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Hot Start-ups: Pioneers in genome editing

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Genome editing encompasses an array of recently developed technologies with a wide application in the Life Sciences industry, and has the potential to be used as therapeutics in future.

These techniques give researchers tools to precisely alter gene function to study their role, or alternatively create disease models for drug discovery and pharmacological studies.

Dr Rohan Kamat (33) and Dr Srikanth Budnar (36) incorporated Bangalore-based Viravecs Labs in 2014 with the sole aim of being pioneers in genome editing in India.

Dr Rohan and Dr Srikanth obtained their PhDs from ACTREC-TMC (The Advanced Centre for Treatment, Research and Education in Cancer - Tata Memorial Centre), the research arm of popularly known Tata Memorial Hospital in Mumbai.

Post his PhD, Dr Rohan spent 3 years as a DST-Cognitive Science Initiative (CSI) post-doctoral research fellow at NCBS (National Centre for Biological Sciences) in Bangalore.

Being in Bangalore's biocluster, and exposed to all facets of the Biotech industry, the idea to start-off Viravecs Labs was seeded within the founders at Bangalore's C-CAMP (Centre for Cellular And Molecular Platforms), a centre for cutting-edge research and innovation in Life Sciences, where the start-up is currently being incubated.

Dr Srikanth pursued a brief post-doctoral research at Mumbai's TIFR (Tata Institute of Fundamental Research) before joining the IMB (Institute of Molecular Bioscience) at the University of Queensland, Australia, for further research in molecular cell biology.

During his research, Dr Srikanth harnessed the power of molecular tools, including viral vectors and Crispr-Cas9, to

genetically alter various cell lines to study and understand gene functions.

Dr Rohan adds that he and Dr Srikanth continually felt the importance of translational research.

"Both of us share complete knowledge to develop transgenic mammalian model systems using various emerging technologies. During our PhD years, collaborations for these skills helped the participating groups, and the commercial value of the same was also obvious to us. The thought of using our knowledge and skills to make our independent careers pushed us to think of this entrepreneurial journey. The thought was further kindled by many factors including mentoring by the right people; being in close proximity to C-CAMP; the Biotechnology Industry Research Assistance Council's (BIRAC) Biotech Ignition Grant (BIG) scheme provided seed funding for novel, commercial ideas; and more so ever, the now-or never attitude," explains Dr Rohan.

Plan of Action

Once the founders set their eyes on their entrepreneurial journey, the plan of action was a little different for the duo.

"We planned to go ahead only if we were awarded the grant under the BIG scheme. We were totally banking on the scheme for seed fund as we by ourselves were not in the capacity to start-off, especially Biotech being a highly capital-intensive industry. So we focused on writing for the grant and gave our best shot, and it worked! When we were awarded the grant, we went ahead and set-up our company on papers and presently we operate from C-CAMP," says Dr Srikanth.

R&D takes a center stage at Viravecs, wherein platform technologies are developed to create clean model systems for Life Sciences research, with no off-target effects typically caused by collateral damage to genome while using the conventional methods.

As an offset of these platform technologies, Viravecs also provide various genome-editing tools as per the needs of the clientele. "Highly customizable, low turnaround time, and low costs are some of the main features of the products and services offered by Viravecs," Dr Rohan comments.

No Cakewalk

Establishing a brand new lab was an experience of sorts, points Dr Rohan.

"We came to our allotted bench space at C-CAMP with nothing in hand; and when we started we realized the challenge of taking care of numerous trivial and non-trivial things to have a fully functional lab. Also, this was the time when we had to be extremely judicious and efficient in using the funds at hand.

"Every Rupee counts for a start-up lab like ours, unlike in well-established academic or industry lab, where revenue generation and expenditure is quite regularized. Each and every micro tips' cost was now visible. Stepping out of academic labs, where pretty much everything is taken for granted, all of that changed," he reveals.

Although the founders were well aware of their product's market potential, convincing their clients was not easy

"It is difficult to convince especially for a technology that is new, even for labs in the West; and when the technologies for these novel technologies come from a start-up, it is further challenging. However, we are hopeful about the Indian Life Sciences market, which we feel would give us good opportunities to prove our capabilities..." Dr Srikanth says.

It also took a fair amount of time and effort for the founders to understand and execute the paperwork and administrative responsibilities.

"Coming from a completely academic background, understanding the required legal procedures to start and sustain a commercial lab was also challenging," Dr Rohan recalls.

Personal Savings

Viravecs received tremendous help from C-CAMP; BIG partner Kalinga Institute of Industrial Technology - Technology Business Incubator (KIIT-TBI); and the start-up's fellow incubatees like Bugworks and Sea6 Energy.

