SCOTTISH MORTGAGE INVESTMENT TRUST

Enveda: Finding Hidden Medicines in Nature

Viswa Colluru (VC): If you can find better chemistry in nature that has been selected for billions of years then you can find better medicines.

Tom Slater (TS): Very simplistically, you're aiming to use AI to scour thousands of plants for potential breakthroughs in drug discovery.

VC: We want to be a trillion-dollar company that has multiple blockbusters, and I think over the next six quarters, we have a dozen clinical catalysts over four programmes that have multibillion-dollar sales potential.

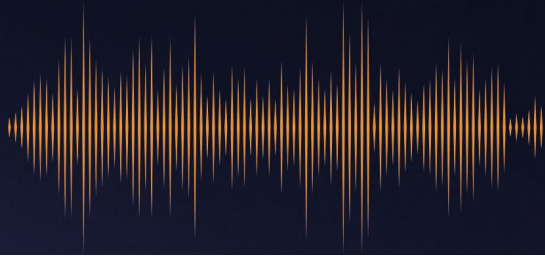
TS: Healthcare is the biggest industry in the world, and if you can increase the odds of success in drug discovery, there are so many unmet needs that its opportunity is effectively unbounded.

Claire Shaw (CS): Hello and welcome to season four of *Invest in Progress* – the Scottish Mortgage podcast. I'm Claire Shaw, portfolio director. We take you behind the scenes to hear conversations between our investment managers and leaders of exceptional growth companies they have backed.

As a UK investment trust, we can only market Scottish Mortgage to certain audiences and geographies. So, check out the podcast description to ensure this episode is suitable for you. And as with any investment, your capital is at risk.

You're about to hear from Viswa Colluru – founder and chief executive of Enveda. The biotech company is mapping nature's chemistry to tackle some of today's hardest-to-treat conditions. You've likely already used bio-sourced drugs. Morphine from poppy plants and aspirin from willow bark are two. Enveda builds on this tradition with a technological twist. It combines artificial intelligence with molecular science to explore the vast number of compounds present in plant matter and reveal their effects.

An in-house large language model sits at the heart of its platform – the same AI technology that powers Claude and ChatGPT. But instead of a chatbot, Enveda's model identifies molecular structures in nature. Then the firm screens them to find promising drug candidates. As you'll hear, Enveda has a deep pipeline of potential treatments, including a new therapy for eczema and asthma in clinical trials. Drug development always involves risks. But Enveda's novel approach –



combining Viswa's scientific vision with breakthrough AI technology – convinced us to take a small position in the private company just over a year ago.

Scottish Mortgage manager Tom Slater met with Viswa Colluru in London late last year – let's hear from them.

TS: Viswa, great to have you here. Thank you so much for doing this, and especially straight off the plane from the US.

VC: Thank you. The pleasure is all mine.

TS: Well, we ask all our guests the same opening question. Can you explain what Enveda does and what problem the company is trying to solve?

VC: Yeah. Enveda was born out of a simple realisation that there's really only one problem in the pharmaceutical industry, and it's that things that work in the lab don't work in people. And when I began to view the world through this lens, I had a very, very simple realisation that what if you just start with things that have a better chance of working with people and or have signals that you could believe that they already do work in people. Just like aspirin came from the willow bark, or artemisinin came from the world around us, or morphine and metformin – drugs that we still use today that touch and improve billions of lives.

And no one could give me a sufficiently discouraging answer as to why I should not pursue that simple line of thinking to its logical conclusion. And so I decided that we should go back to one of the most exciting, validated, intuitive, but unfinished ideas, which is to focus on chemistry that the human race has sampled for a very, very long time, so that we can find the next aspirin in weeks instead of decades and centuries.

So that's a problem we're doing, is bringing a chemistry-centric view of the world to create better medicines faster that have an improved chance of working in clinical trials.

TS: And your story of how you got here is fascinating. You have family connections in the pharmaceutical industry, but there's also some deeply personal motivations behind your story. So can you give us a little bit of your background, where you were raised, how that shaped your mission?

VC: Absolutely. I was, you know, born and raised in middle-class South India. And like any good South Indian boy, I wanted to study computer science and work in Silicon Valley. So medicines, biology and the pharmaceutical industry were not on my mind, not even on my radar at all, until my mother got diagnosed with chronic

myeloid leukaemia [a type of blood cancer that affects white blood cells] in the late 90s, which was effectively a death sentence.

And in the same breath that the doctors told her she had cancer, they told her that she had about five years to live because there was really no treatment. That shaped my own journey as a child, along with the fact that our family had to navigate pretty difficult financial circumstances in order to pay for her care in a time and place where medical insurance was not something that permeated through the Indian middle-class fabric.

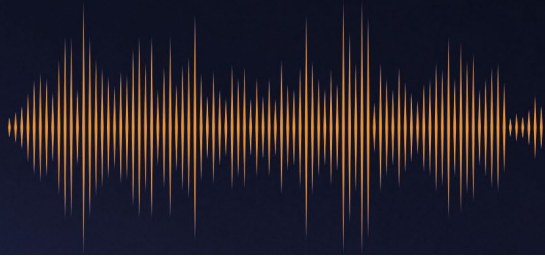
And so, I learned entrepreneurship from my mum, who, after about 15 years of being out of the workforce, launched home-based businesses to pay for her own care. And maybe more importantly, I learned what it took to live and love fearlessly. Because going back, there's not a single day where I can remember my mum showing up like a patient.

And she won many, many battles, but ultimately lost the war. And I was about 13 years old at that time. And it became very, very clear that the purpose in life that I was going to pursue was to ensure that at least one mother doesn't hear the same words that mine did.

