities from across different walks of life, including Lee Kuan Yew, Rajinikanth, Elon Musk, Jeff Bezos, Narendra Modi, among others

Critical Areas for Mentorship

With the surge of incubators for startups across India, there is no dearth of mentorship/advice for young startups and entrepreneurs. This in itself, in my view, poses a unique problem- the need to filter and differentiate





the relevant advice from the rest. Having said that, some areas of mentorship that may help in early stage entrepreneurial success are- staying lean, planning/balancing the short/mid-term goals, ensuring sustainability, and long term goals, and mentorship on doing the right recruitment as a startup grows in team size

Funding Mobilized

Bootstrapped

Achievements

- Received DSIR recognition for R&D facility
- Successful development of proprietary bioprocess, in-situ extraction, photo bioreactor production technologies
- Successful development of novel formulation for various functional nutrition and cosmetic applications

Lessons from the Journey

As clichéd as it may sound, a startup journey has its fair share of both highs and lows. Sometimes, the lows are prolonged. But hang in. Reassess. Optimize. Bite the low until the next high

Road Ahead

Carot Labs is striving towards excelling as a technology company with an enviable product portfolio consisting of natural nutrition and cosmetic products

Advice for Budding Entrepreneurs

Think Big. Take small steps.



Cellzyme Biotech Pvt. Ltd.

Founders: Rajkumar Rajagopal, Vasu Vinayagam and Naveen Kumar

Year of Establishment: 2013

Location: Coimbatore

Annual Turnover: Pre-revenue Stage

Team Members: 6

Area: Speciality Enzymes



Academic Background

Rajkumar is B.E in chemical engineering from Annamalai University, M.Tech in biotechnology from Anna University and Ph.D from Potsdam University, Germany and Vasu and M.Tech and Ph.D in biotechnology from Anna University

Motivation to Pursue Entrepreneurship

Our motivation to become an entrepreneur was based on the opportunity in offering specialty enzymes. Biotransformation using immobilized enzymes would reduce the environmental foot print by replacing harsh industrial chemicals and processes with our green technology



Identification of Business Opportunity

We shortlisted the business opportunity by identifying the pain points of end users

Portfolio

Immobilized Enzymes –

Rhamnogalacturonan acetyltransferase (RGAE)

Cis-epoxy succinate hydrolase (CESH)

Esterases

Cytochrome P450

Phytase

Dehalogenase

Dehydrogenases

Protein Hydrolysate

Commercialization Strategy

Currently, product has been validated by third party who is a US FDA regulated pharmaceutical industry in India. In next phase the product will be manufactured and sales and distribution channels will be established

Products in the Pipeline

Protein hydrolysates, Protein isolates, enzymes, immobilized enzymes for green manufacturing of pharmaceutical drugs



Critical Areas for Mentorship

Validation, fund raising, marketing and imparting negotiation skills

Funding Mobilized

Funding from DBT – BIRAC (BIG); DBT – BIRAC (SPARS) and Pfizer-IIT Delhi

Achievements

Won several awards & accolades listed below -

- Jury appreciation – IIGP 2.0, 2017
- United Nations Global Cleantech Innovation Program (UN GCIP) – Runner- up, 2016
- Pfizer IIT-Delhi IP and Innovation Award, 2016
- Won Start up Elevator Pitch: Massachusetts Institute of Technology, 2016
- Bio Excellence Award 2016 - Emerging Bio Industrial Company, Govt. of Karnataka, 2016
- FICCI R&D Catapult Award (Startup category), 2015
- BIRAC-IGNITE Fellow, Judge Business School, University of Cambridge, UK, 2015
- Gold Award, India Innovation Growth Program (IIGP) by Stanford-DST-Lockheed Martin, 2015



Entrepreneurial Journey - Nutshell

Having returned to India after spending almost a decade in Switzerland and Germany in premier research institutes and industries, Rajkumar embarked on this exciting journey. He started based on opportunities and gaps identified in industrial biotech sector and pivoted based on the market needs. Proof of concept had been realized for the Green Manufacturing of Pharmaceutical Intermediates using Smart Enzymes. Currently, we are in talks with a pharmaceutical company for licensing of our product

Lessons from the Journey

Identifying the problem, networking and mobilizing funds were grand challenges to get the fledgling startup off the ground

Road Ahead

We would like to set up a manufacturing plant and establishing our own sales and distribution channels to reach out the prospective clients

Advice for Budding Entrepreneurs

- Being passionate is actually infective and it can cloud everything
- Establish and nurture your networking skills
- Identify specifically the pain your technology addresses/problem it solves: a monetizable “shark bite” validated by your due diligence.



