BioSpectrum
the business of Bio & Health Sciences

Hot Start-ups: A saga of the world's fastest DNA, RNA stain

23 May 2016 | Features

Hot Start-ups: A saga of the world's fastest DNA, RNA stain

Both Dr Fathima Benazir (38) and Mr Alex Paul (38) were schoolmates and best childhood buddies. She was a postdoctoral research fellow at Indian Institute of Science (IISc), Bangalore, and was keenly looking out for opportunities abroad. She approached Mr Alex Paul and sent him her portfolio.

The Unexpected Spark

Intrigued by her profile and research accomplishments, Mr Paul persuaded her to apply her research to solve problems in different areas of Life Sciences.

"I always wanted to be a passionate scientist rather than an entrepreneur," says Dr Fathima, Co-founder & CEO, Azooka Life Sciences.

After several discussions and advice from her IISc mentors including Prof H S Savithri, Department of Biochemistry; Prof M R N Murthy, Molecular Biophysics Unit; and Dr C V Natraj, Advisor, Society for Innovation and Development (SID) IISc, she teamed up with co-founder Mr Alex and started Azooka Life Sciences in 2015.

The name 'Azooka' is derived from the Spanish word *AzÃºcar*, which means sugar in Brazil.

Significance Of Nucleic Acid Stain

The Bangalore-based start-up is said to be the discoverer of a patent-pending nucleic acid gel stain developed from a plant source used as a food additive.

The fluorescent dye named 'tinto rang' is a nucleic acid dye available for applications in Biological Sciences and Genomics.

Nucleic acid stains are a vital part of DNA-based disease detection compared blood-based disease diagnostics.

These stains are vital chemicals used in identifying diseases in human, animal and crop diseases.

In fact, Nucleic Acid-based Testing (NAT) is a USFDA (United States Food and Drug Administration) approved and globally accepted methodology for non-invasive and rapid disease detection.

NAT is said to be a precise and painless molecular testing technique. It is commonly available in the Americas, Europe, Malaysia and Thailand. "However this is not prevalent in India due to the high-cost of the assays and devices used in nucleic acid testing," Mr Paul comments.

On an average, the NAT can cost anywhere between Rs 5,000 to Rs 15,000, and can go up to Rs 25,000, given that only expensive hospitals in cities provide the facility.

"The conventional methods are inferior compared to NAT. It takes longer time, and the results can be negative because of longer incubation periods. Certainly nucleic acid tests are very specific, faster, accurate and way of the future," Dr Fathima voices.

India's problem is that it has to import nucleic acids stains - mainly from the US or Germany.

As a result, there is a payment of 40 to 50 percent import duty including transportation. Most nucleic acid stains are biohazards, toxic, carcinogenic, and mutagenic, and demands careful handling and disposal post experimentation.

Nucleic acid stains are used on a daily basis in disease detection and DNA forensics, so disposing carcinogenic and hazardous substances is a major challenge.

World's Safest Dye

Right now, there are around 30 nucleic acid stains in the world that bind to DNA and RNA. They are widely used in DNA and RNA extraction, visualization and extensively in DNA Forensics, sequencing and genomic studies.

Azooka claims its fluorescent dye as the world's safest and fastest DNA and RNA stain. It was conceived out of Dr Fathima's PhD research, and was launched in March 2016, after 3 long years of hard work and research.

"Our nucleic acid stain is purely an Indian product, and our customers can save big on import duties. Our stain is the first nucleic acid stain to be reported in India and APAC," adds Mr Paul.

The stain is said to be the safest and fastest DNA stain available in the market. "Our dye is faster than the market leading stains like Ethidium Bromide which takes 10 to 40 minutes to stain. Our dye consumes only 30 seconds," Mr Paul points.

The start-up is planning a worldwide product launch by the end of 2016. "Our commercial wing Bhoot Enterprises will fulfil the product manufacturing, distribution, marketing, and sales in India. There are some regulatory and IP challenges in taking our products to market, but we are working under the guidance of SID..." Mr Paul reveals.

Comparing NAT and ELISA (Enzyme-Linked Immunosorbent Assay), a test that detects and measures antibodies in the blood, the latter's test timeline can vary anywhere between 3 to 6 months.