And it's been a straight shot since where, you know, I decided to jump in both feet and study biology in undergrad and chemical engineering, biology, I barely passed in high school.

So that was a fun transition. And fell in love with molecular biology and understanding the inner workings of a cell. Thanks to two textbooks, both of which were written by professors at the University of Wisconsin. So, I moved from sunny South India to sunny Madison, Wisconsin. And since maybe most of your listeners are not from the United States: Madison, Wisconsin can get very cold. My first winter, I experienced negative 40, which is where both the celsius and the fahrenheit scales converge. So, units are meaningless.

It's also the temperature at which your nose hair will instantly freeze, in case you were curious. But I learned a lot of extremely interesting biology at that time and found myself at the intersection of the immune system and cancer, nucleic acid vaccines [vaccines that use genetic material such as DNA or RNA to train the immune system], so mRNA [messenger ribonucleic acid - a molecule that carries instructions to make proteins in cells] and DNA, and tumour immunotherapy [treatments that help the immune system recognise and attack cancer] before it was called immuno-oncology.



So we were about five to 10 years ahead of our time, and that taught me a very, very important lesson is usually we tend to be preoccupied with ideas that are new. But those that end up changing the fabric of our lived experience are usually old.

Immunotherapy was over a century old, you know, statins [widely used drugs that lower cholesterol and reduce heart-disease risk] many, many decades in discovery, transplant medicine, rapamycin [a drug that affects the immune system and some ageing-related biological pathways], but even beyond, you know, the biomedical sciences, whether it's the steam engine or alternating current, rockets or space flight or the light bulb, it's usually many, many centuries. So, I realised that, you know, I was going to always pursue ideas that were unfinished.

And that took me to Recursion, which is also a Baillie Gifford Scottish Mortgage portfolio company, where I was an early employee and spent time across science product and commercial strategy for a few years before I realised that everybody was focused on biology to solve the problem of things that work in the lab, not working in the clinic. And there was a unique opportunity to instead focus on the best chemistry that the world had to offer. And so I made the very rational decision to put all of my life savings in a Delaware C Corp in 2019 and start Enveda.

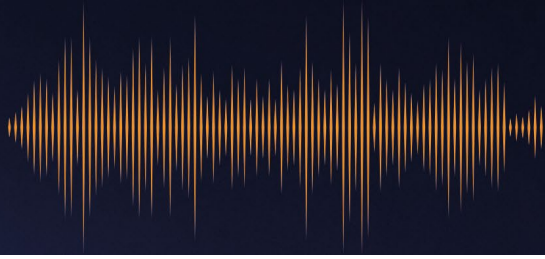
TS: So it's clear that losing your mother gave you this unshakable sense of purpose.

VC: Yes.

TS: And I know from other founders whose companies we've backed that can create an almost unstoppable drive. But moreover, you didn't just found the company, you funded it. So how much of a leap of faith was it to put your own savings into Enveda?

VC: You know, when I was contemplating starting the company, I had several months of severe anxiety and panic attacks, which I've now since begun to recognise as par for the course. But I realised I was confronting, you know, childhood trauma of being sick and not being able to pay for it. Because I had only held a stable job for, you know, nigh over two years, and I was giving up insurance and giving up my salary.

But there's, I felt that I had, I was, I almost owed it to the universe to give this idea a try because you needed to have been, you know, born and raised in a culture where using nature as medicine was not alternate, it was just medicine.



And then I needed to have been educated with the highest levels of scientific rigour and then find myself at a unique point in time where there were companies like Recursion that were questioning rules and managed to get investors like Baillie Gifford interested in the answers to those questions.

And I felt like if I had let that moment pass, maybe the idea would not be revisited for a very long time. And once I framed it as not being about my own success or my own career trajectory, it became very easy to make that leap. And once you do, I always believe in burning the metaphorical boats, so to speak.

And I had $55,000 of it, and I realised this was a decision that both my eight-year-old self and my 80-year-old self would be proud of. And not doing it would certainly fill me up with a heavy dose of regret.

TS: So almost like the Bezos regret minimisation hypothesis [Amazon founder Jeff Bezos's suggestion that faced with a decision, you project yourself into the future and ask if you'll regret not taking a leap now]**.**

VC: Absolutely.

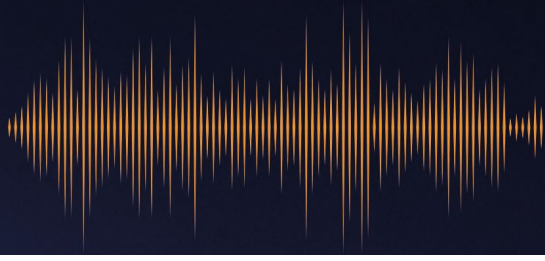
TS: And I think in the past, you've used the phrase that your aim is to pick up from where evolution left off.

VC: Yes.

TS: So natural product drug discovery [finding new medicines from compounds that occur in nature, such as plants or microbes] isn't new, it's actually quite old. And very simplistically, you're aiming to use AI to scour thousands of plants for potential breakthroughs in drug discovery.

So, before we get into the science, I think it would be interesting for our listeners to understand more. You talked about many of the world's most important medicines coming from plants. What was it about that point in time in 2019 where you owed it to the universe – I love that turn of phrase, as you put it, to pick that up again? What was it about that moment?