Cleanergis Biosciences Pvt. Ltd.

Founders: Prashant Naik and Sangeeta Naik

Year of Establishment: 2013

Location: C-CAMP, Bengaluru, Karnataka

Annual Turnover: Pre-revenue Stage

Team Members: 3

Area: Food, feed and fuel



Academic Background

Sangeeta Naik is Ph.D from Indian Institute of Science and Prashant Naik is Ph.D from University of Pune

Motivation to Pursue Entrepreneurship

Our motivation has been the desire to deal with challenges every day, use our learning and experience for our own benefit and desire to be our own boss

Identification of Business Opportunity

We identified our business opportunity by talking to people about their need and their problems working in this area



Products in the Pipeline

Industrial enzymes, food ingredients, feed additives. Technology is in pilot plant testing stage

Commercialization Strategy

At the moment we are concentrating more on the development of technology for treatment of industrial waste water treatment

Critical Areas for Mentorship

Identification of a real problem and its solution, building trust, finding co-founders, team-building and fund raising

Funding Mobilized

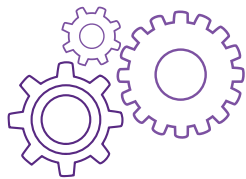
Self-funded– Rs. 14 lakhs

Achievements

Project selected as one of the top 50 innovations in India Innovation Growth Programme 2015 and Biotechnology Ignition Grant 2016

Entrepreneurial Journey - Nutshell

Few collaborations have been established which have been successful so far. We have received recognition from India Innovation Growth Programme. Also, we have obtained funding from Biotechnology Ignition Grant, Government of India for one project



Lessons from the Journey

With absence of funds and infrastructural facility for product development work, it is important to develop patience and remain optimistic

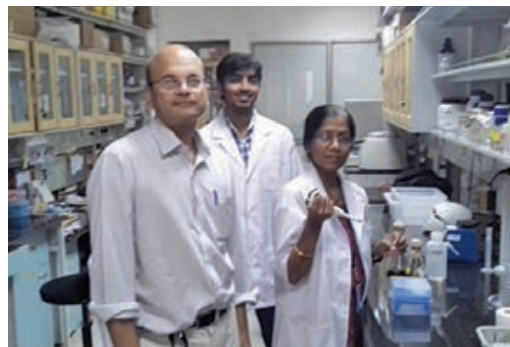
Road Ahead

We aim to have 1-2 products in the market and consolidate a revenue positive position in the coming years

Advice for Budding Entrepreneurs

One needs to analyse own strengths and weaknesses. The path of entrepreneurship is not an easy one. It requires a lot of strength, patience and commitment. You are on your way, but there is no path. Which is the direction in which you should take your step? There is no-one to tell you that. It is all decision making by yourself or your little team if there is one. You have to find money to fund your activity. This is a constant challenge. There is

no clear end in sight, everything is hazy. Above all you need to have constant hope, be positive all the time, control your fears, work hard without expecting quick monetary or other rewards.





Codon Biosciences Pvt. Ltd.

Founder: Archana Thakur

Year of Establishment: 2011

Location: Taleigao, Goa

Annual Turnover: Pre-revenue Stage

Team Members: 6

Area: Fermentation Technology



Academic Background

Archana is M.Sc in Microbiology from Goa University and Ph.D in Biotechnology from Mumbai University

Motivation to Pursue Entrepreneurship

My motivation has been to build an enterprise with own ideas and work experience

Identification of Business Opportunity

Initially the company started working like a small-scale contract research organization providing DNA and protein based services



Product in Pipeline

The company is involved in R&D, manufacturing and marketing of fruit wines starting with Mango wine under the brand name 'Pomar-de-Frutas'. This mango wine goes very well with all types of barbecues and Asian cuisine. The wine can also be enjoyed as an aperitif. R&D work is in progress for pineapple wine and pomegranate wine



Commercialization Strategy

Our product 'Mango Wine' under the brand 'Pomar-de-Frutas' is already in Goa market. We are presently involved in manufacturing, branding and marketing of the product. The product 'Mango Wine' is launched in market during 'Grape Escapade' April 2017 in Goa. Our product was launched in market in April 2017. We will start generating revenue from this financial year 2017-18

Critical Areas for Mentorship

Entrepreneurs must be aware of funding agencies, bank loans and other schemes, which are very important for their business to survive and grow. Entrepreneurs must know how to create a brand value of their product as they enter the market. Branding is very crucial if they are looking for a long term reliable market.

