Human ingenuity and machine intelligence accelerate the discovery of advanced medicines with LabGenius

As part of our quick fire questions series – or QFQs – we spoke to James Field, founder and CEO of LabGenius about combining human ingenuity and machine intelligence to accelerate research into advanced medicines, liquid handling robots and how to divide and conquer.

At *LabGenius*, we're building a smart, robotic platform (*EVA™*) that combines the *very* best of human ingenuity and machine intelligence to accelerate the discovery of advanced medicines.

What was the catalyst for launching the product?

At the end of my undergraduate degree, I took part in the international Genetically Engineered Machine (iGEM) competition and fell in love with synthetic biology. This was really a turning point in my professional

development and the experience spring-boarded me into an MSc in Systems and Synthetic Biology, and from there into a Ph.D.

During my Ph.D. studies, I had the opportunity to work on novel protein engineering methodologies that were underpinned by recent advances in synthetic biology, automation, and computation. It was at this time I felt a growing conviction that these approaches could make a meaningful contribution to the development of novel protein therapeutics and so LabGenius was born.

Tell me about the product – what it is, what it aims to achieve, who you work with, how you reach customers, USP and so on?

To develop a novel therapeutic, you need to find a molecule that's not only efficacious but also safe, manufacturable, and stable. Optimising a molecule across all these different properties is immensely challenging. When progressing a molecule through the discovery process, trade-offs invariably get made between different properties. These trade-offs can reduce a molecule's therapeutic potential and lead to costly failures or sub-optimal patient outcomes.

At LabGenius, we represent a new breed of biopharmaceutical company that's working to unlock the next wave of scientific breakthroughs by combining the very best of human ingenuity and machine intelligence. Our multidisciplinary team is combining robotic automation, synthetic biology and machine learning to build a smart robotic platform (*EVA™*) that's capable of designing, conducting and learning from its own experiments.

EVA™ uses machine learning to model multiple therapeutically valuable protein features. These models can then be used to rapidly optimise across the corresponding features simultaneously. Our modelling indicates that the molecules we identified using our approach are very unlikely to have been found using conventional methods.

How has the business evolved since its launch?

In the early years that followed LabGenius' inception, knowing that around 90% of startups fail, a top priority was to gain financial stability. To do this, we

secured a government grant and a number of small projects spanning the field of synthetic biology, one of which was a contract with The Ministry of Defence. All the while, this enabled us to build the foundations of our closed loop technology platform that applied data science to unsolved protein engineering challenges.

In 2017, we secured our first round of venture financing. This was a big moment for the company, fuelling the growth of the team and the build out of our 4,000 square foot automation lab in the heart of London. As we turned our attention to a next round of funding, we began to hone in on therapeutics.

With our direction defined and more technical proof points under our belt, we closed a $25M Series A with Atomico, Obvious Ventures and Lux Capital. With this resource, we've repeatedly demonstrated, through both internal and partnered projects, that machine learning can be used to dramatically improve a protein's performance across multiple features simultaneously.

What is your favourite thing about being a founder?

For me, one of my favourite parts of any day is when I walk into our state-of-the-art protein engineering facility and find myself surrounded by banks of liquid handling robots, each of which is conducting its own set of experiments.

It's at these moments that I'm struck by how far the company and the team have come since my Ph.D. days.

Which founders or businesses do you see as being the most inspirational?

At LabGenius, we're privileged to benefit from the expertise of some of the world's leading drug discoverers, technologists, and scale up professionals.

An industry luminary that I often look to for inspiration is Recursion's cofounder and CEO, Chris Gibson. With Chris at the helm, Recursion is really driving the future of medicine through the deep integration of technology into the drug discovery process.

Another of our advisors that I turn to for wisdom is Ex Google CFO, Patrick Pichette. In fact, we regularly invite our advisors to attend company wide sessions so that they can share their experiences with the team first hand. Most recently, at a company Q&A, Patrick shared his sage advice for scaling

with efficiency. It was incredible to hear him talk so candidly about the challenges associated with scaling a business, and also reassuring to know that they are so often common to most, if not all businesses at one point or another.

You can find Patrick's insights in our recent blog post, published here.

What has been your biggest business fail?

At the beginning of most startups, you are running on a shoestring. This was especially true for LabGenius. After two years on minimum wage, my wife understandably started to get a little worried. When we found out that we were expecting a baby, we agreed that if I hadn't raised our Seed round by the time our daughter was born, then I'd *'get a real job'* (not my words). The race was on. I worked to the deadline….. and missed it (but only just). A few hours after my daughter was born, I snuck out of the maternity ward to close our Seed round from a phone in the hospital car park. Definitely not a win.

What are the things you're really good at as a leader?

A big challenge faced by founders is developing and maintaining emotional resilience. The job requires you to be irrationally paranoid about the existential threats that the business faces while simultaneously maintaining a relentless optimism about your venture's future potential. This tension means that throughout any day you'll experience dizzying highs and real lows. I'd like to think that I've been in the saddle long enough to become pretty emotionally resilient. To maintain sanity, I often reflect on the Scott Galloway quote: "*Nothing is ever as good or as bad as it seems*".

Which areas do you need to improve on?

It's clear that many of the best ideas are forged at the interface of disparate disciplines. Therefore, At LabGenius, we have always encouraged multi-disciplinary working in all its forms. Over the course of the pandemic, this was much more challenging. As CEO, I believe that there is more that I can do to help blur the lines between functional teams and promote seamless ways of working together and this will be a key area of focus for me in the coming

weeks and months.

What's in store for the future of the business?

Now that we have an established platform that has successfully delivered multiple internal and partnered projects, we are starting to invest in a wholly-owned pipeline of drugs. Four years from now, the goal is to have a therapeutic asset in clinic trials and several more following closely behind.

What advice would you give to other founders or future founders?

My core advice is *'divide and conquer'*. You can't learn everything so be highly intentional about how you and your founding team allocate time. I've seen this done especially well between co-founders which allows one person to focus on the business side while the other can dedicate their time to the science. Where you are going up a steep learning curve, try to short circuit the process by surrounding yourself with trusted mentors who you can learn from.

And finally, a more personal question! We like to ask everyone we interview about their daily routine and the rules they live by. Is it up at 4am for yoga, or something a little more traditional?

Come rain or shower, I'm always out at 5 am every morning for a 4 mile run after which it's on with the banana, milk and raw egg smoothie — all topped off with a pinch of cinnamon…

As much as I wish this were true, in reality, my 2 year old son is always the first up in our house and makes damn sure that the rest of us are wide awake and primed for the 6 am showing of Go Jetters on CBeebies. Once the kids are up, dressed and cracking on with breakfast, I see to our two tortoises (Bill and Big Boy T) — disclaimer — names were not chosen by me. Several cups of tea later, it's a mad dash to get our eldest off to school and to get myself off to the station for the Southern Rail experience.

James Field is founder and CEO of *LabGenius.*

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