VC: You know, being completely candid, there wasn't a specific fact or technological breakthrough I was privy to. It was just that the idea that had served the industry since the 1700s, which is when the first, you know, formal medicine in a bottle was sold, it was essentially like it hadn't been revisited since the late 90s. And if I, and when I looked around, I saw that, you know, between the late 90s and 2019, the world got the internet, we got a supercomputer in our pocket, we went



through the mobile cloud eras, and we saw the Transformer paper being published along with a host of other breakthroughs.

When I asked the simple question, picking up where I left off on one of my earlier answers, on why is it that we cannot take plants that millions of people would be unsurprised if it yielded a medical breakthrough or a pharmaceutical breakthrough, and deterministically find a medicine from it, the answer really came down to the fact that chemistry never had its sequencing moment [a breakthrough equivalent to DNA sequencing, which transformed genetics].

So in other words, you know, today I can swab any sample on the planet, and I can extract the genetic material, and I could sequence the genes by asking, you know, what is the sequence of the nucleotides [the chemical "letters" that make up DNA and RNA] and what do those sequences in other places do? But humanity has never done the equivalent for an organism's chemical code. So, I can't take, for example, a vial of your blood or a little bit of this water and ask: what are all the chemical molecules in that sample and what do they do?

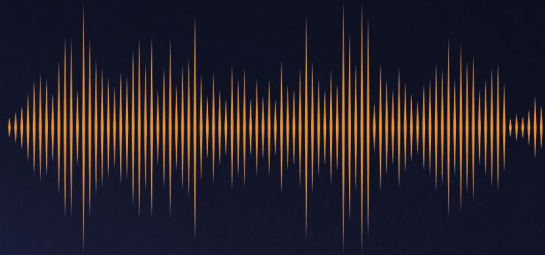
In other words: what is the structure and function of the chemistry of the living world? And it seemed like that problem, from a pure technology perspective, had a meaningfully different chance of being successful in 2019 than it did in the late 90s. And it was something that I knew if we could crack, not only could we take the world's most powerful chemistry and put it in the hands of scientists, but perhaps we could also understand what it meant to be alive better.

And this is one of my favourite refrains, which is, you know, a dead cell and a live cell have the exact same genes. The thing that makes a cell alive is its dance of metabolism [the network of chemical reactions that keeps cells and bodies alive]. About 80 million reactions on average in every adult human cell.

And from a more practical perspective, it's what turns your breakfast into you. And that was something that, you know, I couldn't set aside.

TS: The core premise of Enveda is that nature's chemistry holds a vast, untapped reservoir of potential drugs. I think you've said that only a fraction of nature's chemistry has been mapped, perhaps only 1 per cent. But only now do we have the tools to map this. Now, you referenced the paper on Transformers, which obviously underpin large language models [LLMs], the same technology that's behind Claude or ChatGPT.

So, most people associate that technology with chatbots. For a non-specialist audience, how does Enveda's AI platform actually work in practice? What's the



simplest way to explain turning nature into data and finding that next hundred aspirins?

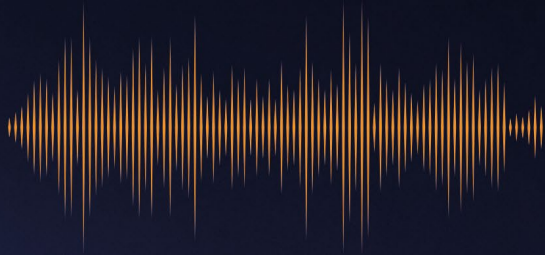
VC: Yes, that's a fantastic question. And, you know, I'll actually just ground it in the thesis. The thesis for the company is that if you can find better chemistry in nature that has been selected for billions of years and perhaps annotated by our ancestors, then you can find better medicines. And as you pointed out, this idea is both intuitive and validated with nearly half of all FDA [US Food and Drug Administration]-approved small molecules coming from nature, but it's also untapped. In fact, we estimate that somewhere around 99 plus per cent of the world's chemistry is unknown.

And to put that in context, if I take a vial of your blood and put it in a mass spectrometer [a lab instrument that measures the mass of molecules to help identify them], which is an instrument I'll come back to when answering your question, I can detect thousands of compounds, but the best labs in the world can annotate about 10 per cent. In other words, identify about 10 per cent. So if you compare that to genes of viruses from the bottom of polar ice caps, which you can because scientists have gone and done that experiment, we know more about the genes of these viruses, nearly about 35 per cent, than we know about the chemistry of human blood. So that is the state of affairs.

The bottleneck was you never built the sequence of a chemistry. So our choice was very, very clear. How do we build the sequence of chemistry using either hardware, like fundamentally reinvent, you know, laboratory instrumentation. Or, how do we interpret data that's already being generated by some incredible instruments that humanity has invented? And for that, we chose this instrument called a mass spectrometer. A mass spectrometer, as the name suggests, measures mass.

But it does so at two really brilliant levels. One is it can take the sample and quickly measure all of the masses of the molecules contained therein, but then it takes each molecule, and it accelerates it through neutral gas till the weakest bonds wiggle and break. And then it generates the mass or captures the mass of each of the fragments of a molecule. So, in other words, think of it as a fingerprinting machine.

It takes a molecule, generates a mass, and then shatters it and generates the fingerprint of all of the masses. So, each molecule in a sample has a fingerprint. Now historically, this fingerprint of masses has only been used by scientists to rediscover known molecules.



So, going back to our problem, we asked, what if you could actually predict faces from this fingerprint? In other words, you know, not just the ones where we've already gone in and identified, but ones where maybe you could reconstruct these fragments together to predict the face.