Funding Mobilized

Rs 1 crore funding from promoters and DBT – BIRAC (BIG and SIBRI)



Achievements

- Codon Biosciences has a well-established R&D laboratory, recognised by DSIR
- Company was also awarded with BIG and SBIRI grants. The mango wine was developed through the BIG project

Entrepreneurial Journey - Nutshell

The journey so far has been tough and eventful. Despite the difficulties, the technologies developed so far have been patented and being commercialized. The company has now set up a pilot 'Fruit wine' manufacturing plant in Goa. The product Mango Wine was launched in April'2017. The wine is sold under the brand name "Pomar De Frutas", which means 'Fruit orchard' in Portuguese

Lessons from the Journey

As a start-up SME, we did face our share of hardships due to insufficient working capital. The R&D was supported by DBT-BIRAC through BIG and we could develop our own product in the form of 'Mango Wine'. Setting up a small scale manufacturing unit was a major challenge. Thanks to Bank of India and our company shareholders for financing the on-going activities

Road Ahead

A series of other fruit wines such as that of pineapple and kokum would be added to the product line. The company has extended its R&D to valorisation of fruit wastes, in collaboration with German and French institutes

Advice for Budding Entrepreneurs

An entrepreneur needs to be focused and consistent all the way. Plans do fail sometimes, but be ready to change according to market needs. Do believe in your products and brand them properly.





MicroGO LLP

Founder: Rachna Dave

Year of Establishment: 2016

Location: Golden Jubilee Biotech Park for Women, Chennai, TamilNadu

Annual Turnover: Pre-revenue Stage

Number of Team Members: 6

Area: Infection Control Devices



Academic Background

Rachna is Ph.D in microbiology from Sardar Patel University, DST Fast-Young Scientist, 2008-2010 and worked at Bhabha Atomic Research Centre till 2016

Motivation to Pursue Entrepreneurship

I have been motivated by the thought that I should be able to work on any problem under the sun. I also wanted to take up a more challenging role for myself. The atmosphere in the country was so favourable so I thought this would be the ideal time to take the plunge



Identification of Business Opportunity

We realized most of the technologies practiced in India are developed by the western world. India needs its own, tailor made technological solutions keeping our country's multi-level diversity into account. We may not be able to offer the precise solution immediately but, if we start working from now, pave the right path, few years down the line we will reach there

Portfolio

We aim to provide technological solutions in all the frontiers like air, water, surface, food and vector for advanced health and hygiene. Our products are -

- Tubelet™ - Every year, about 30-45 % of the produce is rendered unfit for consumption due to microbial spoilage after harvesting. Our Tubelet™ is aimed to reduce the microbial spoilage and thereby extending the shelf life of the produce. We have been successful with potatoes, onions and tomatoes for as long as 45- 60days at ambient storage conditions. As per the market data for every one percent reduction in loss of produce, will save 5 million tons of fruit and vegetable per year. Our growing population demands that we can save not only to grow more, but also to save what is grown. We are at present conducting clinical trials and have reached prototype stage with user feedback
- 'Push n Disinfect' for involuntary hand hygiene for common touch points (hot spots for infection transfer). It helps you in breaking the chain of bug spread compliments and advances the hand hygiene programme at your establishment. Its unique design releases the disinfectant when pushed while opening the door.

Commercialization Strategy

Both our products are at user trials stage; we expect to be able to commercialize them by the end of 2017



Products in the Pipeline

Powerless, on-the-Go, device for sterilization of surgical instruments for resource limited settings

Mentors

Mithun Sacheti, Founder and CEO, Caratlane; Dr. Sudha Nair, CEO, Golden Jubilee Biotech Park, Chennai; Dr. Soma GuhaThakurtha, Professor, IIT Madras and Dr. Ashwin Agarwal, Executive Director, Chief of Clinical Services, Dr. Agarwal's Eye Hospital

Critical Areas for Mentorship

Networking, product development, commercialization, value proposition, revenue generation and profitability

