

URL: <https://ecorner.stanford.edu/videos/building-biotech-to-last-entire-talk/>

Dr. Trevor Martin is the CEO and co-founder of Mammoth Biosciences, which addresses challenges across healthcare, agriculture, environmental monitoring, biodefense, and more through discovery of novel CRISPR systems to power the next generation of CRISPR-based synthetic biology products. Ursheet Parikh is a partner at the venture capital firm Mayfield, where he co-leads the Human and Planetary Health investment practice, which includes an investment in Mammoth. In this conversation with Stanford adjunct lecturer Ravi Belani, Martin and Parikh share their advice for building a platform biotech company with staying power.



## Transcript

Woman Who you are defines how you build. 00:00:09,510 - Welcome YouTube and the Stanford community. 00:00:11,310 So great to have all of you here. Whether you're in the Stanford community or in our YouTube community, it's great to see you virtually. I am Ravi Belani, a lecturer in the management Science and engineering department at Stanford, and the director of Alchemist and Accelerator for Enterprise Startups. As you know by now, the Entrepreneurial Thought Leader Seminar is brought to you by STDP, the Stanford Engineering Entrepreneurship Center, and BASES, the Business Association of Stanford Entrepreneurial Students. Today, it is a special day because we have one of our alums and one of the great supporters of the Stanford community. We're thrilled and delighted to welcome both Trevor Martin and Ursheet Parikh to ETL. Dr. Trevor Martin, I should say, is the CEO and co-founder of Mammoth Biosciences, which is building the most diverse toolbox for using CRISPR technology.

For those that aren't familiar with CRISPR, CRISPR allows you to exquisitely edit DNA with a sensitivity and a precision that's really unprecedented. It's a new technology. The Nobel Prize, which was awarded for the research on the potential of CRISPR was given for research that was really just done 10 years ago. But it is one of these technologies that's widely viewed as one of these non-linear disruptive moments in scientific innovation that's gonna usher in a ton of profound, deep and broad innovations to come. Mammoth is building an application development platform for CRISPR. As the name suggests, their goals aren't modest. Mammoth is addressing challenges across healthcare, agriculture, environmental monitoring, biodefense, and more through the discovery of novel CRISPR systems to power the next generation of CRISPR based synthetic biology products. Mammoth's areas of focus include a new novel class of affordable, effective, and rapid CRISPR enabled molecular diagnostics that allow individuals worldwide to better understand their health and a novel family of CRISPR proteins that can enable in vivo genome editing. Trevor is the CEO and co-founder, and Trevor is a southern boy having grown up in Georgia. With the love of math and physics, he fell in love with biology at Princeton where he got his bachelor's degree in 2011 and then went on to the farm to Stanford here where he got his PhD in bio in 2016 and he was part of the Frazer Lab in the bio department.

His scientific work has been featured in outlets including "Five-Thirty-Eight" and "The Atlantic". He's the featured healthcare honoree on the Forbes 30 under 30 list, but I think now he's a Forbes 40 under 40. He's also on the Fortune's 40

under 40 list. Are you 31 now, Trevor? How old are you? - 33. 00:02:56,400 - And he's also an ENY entrepreneur of the Year for 2021. 00:02:58,203 So please virtually welcome Trevor. We also have with us Ursheet. Ursheet is a partner at the venture capital firm Mayfield, who led Mayfield's investment into Mammoth. Ursheet is one of those rare VCs that straddle worlds that other VCs are too scared to. So Ursheet co-leads the human and planetary health investment practice and invests in cloud infrastructure and cybersecurity, and prior to Mayfield, Ursheet had a career as a proven repeat entrepreneur and executive at Cisco and Microsoft.

He was the co-founder and CEO of Store Simple, which is a leading cloud integrated storage company that was acquired by Microsoft in 2012. And Ursheet is another example of how the US has been the beneficiary of amazing talent reared in India. He holds a bachelor's degree in computer science from IIT Mumbai, the Indian Institute of Technology in Mumbai where he received the Young Alumni Achievement Award in 2015, and he also holds an MBA from the Wharton School and is passionate about accelerating healthcare innovation and transforming college education. So everybody, please give a virtual welcome to Trevor and Ursheet. Trevor and Ursheet, welcome. - Thanks. 00:04:06,201 - Trevor, I just wanted to open the floor to you 00:04:09,410 if there is anything you wanna add or share with the community that about Mammoth or any other messages that you wanna relay before we go into the directed fireside chat. - Sure, yeah, no, it's a great introduction. 00:04:20,580 Thanks. Definitely comprehensive.