Now, historically, this has been a very difficult problem. And when scientists have used traditional machine learning, which is to provide enough examples of fingerprints and faces, they actually saw that it doesn't work. And one of the things that made it not work was the same thing that made computers really bad at language till LLMs came by. So even if you trained on millions of sentences between, say, English and Hindi, when you gave it a new sentence or a new combination of words, all these AI models would fail before LLMs.

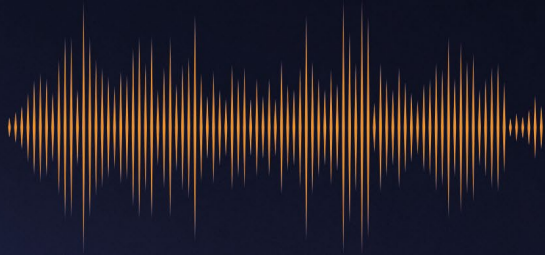
And the reason for that was that language, just like these fingerprints of masses, were deeply context dependent. And I'll give you an example to illustrate. So if you take the sentence, the animal didn't cross the street because it was tired. The word 'it' is, and the meaning of the word 'it' is dependent on the last word, tired, right? Because you know the word 'it' is referring to the animal.

But if I change that to the animal didn't cross the street because it was crowded, now the word 'it' refers to the street.

And I can change that to the animal didn't cross the street because it was raining. Now, the 'it' actually refers to a subject that's not even in the sentence, which is the weather. And this would essentially throw off these neural networks until LLMs came by and actually showed that you could teach computers to get trained based on context. In other words, learn that the meaning of any one part of that sentence could change based on the other parts.

And we realised that this grammar was also present in the world's chemistry as assessed by mass spectrometers in these fingerprints. So rather than depending on the tiny amount of training data, the 1 per cent, the few thousand molecules where humans had both understood the chemical structure using painstaking laboratory methods and had generated fingerprints, now the entire world was up for grabs because we could train on molecules we didn't yet understand and train on molecules that we knew were grammatically correct and actually translate between the two.

Just like LLMs, even though they hallucinate, if you've ever given them a translation task, they're near perfect. So we translate between the grammar of



chemistry as represented in mass spectrometry data to chemical structure as usable for drug discovery.

TS: That's fascinating. We could talk about that for the rest of the session.

VC: Absolutely.

TS: But let's move on. How do you go from identifying a compound in a plant to creating a drug that's ready for human trials? Walk us through that process.

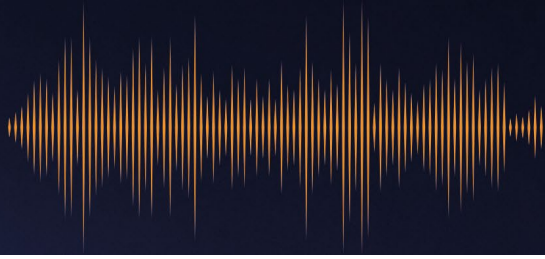
VC: Yes. The first most important thing that we do is decide which diseases today have an unmet need that present a meaningful commercial opportunity. So for example, if you have an inflammatory disease [diseases caused by an overactive immune response, such as some skin and bowel conditions], we have a real need for safe oral medicines that have a profound anti-inflammatory effect. Once we start with a disease, we actually reduce that disease to a series of models or pathways, but we don't actually reduce it to a single target.

And this is where a chemistry-first approach is distinct from the rest of the industry. The rest of the industry would start with some disease area, but try and bring it down to a single protein target. What we do instead is we say: what are the various ways of faithfully representing this disease in its various degrees of complexity in the laboratory? And then we stop.

We don't actually claim to or try to understand biology that is inherently complex using a reductionist lens. Because once you have a model of biology, either that is a pathway, an organoid system [miniature, lab-grown versions of human organs used to study disease], or mouse models [laboratory mice bred or modified to mimic human diseases for research], you can then probe it with chemistry that you think has reason to believe to be successful, but you don't quite know how it works. So, aspirin came about and then taught us about inflammation, rather than our knowledge about inflammation giving us aspirin.

The same thing about morphine and opioid receptors and pain, and rapamycin and ageing circuits, or even warfarin and blood thinning. So, our bet is that you have a pool of chemistry that you think will have an effect on the disease biology, represent this disease biology and essentially put them together.

The secret sauce at Enveda is historically you've needed to only do this one molecule at a time. But because of what we can do on the Enveda platform, we can annotate a mixture with structure and function without needing to isolate. So now you have tens of thousands of molecules from dozens initially, and now going



on thousands of plants at the company. And we probe biology that we think is causal to the disease, but we're agnostic to how it actually works from a single target perspective.

We then put it together and identify interesting chemistry that we can manipulate and manufacture to create population-scale solutions, and then identify how it works. So, you have a model of inflammatory bowel disease and a couple of very interesting pathways. You probe it with chemistry, you identify things that work and then deconvolute the mechanism [untangle and understand how a drug actually works in the body] to discover something. Usually we find more often than not that modern science has not yet discovered is a plausible mechanism to treat that disease.

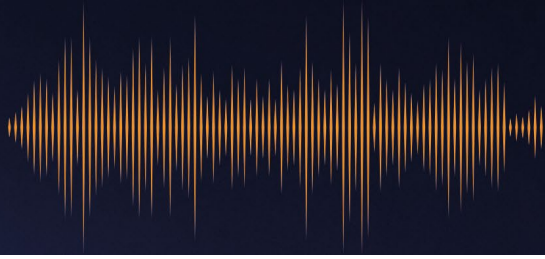
We then put it through the same paces as you would any other target-based or traditional pharma-based discovery. We ensure that the molecule is likely to be very safe in the patient population, that it is much, much more likely to be effective than harmful when viewed from an efficacy lens, and that we can reproducibly produce it from batch to batch.

