
Scaling Innovation in Genetics and Precision Medicine



By Rachel Eva Lim, INSEAD Knowledge

How biotech start-ups can identify and solidify their customer base, scale their operations and unlock the full potential of precision medicine.

Genetics and precision medicine have grown by leaps and bounds in the past decade alone. Precision medicine in particular – the use of genetic or molecular profiling to optimise efficiency and deliver a targeted diagnosis tailored to the individual patient – is a burgeoning field, largely thanks to recent advances in technology.

As more start-ups enter the scene, how can they establish a robust customer base, integrate their inventions with existing healthcare systems and ensure they have sufficient resources to scale and grow effectively to facilitate equitable access to these advancements without depleting resources?

In a recent [Tech Talk X](#), INSEAD Professor of Technology and Operations Management [Stephen E. Chick](#) spoke with a panel of experts in genetics and precision medicine. They were [Julien Rey](#) (MBA '14J), co-founder of [FBB Biomed](#), which measures RNA biomarkers to detect a range of neurological diseases; [François Paillier](#), CEO and co-founder of [CircaGene](#), which

produces self-test DNA analysis kits; and [Konstantinos Theofilatos](#), co-founder and CTO of [InSyBio](#), which harnesses big-data computational tools to discover biomarkers for cancer, neurodegenerative diseases and nutrition.

The evolution of precision medicine

Chick opened the discussion with his observations on the growth of precision medicine. “The cost of sequencing genetic information has been dropping dramatically, even faster than the rate of improvement in the cost of computing resources,” he said.

As the cost of obtaining genomic data has decreased, companies are developing and launching exciting new business models. Chick pointed to rare diseases and oncology as two areas in which precision medicine is currently being used to provide more personalised diagnoses for patients based on their [biomarkers](#).

Chick also referenced INSEAD’s [collaboration with Amsterdam UMC](#) and other partners to develop [targeted diagnostic treatments for sepsis](#) – the number one killer of patients in hospitals – for people with different types of genomic or [RNA transcriptomic](#) profiles. There is much untapped potential in the field, and start-ups can take advantage of this to design new, innovative and equitable solutions around personalised medicine.

“A biomarker is no good unless you can make a better decision with it, so the core question becomes how can we make meaningful use of that information,” Chick said. “Let’s not be dazzled by the science. Let’s be dazzled by the great things we can do by making better decisions around that science.”

Understanding the value proposition

Chick’s first question for the speakers was how they approached customer development. Paillier highlighted the importance of speaking to patients, healthcare providers and other potential customers to clearly identify the problem and assess the market before getting to work. “From an entrepreneurial point of view, the worst thing ever is to fall in love with your technology,” he said. “Don’t focus on the technology or the solution, start by identifying a problem that needs to be solved.”

Paillier added that comprehensive market research can help firms gain a better understanding of the competitive landscape and, crucially, determine whether the market is already saturated. “If there’s not much to provide, your value proposition will be weak. You need to have a big gap between what is existing and what you are proposing,” he said, while also emphasising the need to engage with early adopters to get a product or service off the ground.

Rey explained that FBB Biomed focuses on diagnosing multiple sclerosis and Parkinson’s disease as therapeutic options for these conditions already exist. While the company has developed diagnostic solutions related to Alzheimer’s disease, it is unlikely to launch these at this time as there is currently no proven, highly effective drug to treat the condition. “We decided to [focus on] the neurology market because there are no reliable diagnostics that exist today that are blood- and RNA-based with high accuracy... and [this is] underserved and overlooked,” he said.

Theofilatos stressed the crucial role that venture capitalists and early-stage investors play in getting biotech start-ups off the ground. “Companies like [ours] need to front-load investments [in order to] build the credibility and the technology,” he said.

He added that even after developing a product that customers want to use, it’s important to establish credibility through the likes of case studies, scientific publications and white papers. Companies should also prioritise fostering a network within the industry that can help them access new markets. “It’s all about network in pharma. It’s very important to be open to collaborations and not try to do everything by yourself,” he said.

Scaling inventions

Another key challenge facing biotech companies is scaling up their product or service. Theofilatos and Paillier said their firms leverage existing technology to do so. For instance, modern commercial platforms have enabled InSyBio to validate large amounts of data, and secondary data repositories have helped CircaGene detect gaps in the market.

Paillier also noted the importance of identifying bottlenecks – be it in funding, technicalities or regulations. “It’s challenging to access funding right now, so make sure you maximise the value according to the money you have,” he said. “[With] AI, you can really develop something quickly and cost-

effectively. It's complex and time-consuming to navigate the regulatory landscape, so think about how you are going to switch your go-to-market strategies [in these different places]."

FBB Biomed and CircaGene conduct genetic testing through a partner – meaning that for these companies to scale, this needs to be done in tandem with other stakeholders within their network.

"If your goal is to grow exponentially, you must find a way to decouple your operations from your growth. Otherwise, you will have to grow at the same rate at which your sales are exploding, [which] is not physically possible," Rey said. He stressed that prior to entering the commercial stage, companies should have established a completely automated system. FBB Biomed, for instance, used subscription-based software services – as opposed to hardware – to minimise their spending and cash-burn rate and optimise their operations.

Building trust for the future

Chick then posed a question from the audience about how start-ups can build customer trust and confidence in their systems. Paillier revealed that CircaGene invented and patented an encryption technology to secure patients' DNA, while Theofilatos stressed that AI tools do not operate in isolation.

"Being based on AI predictions is no different than being based on biochemical examinations," Theofilatos said. "These are not models that make decisions [on their own] – they are supportive tools for clinicians, to assist them in making decisions [as they have] more information available and more guidance about what the data and the measurements [reveal]."

Wrapping up the discussion, Chick asked the panellists for their advice for start-ups. Paillier emphasised the need to secure funding, establish a proof of concept and minimise cash-burn rate before scaling up. Theofilatos talked about the importance of connecting with a diverse group of experts to create a strong network.

"Always keep in mind that you know a lot less than you believe," Rey said. "There is no way to know what you don't know other than to be exposed to it... [so] speak to different stakeholders because you will get a much deeper understanding of the ecosystem in which you operate."

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