Azooka would focus on developing fluorescent dyes that can be used in multicolor labeling experiments such as FISH (Fluorescence in situ hybridization), FACS (fluorescence-activated cell sorting), chromosomal imaging, cell imaging, sequencing and other pharmacogenomics studies.

"We are incubated for social impact, and we have a big mission.
Our research is cutting-edge, but we didn't find the right market in India because molecular diagnostics is still nascent in the

country. SID played an important role and recognized our innovation," she adds.

Currently Azooka is seed funded and incubated at SID, IISc. The start-up operates only on research and innovation grants.

"We want to purely be an IP- and R&D-based company by creating IPs and values. It is a big mistake to approach VCs immediately after conceiving your ideas. Once you discuss your ideas with VCs and if they are not convinced, you lose your ideas," he cautions. He emphasizes that once venture capitalists (VC) enter a start-up's picture, the focus of research changes.

Mr Paul conceptualized most of the company's products, including the market research and the direction the start-up would take in the future. Prior to this, he was the director of product management and marketing at Zoho Corporation.

Chasing Challenges

DNA-based diagnoses is not so popular in India unlike it is in the US, Europe or Australia.

"Educating the market about what we do is a challenge. Finding the right talent is another daunting task," Mr Paul shares.

Since India does not have proper molecular diagnostic system in place, many times HIV-infected blood, for example, were given to kids. In such circumstances, Azooka's dye is said to play a crucial role in detecting such diabolical elements in samples.

Funding Dramas

Azooka's initial attempts to win grants proved tougher.

"We were told to sell-off our technology and get settled for life. We were already running out of cash, and had a zero bank balance. But we didn't give up. We wanted to bring and build our innovative technology - the country's first nucleic acid stain -- right here in India," Dr Fathima states.

While seeking funding, the start-up's final proposal was rejected by the committee since they claimed their technology as 'no novelty' status.

"The committee is comprises of teachers and academicians who have very less knowledge about markets and entrepreneurship. Thus winning a grant is a challenge. The right system is not in place, and we had to pay a steep price," Mr Paul stresses.

Azooka's products are targeted at blood banks, disease detection kit manufacturers, DNA-based diagnostic labs, DNA Forensics, academic institutions, universities, research labs, and companies in the pharmacogenomics space, seed companies in crop breeding and crop improvement, and medical device vendors.

"We are also looking forward for Patent Cooperation Treaty (PCT) to protect our molecule for 30 months all across the world in 160 countries," Mr Paul comments.

At IISc, Azooka has over 20 customers already. "We want to first win the home ground before a global launch. We also want to partner with kit vendors and molecular diagnostics device manufacturers," Dr Fathima opines.

The start-up expressed interest in working with Roche Diagnostics, Danaher Corporation, Thermo Fisher Scientific, Qiagen and Bio-Rad among others.

Grants Worth Rs 200 Cr

The Karnataka's Millennium Biotech Policy is seen as a fantastic initiative by the Government. Start-ups believe that if the policy is executed well, it will further elevate Bangalore to a greater position.

"About Rs 200 crore Government grants went unclaimed last year," reveals Mr Paul. "We need a one-window clearance system for start-ups. Currently there are no channels or ways through which entrepreneurs can know about availability of such fundings or accessing them. There is no proper communication between the Government and entrepreneurs to get those funds for research. There are fundings available in India and we want a place to go and look what is available. We want a portal where all the funding information is available. Applying for such funds are complicated. And most of them are archaic and old. Patenting and regulatory clearances seem expensive."

In India, a mid-size DNA lab can cost up to $10 million. "...There is no proper ecosystem in the country in the area of application and the whole conducive ecosystem is missing. So all the great scientists go abroad, and also many companies hesitate to enter India," Mr Paul.

In the West, entrepreneurs are seen to bootstrap and create value through their start-ups, or even just start off with uncertainties and slowly execute their strategy.

"It is all about impacting billions and not putting billions into your bank account," Mr Paul mentions.

Bare Ecosystem

He feels that the country does not even have websites to gain knowledge on trends happening in Biological Sciences.