TS: You've suggested that for decades, drug discovery has been slow, expensive, unpredictable. It's a broken process. What are the points of failure?

VC: It's usually just one point of failure, which is that the summation of hypotheses leading up to a clinical trial are insufficiently predictive for whether you will succeed. That is the primary choke point. And the industry has tried to identify the various ways in which these failures are engendered, so to speak. And to some degree, they're all reductionist, but they fall in three buckets.

One is the molecule had toxicity issues it could not predict. Two, the molecule did not have the efficacy that you predicted. Or three, the molecule did not get to the organ, so it did not have the right amount of availability in the plasma. So, when you take it orally, does it get into the blood and get to where you need it to? And all of modern discovery, to some degree, is various steps removed from trying to de-risk one of these three things. But the specific one that, you know, Enveda has taken a very different approach at solving is the one around efficacy.

So humans for the last 25 years, you know, or so have sequenced the genome [the complete DNA code of an organism and the process of reading it] and have essentially confused the map for the terrain. We think that as long as you can find a correlation between a single gene and what is a complex multi-organ disease,



that if you can just find the right chemistry for that one target, somehow, you'll end up with a successful medicine.

And I think biology is far more complex than that. And I think embracing this complexity is something that I'm very excited about using Enveda's approach and using modern AI is not, quote unquote, electrocuting the horse, but really inventing the car. And that's what I'm very, very excited about.

TS: What do you think most people misunderstand about what it actually takes to make AI valuable in drug discovery?

VC: I think this is at least my current point of view until I change it, which is the current methods and paradigms of discovery were largely forged when we thought of biology as linear. We ignored complexity. We ignored the dynamism of living systems. We ignored the fact that genes are just information. And we thought that as long as you could find a magic bullet to hit any particular protein, you would find treatments.

So, when we now have the power of AI in the palm of our hands, it's very tempting to say: I'm just going to run the same process, but I'm going to do it with more prediction and less iteration and so on and so forth.

But I think we really have to ask ourselves, what would a reimagination of drug discovery look like if new paradigms were enabled because of technology?

So for Enveda, that became taking the process that led to the discovery of aspirin and morphine, or even insulin and GLP-1 [glucagon-like peptide-1 – a natural hormone targeted by diabetes and weight-loss medicines] in terms of new hormones and turning that process into something that we can scale with serendipity. Maybe there are other things you can do that allow you to design drugs against multiple targets at once. But what I would urge my fellow entrepreneurs in the industry is to not electrocute the proverbial horse to get a faster carriage, but invent the car.

TS: So you do the AI-driven drug discovery in the US and the drug development, manufacturing etc, in Hyderabad.

VC: Yep.

TS: So the split's fascinating given that many biopharma companies try to centralise what they're doing. So what are the benefits of building the company that way?

VC: You know, this split actually started because it was necessity. We did not have the benefit of a large venture incubation round [very early funding plus hands-on support from investors to get a company started] and therefore needed to create really nimble, really inexpensive laboratories to do wet lab experiments [lab work involving real biological samples, liquids and chemicals rather than just computer models] where you couldn't predict, miniaturise or otherwise automate. And that, today, has turned into a massive strength for the company. And I describe it, you know, our operations in a very simple split.

Boulder discovers new molecules from the world. And our site in India, in Hyderabad, turns those molecules into medicines. In other words, we do our mass spec and our discovery and our prediction, anything that can be miniaturised or automated or predicted in the US, because that's where the best talent, the best technology, and the best support lies for that.

But then, once we discover a molecule, largely the west, the United States and the UK, for the last 30 years, have been outsourcing this process of making variants of this molecule and testing it in experiments that really cannot be predicted or cannot be automated or miniaturised to China and India. So we realised the best talent in the world for those activities are actually there.

And what if, rather than throwing it over the wall to a dispassionate contract research team [an external lab hired by drug companies to run experiments and tests], you brought them in, made them part of the discovery process, and took advantage of that. And what we're finding today is that we have about a 3-4x advantage in terms of time and cost relative to even the biggest pharma companies in the world that have the most favourable contracts outsourcing it because the team feels like it's their project. And they're in the same labs, effectively, next to each other, advancing this molecule forward.

So, to boil it all down, you know, the sun never sets on Enveda, as it was said about the British empire a couple centuries ago. And that allows us to take every dollar that our investors entrust us with, and assuming no advantage of our thesis, just purely around our hybrid model, generate three times more drugs than the industry average. But if you combine that with our thesis, we now actually can generate 10 times more drugs per dollar because of the advantage of standing on top of nature's shoulders.

TS: And you now have a dozen potential therapies in your development pipeline, which is quite incredible, you know, sitting six years after the founding of the

company. And that spans dermatology, inflammation, obesity, more. So how do you prioritise what to work on and which assets to move forward?

VC: You know, one of the big lessons that I learned early on in this industry was that you have to generate meaningful clinical success before you run out of time and money.

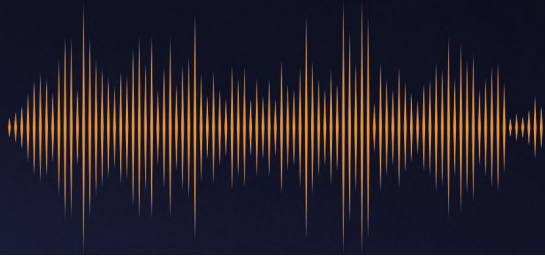
And that is the clock that, as a team and as an entrepreneur, that we're running against. And that has a few different pieces to it. One is, even if you doubled or tripled the rate of clinical success or quadrupled, you still have only a fraction of a chance that any one medicine would work. So that's part number one. And therefore, you need to create multiple shots on goal.