Funding Mobilized

Rs. 50 lakhs from DBT – BIRAC (BIG) and Rs. 75 lakhs from angel investment

Achievements

- Filed three patents (2 Indian and 1 PCT) and they form the foundation of our current product line
- Built a strong foundation in both surface and water domain and the feedback we are getting is allowing us innovate further

Entrepreneurial Journey – Nutshell

The past fifteen months since the establishment of MicroGO have been great. I am learning all the time. I always had the inkling towards meeting new people and MicroGO gives me a chance to do that every single day. Quitting an institution like the Bhabha Atomic Research Centre in times when I was doing extremely well (received the Young Applied Technologist Award conferred by the DAE and received outstanding promotions) was very difficult. I had carved a niche for myself, had great colleagues and a very balanced life in Kalpakkam. My child is still young and I knew that the initial years in building the company would affect that balance. Here the school, home and work chosen are within 5 km radius. Plus I have a tiny area at work where he stays with me after school, late nights/weekends. Most importantly, I have a great friend in my husband who supports me thick and thin!

We are located at the first Women Biotech Park in India that gives a very conducive environment for the women entrepreneurs to function. Watching the company build from scratch has been extremely exhilarating. I was also fortunate enough to have a business partner who is very supportive. Building a team that treats the startup with same enthusiasm as you is so very important and I am so happy that we have the right team who share the same emotion and vigor towards MicroGO. Some of the members in the team re-started their career with us and in the manner they are helping us build the company is commendable

Lessons from the Journey

Coming from an academic background, I have learnt that the problems we perceive and the ways we solve them in academics is completely different when you are taking the solution to the consumer. I have realized that it is important to take your minimum viable product to the end user as soon as possible and then work on building the product. The degree of innovation has to be huge. At MicroGO when an experiment or trial fails (happens quite a lot), we smile and innovate a step further. To turn profitable soon, you will boost your spirit, your team, and investors

Road Ahead

Five years down the line, we would atleast have one product from all the five domains commercialised.

Advice for Budding Entrepreneurs

- Work on your business plan to the core
- Problems are more important than the solutions
- Please talk to the end users during your initial days.



Shirdi Sai Nutraceuticals Pvt. Ltd.

Founder: Sambasivarao Javvadi

Year of Establishment: 2012

Location: Bengaluru, Karnataka

Annual Turnover: Pre-revenue Stage

Team Members: 3

Area: Specialty Enzymes



Academic Background

Sambasivarao is Ph.D in food technology from Institute of Chemical Technology, Mumbai

Motivation to Pursue Entrepreneurship

My motivation to start my venture has been to fulfil an existing need in the market and cater to the opportunity to create solutions to meet existing needs of market. I am excited of being able to do what I want to do and get rich rewards for the same. Also, entrepreneurship provides an opportunity to make a difference to the world



Identification of Business Opportunity

Business opportunity has been identified by understanding the needs of market during my employment and possibility of fulfilling the needs by knowing the expertise available within my professional network

Products in the Pipeline

- Low cost high performance immobilized lipases
- Emulsifiers
- Industrial enzymes
- Development of high performance immobilized lipases for modification of oils & fats and biodiesel production

Commercialization Strategy

We are currently in touch with potential customers to initiate laboratory trials for their products using our “High Performance Immobilized lipases”. We are in touch with market players and are fine tuning our solutions to make them commercially attractive. Once we reach this stage, we plan to set up manufacturing facility and start producing and selling to customers

Critical Areas for Mentorship

- Bringing a “customer/market centered, commercially competitive approach” to product/solution development activity (activity should start from the market and then to laboratory)
- Helping them to design projects that are attractive to investors and
- Finding investors



- Valuation of company
- Equity structuring and managing venture / angel investor funds
- Rest of the skills such as finance, marketing, etc. can be hired from the market

Funding Mobilized

Rs. 45 lakhs from promoters fund, Rs. 50 lakhs from DBT – BIRAC (BIG) and Rs. 1.8 crores from DBT – BIRAC (BIPP) (to be received)

Achievements

We have created technologies in the company which will be able to bring commercial viability to manufacturing unit

Entrepreneurial Journey - Nutshell

We have developed excellent High Performance Immobilized Lipases with very high stability. We have also developed economically viable process for production of emulsifiers and bio-diesel from fatty acid distillate. We have been selected for BIPP grant by DBT – BIRAC. We have been fortunate to receive excellent support from DBT- BIRAC and C-CAMP