"The whole ecosystem is bare. We are following trends abroad. Personalization of medicine is creating a major trend globally. Gene banking is coming to India through Apollo Hospitals and Narayana Hrudayalaya where genes are going to be stored. We also do not have enough news and publications to know what is happening in our space and what companies are working on," he expresses.

He says that in vitro diagnostic device (IVD) and in vivo imaging space is very nascent in India.

"I wish a lot of start-ups would venture in to it. We need an ecosystem where reagents are made by ourselves which would bring down costs of research and diagnosis. We need to push the Government to make NAT mandatory. Most Life Sciences companies explore NGS or bigdata and are not product-based by creating IPs. IPs should stay within India rather than other countries trying to take it, like in the case of Turmeric and Neem," Mr Paul suggests.

"Indian patent laws are stringent, and this is what is helping the country not lose its IPs and natural resources to other countries," notes Dr Fathima.

Biggest Lessons

Mr Paul says that an entrepreneur needs tons of patience and perseverance in the journey.

"Unlike IT, there are no alpha or beta versions of products in Life Sciences and medicine. Products need to be specific and stable," he advises.

He advises start-ups to try their hands at funding methods like government grants which is valued at around Rs 800 crore. He also says that for Biotech start-ups, Bangalore is the best place to begin. Ahmedabad and Hyderabad are seen favorable for pharma start-ups.

"A start-up is a small slice of the problem where an entrepreneur tries to solve it. Start-ups never die. They commit suicide. When people in a start-up stop caring about it, it eventually dies," says Mr Paul, quoting his ex-CEO Mr Sridhar Vembu of Zoho Corp.

As for Mr Paul, association with SID and IISc has a left a lasting impact on his career direction. "In a typical IT start-up, the pinnacle of success is seen as landing a job at Silicon Valley at companies like Microsoft, Google or Facebook or a unicorn start-up with billion dollar evaluations; or having millions of dollars in the bank; or even being featured on the cover page of

popular magazines," he says.

He explains, "But my journey led me to meet scientists at IISc, who were solving the world's toughest problems like curing diseases or finding drugs and vaccines in India. A silent fight to make India a better place. They are the really happy people. They are humbled by the problems of the world, and try to help the humanity. Our families had a tough time comprehending what we were doing.

"Being an expert in the IT services management, I even got a permanent residency to Australia. But we wanted to create a huge social impact in our homeland. People today will instantly judge you by looks. There is so much prejudice even before you hit the market. And Dr Fathima is a role model. There are women entrepreneurs struggling to make it in this space. But she made it despite challenges!"

Being a woman, the journey had been quite uniquely challenging for Dr Fathima.

"It takes a lot of courage because it isn't easy for a researcher to make a switch from being a scientist to an entrepreneur. Single-minded focus is also very important. You will encounter failures but every time you have to continue to move on no matter what. It is important to have passionate co-founders; to some extent you have to be selfless. For a Life Sciences start-up, it may at least take 5 years to get the product to the market," she elaborates.

"It has been challenging personally and professionally. Being a woman, the challenges doubled. The first best lesson I have learnt is to believe in myself. Believing in what I did. I believe that attitude will take you from where you are to where you want to go. Don't let your circumstances, family, or society pressurize you to lose that faith in yourself. That's the biggest battle I fought. I isolated myself from shame and insults and believed in what I did.

"Once you lose faith in what you are doing then the purpose is lost. Associate with people who believe in you. For us, this is just the beginning of the journey. We have a lot to learn. It's a team work. My parents too gave me the liberty to do what I wanted to do. Never allow anyone to dictate your dreams," ends Dr Fathima gracefully. She is a mother of 2 kids and enjoys cooking and knitting.

Wisdom Pills For Start-ups:

â–ª Associating with right business partners, marketers
â–ª Expertise in chosen field
â–ª Finding good patent lawyers
â–ª Finding passionate team, right advisors
â–ª Good fund management
â–ª Regulatory awareness

Myths To Debunk:

â–ª Impossible to transition from IT to Life Sciences
â–ª Product development takes 10-20 years