Second is that this clinical success needs to be meaningful. In other words, going after a condition with hitherto unknown or uncertain commercial prospects would not allow sufficient underwriting of value. And therefore, we decided to put our money where our mouth is and our medicines where our mouth is and actually say at the end of the day, any biotech company that is seeking investment is making one pitch, that we can make better medicines, right?

So, let's actually go up against conditions that affect millions of people, that you wake up and recognise because your family or your friends have it, and actually see if we can improve the ceiling of care through better convenience, safety or efficacy. So that's number two. Go after large indications that have intense competition but have incredible opportunity if you can raise the ceiling.

Then number three is do so before you run out of time and money, which means actually that you have to choose indications that aren't just extremely commonplace, but where there is a good regulatory precedent, clear clinical trial endpoints [the specific outcomes that trials measure to decide if a treatment works], and the ability to get to proof of concept quickly. So even though we have a number of different drugs and we became clinical stage in just four years from our seed financing [a startup's first significant round of outside investment], and hopefully by the end of this year we'll triple to three candidates in the clinic, all of those will reach what we like to call proof of concept within about two years and just $20m invested, which is a small, small fraction of the $1bn to $2bn that you need for ultimate success.

TS: One of the global pharma giants, Sanofi, invested in your business earlier in 2025. That's a significant validation of the approach, but it also raises questions given Big Pharma's history of acquiring promising biotechs and stifling that



entrepreneurial spirit, which I think you've captured so well today. So, can you tell us how you're going about balancing your desire to retain control against the benefits of partnering early with big pharmaceutical companies?

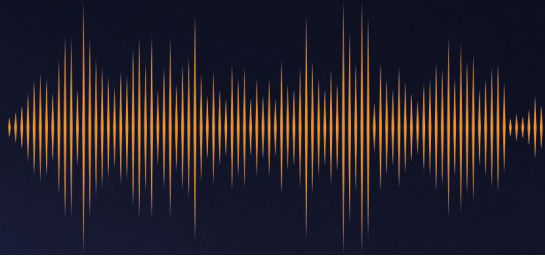
VC: That's a really, really good question. I will add that we're backed by Sanofi, but we're also backed by Microsoft. We're one of the rare biotechs to receive a balance sheet investment from Microsoft. And I think my answer to your question lies in balancing the best of both of those playbooks.

I think pharma has been incredible at missing the boat on innovation because they can just buy the boat. And biotech VCs [venture capitalists] have been incredible at creating boats and generating returns, but not really getting them to sail, if you will. On the other hand, technology businesses, whether it's Microsoft that had a start in the last millennium, or it's Facebook and now OpenAI, seem to have this creed of wanting to be generational and touch every life.

So at Enveda, we want to be the latter, but because we don't make revenue the way that you do with the SaaS [software as a service – software accessed online via a subscription] business, actually use the playbook of the former. So, what does this look like? We want to be a trillion-dollar company that has multiple blockbusters, which, by the way, to be a trillion-dollar company, you only need to have four drugs. So, once you frame it that way, it doesn't seem that out of reach if you've created a system for it.

How do you get there? We think of it essentially in three stages. The first stage is get meaningful assets to positive clinical data where you can graduate from being a venture-scale startup [a company aiming for very large growth and returns suitable for venture-capital investors] that's always on the brink of death to being a multi-billion-dollar company that has a meaningfully lower cost of capital [how expensive it is for a company to raise money from investors or lenders]. And I think over the next six quarters, we have a dozen clinical catalysts over four programmes that have multibillion-dollar sales potential. So, we're very close to stage one.

Once you get to stage one, the key is to strike partnerships that allow you to actually have a seat at the table and see what that next phase of that shipyard is. Our goal would be to find one partner for one of our assets, if not two, and actually learn what it takes to do late-stage development and launch by sharing the burden and sharing the profits.



Once we do that and say, you know, we launch one medicine in one therapeutic area in the United States, we've built the muscle and we now have the capital and the leverage to do stage three, which is global and multi-disease area.

So, that's our goal over the next, say, 10 years.

TS: We were introduced to each other through one of our Scottish Mortgage's other portfolio companies, Recursion Pharmaceuticals, as you mentioned before. And its co-founder and chief executive, Chris Gibson, was actually on season one of the podcast.

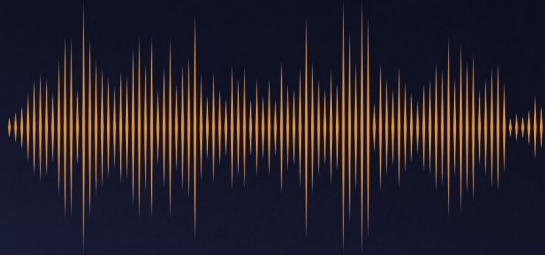
Chris wrote when you left to start up Enveda, I think this is in his blog, I couldn't imagine a better way to lose a great employee. Rock on, Viswa, we'll be here watching and cheering for you. That's a pretty nice endorsement. So, he wrote warmly on your departure. Have you stayed in touch? Do you still trade ideas? And what's Recursion's journey taught you about scaling an AI-first biotech business?

VC: Absolutely. Chris remains a close friend and mentor, even if sometimes we don't end up texting each other for several months as we both traverse our own journey. I think Recursion, first and foremost, gets credit for creating the sector.