Lessons from the Journey

- Financial – Meet only essential needs through personal funds
- Getting and retaining manpower – Issues: security, salary and leaves
- Access to scientific literature – had very limited access
- Analytical facilities – Lost lot of valuable time trying to find a facility and it does not meet requirements in terms of time, convenience and cost. It is still a problem area and hope to resolve as soon as we get commercialization funding

Road Ahead

In the future, we intend to produce and market High Performance Immobilized Lipases on a global scale, emulsifiers and lipases both in India and abroad. We are also ready to commercialize some specialty fats

Advice for Budding Entrepreneurs

- Absolutely essential to have deep domain expertise to make a difference in both science and market – could be a team of promoters with atleast one of them with experience in relevant market
- Adequate financial backup is essential to have smooth operations – Not to depend solely on grant money during development phase
- Preferably locate yourself in a research institute well equipped with library and analytical facilities relevant to your area of work
- Get a team with outstanding professional skills and who have fire in the belly to make a difference and create a life of their own
- Get a panel of consultants to advice on-
 - Finance – valuation, equity and funding
 - Engineering expertise to figure out production plant and cost of establishing plant as well as product costing
 - IP and regulatory decisions
 - Preferably try to get investments from companies that are already engaged in business of related areas and have been operating in relevant markets. This can make a huge difference to success of venture.



WeInnovate Biosolutions Pvt. Ltd.

Founder: Milind Choudhari

Year of Establishment: 2016

Location: Venture Center, NCL Innovation Park, Pune, Maharashtra

Annual Turnover: Pre-revenue Stage

Number of Team Members: 5

Area: Molecular therapeutics



Academic Background

Milind is Ph.D from Aghakar Research Institute, University of Pune

Motivation to Pursue Entrepreneurship

My motivation to become an entrepreneur has been to work independently and make a difference in the society. I believe that pursuance of the unexpected will be a game changer

Identification Business Opportunity

During working and reading about the problem, I realized I can use certain molecules to accelerate wound healing. I figured out that this area is quite neglected for new innovations and the market volume is huge

Portfolio

- **HEALRAP:** It is our first registered innovative product. Our idea of making this product deals with a novel organic and inorganic nano-formulation for rapid wound healing and antimicrobial activity. HealRap is a product which was prepared with the help of naturally available material (having antimicrobial properties) and nanoparticles (wound healing properties) in a vesicle (formulation) to be used in bandages and sutures for wound care.
- **SILVOCLEAN:** It is a disinfectant spray for hospital surface cleaning.

Commercialization Strategy

We carried out pre-market analysis by studying responses of real customers and then further engaging with the dealers who sell similar products. Silvo clean is available in the market since May 2017 and is quite a success with the customers

Products in the Pipeline

- **HEALRAP ADV:** It is a combination gel which not only provides prevention of infection but also accelerated the rate of wound healing. We hope that in coming years we may be able to provide a complete solution for treating the complexities of the diabetic foot ulcer.
- **HEALRAP:** It is a gel for wound healing
- We are working on medical device on antimicrobial susceptibility for which a grant from DST has been sanctioned



Mentors

Dr. Manisha Deshmukh and Dr. Chandrashekar Mote

Critical Areas for Mentorship

Doctor's outlook for providing any medical treatment

Funding Mobilized

Rs. 36.8 lakhs and Rs. 50 lakhs from DBT – BIRAC; Rs. 50 lakhs from NSTEDB and Rs. 10 lakhs from CIIE, IIM-Ahmedabad

Achievements

- Part of “Cohort” at IIM- Ahmedabad
- Won the Healthcare accelerator competition
- Granted DBT - BIRAC's SBIRI and BIG Grant

Entrepreneurial Journey – Nutshell

The journey so far has been quite interesting and full of excitement. The company has grown to a family of 7 people directly or indirectly involved with the venture. The R&D product has reached to pre-clinical investigative studies. The company is valued at \$US 1 million. With the launch of Silvoclean by this year, we expect the revenues to jump exponentially

Lessons from the Journey

Initially, organizing the setup and joining hands with the right people was the biggest challenge. We strategized our hiring by following the “On same stage” policy, by which we recruited people who have the similar thought-process making things easier. We struggled for investments, fortunately the science behind the technology was strong so the Government agencies gave us grants and that made it easy for the investors to follow