The seed funding for Viravecs Labs came from BIG scheme offered by BIRAC-Department of Biotechnology (DBT). In terms of investments, all the ancillary cost involved were spent by the founders from their personal savings.

"Since we are at an early stage, the seed fund from BIRAC has been sufficient for running the research. As we progress

through this year, we are hopeful to generate revenues through our technologies, and generate a decent turnover in the next 5 years to attract investments," Dr Rohan opines.

Viravecs is currently working on 3 collaborations in the academics including InStem (Institute for Stem Cell Biology and Regenerative Medicine) and IISc (Indian Institute of Science) in Bangalore, and TIFR at Mumbai. It is also in talks with a major biotech company in Bangalore for 2 projects.

It is also working with Aten Porus Lifesciences to develop novel processes and formulations to deliver genome editing tools in vivo.

Its other collaboration is with Shilps Sciences in using micro fluidics platforms to enhance the robustness of genome editing tools.

Exit Strategy

According to the founder, the start-up's growth plans will completely depend on the funds it raises henceforth.

Dr Rohan says, "We plan to generate ample revenues through our platform technologies. We are also in the process of writing for grants to develop versatile genome editing technologies for small animals. To achieve these targets we plan to expand our research team, and also have a team for marketing. It is too early to talk about our exit strategy, but we feel that we can share our technologies with bigger companies for better reach of our products and services."

Viravecs aims to get in the market by mid-2017. "Alternatively, if we find a suitable partner to take our project to the market a little sooner, we will happy to be associated with them," Dr Srikanth expresses.

Shorter Times

The current schemes which fund start-ups, particularly the BIG Scheme from BIRAC, are providing amazing opportunities for researchers. However, these schemes provide funding for a shorter time of 18 months, which is good enough to test concepts and develop technologies.

"But this time frame is too short to develop the technology into a commercial product and become self-sustainable," voices Dr Rohan. "The transition from early start-up to self-sustained company is difficult especially for Biotech ventures where it takes lot of time and revenues to make a successful product. The next level funding is quite difficult to obtain, and private funding is also fairly difficult at such early stages. It will be very helpful if the Government funding agencies come up with some competitive funding schemes for start-ups which have developed technologies that can mature into successful commercial products."

Academia-Industry

In the West, Academic-Industry partnerships are well defined and mature into fruitful collaborations.

To help academic discoveries translate into commercial products, the Universities and Institutes have close tie-ups with industry, and numerous support systems are in place to achieve this without hurdles.

"India has taken an interesting way to bridge the gap between discovery and translational science by setting up research incubators, especially for Biotech start-ups where the need for established infrastructure is immense," says Dr Srikanth. "The various funding agencies have come up with competitive seed funding for researchers with ideas and plans that has the potential to develop into a successful business. Though the process has started, sensitization of the academia is of utmost importance to translate any part of their research which has commercial potential. Vice versa, the companies can also have tie-ups with academia to develop reagents and technologies that can aid discoveries in sciences."

Killers & Lessons

According to Dr Rohan, the death of a start-up maybe and generally is a multi-factorial process.

"The most important thing that can be a killer is the difference of opinion between the partners in the game. It is highly important to trust each other, define responsibilities, stick to them and ultimately deliver as a team. The moment the team starts becoming 'me versus them', the marriage called start-up begins to fail," he adds.

"The second factor," Dr Srikanth comments, "that would kill a start-up is the lack of funding opportunities. As of now in India,

there are very few schemes which patch up the gap between seed fund and series 'A' funding. The seed fund helps establish the set-up and get going with the PoC. Then there is a need to get the PoC to a sellable level for which funding is scant. A lot of start-ups fail at this level in spite of having potential to survive."

Though it's the beginning of the journey for the founders, they have a lot to share about their entrepreneurial journey.

"For one, 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. There is always something to gain from everyone; and by default there is much to contribute as well. Networking helps connect two or more people whom we may know and are useful to each other; we may gain nothing from connecting them but we know some day they will help us too," Dr Rohan says.

"Secondly," Dr Srikanth shares, "the 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 unit of everything we use 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 start-up."

A major advice that Dr Rohan offers to upcoming Life Sciences entrepreneurs is to have backup funds.

"...With no backup funds, it is very difficult to do business development, and collaborations among others. As a start-up there is an intense need for entrepreneurs to invest capital for day-to-day functioning of the company. If backup funds are difficult, give the start-up idea a second thought!" Dr Rohan advices.

Essential Qualities for Successful Entrepreneurship:

ï‚§ Collaboration
ï‚§ Networking
ï‚§ Open mindedness
ï‚§ Patience