And showing the path towards what metrics may be important, what a new way of thinking about success in drug discovery may look like, where investment in foundation models [very large AI models trained on broad data that can be adapted to many different tasks] and open-ended research first is a necessary component to creating value, if you will. I think my time at Recursion and since has taught me three really important lessons.

First, is that the industry is an inefficient idea marketplace. When I was at Recursion, we had the contagious habit of asking why till nobody could give us a good answer, and we realised that almost everything was either, you know, dogma described as best practice or just dogma that was dogma and was accepted. So, that was a very interesting thing because it always means there's a groundswell of potentially path-breaking ideas anyone could choose to run with.

The second was that if you're a drug company, you must have drugs. And I think massive credit to Recursion for initially testing the bounds of where value could accrue and be underwritten [how investors justify and quantify what a business should be worth].



And the third is that, you know, all ideas, teams, theses and technology must be judged against that one yardstick. What reason do you have to believe that you will work better in the clinic than the status quo?

TS: So, looking back to 2019, that $55,000 investment, leaving Recursion, starting from scratch, what's the single thing you're most proud of having built or achieved?

VC: I'd actually cheat and give you two answers, but I think they're related.

The first is that we have built an incredible group of people that are all extremely bold, and the environment for them to continue to express their boldness. So today, Enveda has received multiple awards for our culture. We are consistently rated one of the highest in both anonymous and non-anonymous forums of public discourse for employees.

And I think waking up and building with people you genuinely enjoy being with and having that be the experience of any employee at the company – I think we've preserved that from three people to 330 people, and that's the thing that I'm perhaps really, really proud of. Especially, because the thing that Enveda has achieved is somehow we've managed to be bold, and do things differently, get capitalised and hopefully very soon get rewarded and reward our investors for boldness.

There are many things, to give you a concrete example, about our lead drug that would have never passed committee in large pharma companies. And looking back, by definition, going back to ending with the Bezosism, I think Jeff Bezos told Congress outlier returns, by definition, come from unexpected places. And the thing that I'm proud of is incredible people looking in unexpected places.

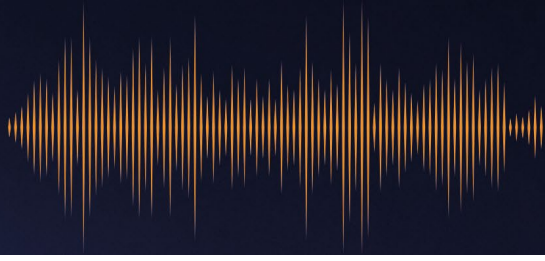
TS: I love it. Now, we always finish with the same final question. What does the world look like if Enveda succeeds?

VC: I think the world will have the first globally loved pharma company.

TS: Great. Well, Viswa, thank you. It has been inspiring to see how the courage and curiosity, which are two traits we prize deeply at Scottish Mortgage, can still help redefine entire industries. So, thank you so much for joining us.

VC: Thank you for having me. The pleasure and privilege is all mine.

CS: So, what a fantastic conversation to start season four with. We always finish the show with Scottish Mortgage's view on the portfolio company's competitive



advantage and edge, the opportunity that we see ahead, and how it fits into the wider landscape. So Tom, Enveda's approach to drug discovery is genuinely unique, you know, using AI to unlock nature's chemistry in a way that simply wasn't possible before. You met Viswa on a research trip when you were in the US, so I'm really keen to understand: what were your impressions of Viswa in those early meetings?

TS: Well, I think you're right. I think unlocking chemistry, there's a set of insights which people haven't really gone after in this way before. And so, what I saw in Viswa was somebody really tenacious, really driven, but with a different skill set and a different way of going after the problem. And also, you know, he'd been at Recursion, he'd seen the first wave of companies and the approaches they'd used, and was able to take those learnings and do something slightly different at Enveda, which to me seemed really promising.

CS: And Tom, I looked at your notes from one of your first meetings with Viswa, and he had this great analogy when he talked about finding "needles in the haystack", you know, the compounds that could become drugs. But he said the challenge was the size of the haystack, you know, and he said that traditional pharma had almost shied away from hunting for these natural products because it's been too slow and too expensive. So I guess the question is, I mean, in your opinion, what makes Enveda's technology different? What's its edge, and why can they overcome those historical barriers, if you like?

TS: Part of it is timing, that the tool set has become available to actually address that challenge. Now, come available sounds slightly passive. What I'm talking about here is that they're able to take the tools of modern IT and actually customise them for the particular challenge here. And the insight that they had is that actually this idea space in natural compounds just hadn't really been fully exploited, despite the fact that it has been so productive for this huge set of compounds that benefit human health. And so, if you could just attack that problem in a different way, and as you say, explore that, the haystack if you like, in an efficient way, then there were lots of opportunities that were bound to have been left on the table.

CS: And then just following on from that, one of the phrases that stood out for me during your conversation was Viswa's phrase about "not electrocuting the horse, but inventing the car". You know, this trade-off between optimisation and innovation, between improving an old system versus sort of creating a fundamentally new one. And I think it's safe to say that he is, I guess, reimagining

drug discovery from first principles. So I guess, do you see a platform like Enveda's using or combining data and AI and new measurement tools as a start of a kind of broader shift in how medicines are going to be discovered?