Road Ahead

In next 5 years, the products in pipeline will finish the regulatory pathway and will be in the market. We see the company in full force of its production and aim for sales targeting revenue of \$US 1-2 million per annum. We want to progressively move in the market to capture atleast 10-20% market share. We also aim to start overseas operations in atleast 5 countries. We would also see the WeInnovate Biosolutions family to grow by 10 folds



Advice for Budding Entrepreneurs

- Motivation: is the most important factor for success, one needs to be always ready to face the music. High motivation helps you think by clearing the background noise
- Believe in your idea: If you trust your idea, you can clearly convey it to others. Making others understand your technology is an art and you will be good at it only if you have faith in your idea
- Adaptability: Adapting to the new market demands and changing the strategy accordingly helps you sustain. There is no one rule of making your point. Adapt to the environment and you will get several dimensions to look at a particular problem and solutions to solve it.

NURTURING BIOENTREPRENEURSHIP: WAY FORWARD

Entrepreneurship is critical for achieving sustainable and inclusive growth, and has significant potential for creating further jobs beyond self-employment. To realize the triple dreams of 'Innovate in India', 'Startup India' and 'Make in India' of the Government of India, there is a need to establish thriving innovation ecosystem by prioritizing product innovation and commercialization. Building and nurturing an innovative nation is a demanding and arduous task that needs singular focus, immense dedication and an ability to attract partners with aligned vision. Our country need to harness the entrepreneurial energies present in our academia, industry and start-ups. The solutions to national and global challenges would be developed by entrepreneurs especially start-ups and small & medium enterprises and nimble R&D organizations with deep translational culture.

The Government of India has initiated several policies and programmes, funds and incubators to foster innovation led entrepreneurship. To help new technologies come to market, many universities and institutions have established incubators for entrepreneurs hoping to turn leading edge research into marketable products.

The potential of India to be a global innovation hub especially in biotechnology exists; India is already recognised as a global destination for vaccines, bioservices and contract manufacturing especially biosimilars. Many firms are exploring exciting areas of stem cell biology, synthetic biology, agri-biotechnology, systems biology and exploring evidence based traditional medicine.

The Indian biotechnology industry has also shown that when proper support systems exist they can deliver scaled-up innovative products that are affordable and are of high quality. However, to scale up and increase the frequency of such innovations from India and make it a top destination for biotechnology, implementable strategies need to be formulated to promote innovation, translation, commercialization and entrepreneurship taking into account the views of industry, scientists and other stakeholders. The Indian bio-innovations need to address challenges in healthcare, food and fuel security based on four important paradigms- high quality, sustainability, affordability and accessibility.

An institutional and structural framework has to be built to help India achieve its potential as a breakout nation for biotechnology innovation. Strategies to become a vibrant and innovative bioeconomy should involve encouraging innovative R&D, build infrastructural and human resource capacity for translation and commercialization, facilitate technology access as well as market access for innovative products to achieve scale through public procurement, provide access to risk capital for all stages of biotechnology product's lifecycle, creating a robust regulatory system, conducive tax and fiscal environment and enabling a collaborative environment for fostering academia – industry networks. The stories shared by the bioentrepreneurs in this book provide insights into the issues faced in their entrepreneurial journey.

Sustainable economic growth and development in India is expected to originate from indigenous innovations, technologies, products and services. In such a scenario, there is an immense opportunity for the Indian biotechnology sector to play a positive an important role in the Indian economy as well as contribute to the global economy.

Filled with real learnings from the startups and small enterprises, we hope that this book motivates prospective entrepreneurs and helps them find valuable information for starting and building their own businesses in biotechnology.

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Disclaimer

This book provided by NASI and BCIL is only intended to be a general guide and professional advice should be sought before taking any action on any matter. Eligibility for inclusion in the book has been based on information submitted to NASI and BCIL by the entrepreneurs and there has been no review for safety, efficacy, quality, applicability and cost acceptability of any of the technologies. Therefore, inclusion in the book does not constitute a warranty of the fitness of any technologies for a particular purpose. While due care has been taken to ensure accuracy of the information contained in this book, no warranty express or implied, is being made, or will be made, by NASI and BCIL as regards the accuracy and adequacy of the information contained in this book. No responsibility is being accepted, by NASI and BCIL, for any consequences, including loss of profits that may arise as a result of errors or omissions in this book.



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