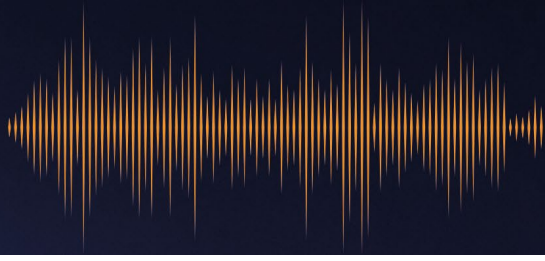
TS: I think the starting point is that you're using natural compounds, and there's a huge failure rate of drugs in the clinic, and a significant part of that is because of their safety profile. But actually, natural compounds look to have a much better safety profile than engineered ones. So, I think you're looking in a space which is likely to increase the odds of success through that trial process. But on the discovery side, it's been able to iterate really quickly.

It's not having PhD scientists at lab benches go one compound at a time for months at a time, but actually starting with a really wide filter, getting through a lot of compounds, and then using the tools of modern technology to narrow that window. But what they've also shown is that they can then take those candidates and move them through the process of turning them into drugs more quickly as well. I think the question then becomes: do you become a clinical-stage company?

Do you take these drugs into the clinic? Do you take them through stage one trial, stage two, stage three [increasingly large phases of human testing to check safety, dosing and effectiveness], and start prescribing them to patients? Or do you sell them to companies that are more established and have the ability to do that? And I think what we'll see with Enveda is probably a bit of both. In the first instance, where companies with the structure have struggled is in funding themselves. Now, what I think is a particular skill of Viswa's is a really commercial attitude to this. Let's take these compounds through, create value, realise that value, and reinvest it back into the system to get the flywheel moving.

And then as the company gains scale, as it gains resources, then you can think about bringing these drugs through that clinical pipeline. But that bit, they can't accelerate with technology, because it's very heavily regulated. They don't want to be taking the compounds into patients that aren't safe, and we wouldn't want them to. So, you're trying to reduce the dropout through that phase, and you try and get the compounds into that process as quickly as possible and as cheaply as possible.

CS: So then, Tom, just picking up on that, I mean, we have to think about the risks and the challenges for all of the investments that we make. And when Viswa discussed Enveda, he talked about having, I think it was a dozen or so potential therapies in development, giving it multiple kinds of shots on goal, if you like. But



he was also very candid about the fundamental challenges in pharma, that things that work in the lab don't often work in people. And even with better chemistry, there's still going to be significant risks.

So, I mean, you've touched on some things there, but in your opinion, what is the biggest threat that Enveda faces and how well placed are they to overcome those challenges and risks, if you like?

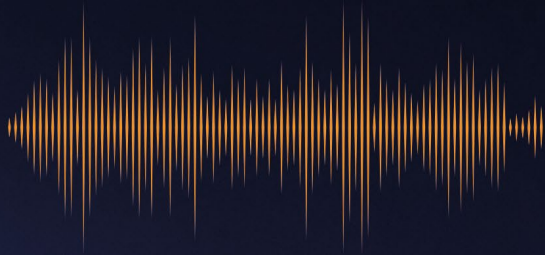
TS: Well, to me, it's one of the ironies of the biotech sector that the biggest risks have nothing to do with science. The biggest risk is funding, because if you're a drug developer and you're not a drug seller, then all you have is costs. And so, how are you going to ensure that you have the capital resources to take those drugs through the pipeline? And as you said, there's inherent risk in drug discovery. Some of those things just won't work.

We know that at the outset. So how are you going to absorb those inevitable failures and still have that capital profile that allows you to eventually succeed? So, I think capital is the biggest risk. And I think we can play a role there as a long-term supportive partner. Then you have scientific risk. And I think what's important to managing that is having several candidates. Not having all of your hopes pinned on a single molecule, but actually having a portfolio and being able to prioritise that based on the best science.

CS: Tom, just a final question. Viswa laid out his ambition, which was Enveda becoming this trillion-dollar company with multiple blockbusters. I think he even used the phrase becoming the first globally loved pharma company. He said you only need four drugs to get there, which doesn't sound impossible if Enveda's system, I think he said, generates 10 times more drug candidates per dollar than the industry average. So, I guess to finish off, Tom, how do you think about the scale of Enveda's opportunity, and what does success look like in the next decade for them?

TS: Well, that analysis, that they only need four drugs to get to this huge scale, I think reflects what you actually see today in some of these big pharmaceutical companies, that there is a power law distribution [a pattern where a few winners are extremely big while most others are much smaller] of successive drugs, which means that the biggest are far, far larger than the average drugs.

So, if he is to realise that vision, then they're going to have to discover some drugs which are both highly valuable and applicable to huge populations of patients. Now, the good news, if you like, is this is a huge industry. It is absolutely possible to



get there. And I think for me, what stopped us from having a trillion-dollar drug company hitherto is that success in developing one drug does not imply success in developing the next drug.

And so the hope with Enveda is that, actually, this platform approach that they have increases the odds of success with everything that they do. And so not only do they have this opportunity to go after these huge blockbuster drugs, but that each drug that they look, that they work on, has a higher probability of success. And I think it's the combination of those two things which could get you to that really successful outcome.

CS: Perfect. Thanks, Tom. Well, that feels like a good place to leave it. Thank you for your thoughts and for kicking off season four with such a compelling company.

And huge thanks to our guest, Viswa Colluru**,** for sharing not just his vision for Enveda, but the deeply personal journey that led him to found it. Over the coming episodes, you'll hear from other inspirational leaders about how their companies are disrupting existing industries and creating new ones.

A couple of things to note: we'll be releasing shorter cutdowns of each interview between the full episodes for those times you want a more bite-sized version. And we'll explain any jargon in the transcript, which you can find in the show notes. If you haven't already done so, please subscribe to be first to hear new episodes. And you can learn more about Scottish Mortgage by visiting our website at ScottishMortgage.com.

Thank you for listening to Invest in Progress, and I look forward to joining you again soon.