So yeah, the only thing I would add, just to kind of put context around it is to your point, like CRISPR kind of came on the scene, let's say, like 10 years ago, some of the seminal papers that came out of our co-founder, Jennifer Galden's lab, for example. And at Mammoth, I think what's exciting is we're able to build on all this kind of foundational work that's been done using what we call the legacy CRISPR technologies, things like CAS9 or CAS12. And the point of Mammoth is to build out this new portfolio of new systems, new technologies to really deliver on what we see as the promise of CRISPR. And it goes to, you know, the things you mentioned, where one of the things that makes Mammoth unique is that we see that promise broadly across both detecting and curing disease, and within each of those areas we have kind of a north star. So on the curing disease side, it's all about permanent cures for genetic disease. And this idea of what if you could get a one time injection that would actually mean that you never get, never need to get treated for that disease for the rest of your life. That would obviously be transformative for patients lives. And then on the diagnostic side is this idea that we've been able to develop this, the world's first new method of molecular detection, I don't know how many years, basically, leveraging this CRISPR technology with the kind of sensitivity and specificity of PCR or sequencing, but with this very simple chemistry, that means that it can be pushed in a decentralized manner and closer and closer to the patient, whether that's the doctor's office or the home. And what's exciting is that it is this kind of platform technology. So I mean you listed out some of the areas, right? There's like, you know, therapeutics, diagnostics, bio-manufacturing, agriculture, all sorts of areas, and that's the kind of the blessing and the curse of a platform technology, is that there are these like so many exciting things we can do.

So you have to think really critically about like where do we go? Where do we go with partners? How do we enable others? How do we like protect things for ourselves to preserve value? And yeah, I think we'll get into many of those things today. - Yeah, I wanna jump into that. 00:06:19,420 So that's fantastic. Ursheet, do you want, before I dive into what Trevor's saying, can you educate those that aren't familiar with biotech investing, why Mammoth, what happens with a typical biotech startup and why Mammoth is different if Trevor already didn't already, you know, capture that? - Sure. 00:06:42,390 So you know, if you kind of look at the arc of the innovation ecosystem, in the seventies and eighties, right., investment in tech and life sciences was very similar. You know, investing meant in tech often meant doing hardware, software, a lot of engineering that kind of then had to be brought into products that came to market. And you scale up revenues and then you, you know, went public or took exit. And that often took seven to 10 years, and that was also the case with what was happening in life sciences. Then in the late eighties, early nineties with the advent of the internet, it became pretty easy to write software, you know, move electrons on the PC, more electrons across the internet, and it started transforming returns for sort of venture capital firms on the tech side of the house. And so a lot of life science investing ended up becoming a very specialist thing where firms then focused on sort of creating assets for other large pharma companies to buy.

And a lot of biotech investing often works like that. So there's a lot of firms in life sciences investing that will basically be a portfolio of 20 or 30 kinda individual sort of treatment investments. And the goal in those is less to build a standalone company and more to focus on creating enough data to make it credible such that a large company goes and acquires that. Now CRISPR, as it happened in 2012, the first few companies that started out with CRISPR sort of did take a mainframe approach to innovating with CRISPR. Their view was, so CRISPR at the core is a fundamental bioengineering technology. We look at it like the Intel or Microsoft of bioengineering. And so in the classic tech parlance, when you have a platform technology, you have to build some applications to show the part of the platform, but then you have to get an recruit, an ecosystem that can build all the applications to kind of truly realize the value of the platform. And so the first few companies that started out in 2012 took the first CRISPR protein and instead basically, you know, kept on fighting among each other on who owned it but focused on doing everything on their own, kind of like, almost like the way the mainframe land people built their hardware, you know, their chips, their operating systems before they built the application. With Mammoth, the view was that we had the core engine that was finding CRISPR systems and the odds that, you know, the first was the best and the only one was pretty low. So the fact that this approach could then, you know, powered with high throughput screening AI and a lot of biology could find new CRISPR systems for different applications was something that became core to the company, and then it was sort of used to bring new applications like diagnostics which nobody had done before in addition to therapeutics and biomanufacturing.

And so the core then as a company is your culture is very different. You do have a mission to market. So the core mission at Mammoth that aligned everyone was we wanna impact and save as many lives as quickly as possible. Which meant that even though diagnostics doesn't look very profitable from a return on investment perspective, we were not gonna go do it. We were gonna go ahead and do that and we were gonna go ahead and do things, but we were also gonna go ahead and partner along on that journey. And in that sense, then it meant that you had to sort of think about, you know, a true build to last mindset. You had to think about what is the business model product. Often in biotech companies, you know, scientists will think about revenue as bad. Here it was the other way around, right, which is if we had to be in business to build up the company, we had to sort of go ahead and start thinking about revenue early on. And Mammoth is one of those companies which actually has done really well with revenue (speaking faintly).

So this starts giving you a flavor of sort of how, you know, this designed from the ground up. You also wanna have aligned stakeholders, right, because you don't want an investor looking for a three to five year exit when you try and build a 10 year company. So there's a range of things like that go into it. And if we don't get the foundation right, it's impossible to retrofit. - So much good stuff. 00:10:26,580 So I wanna really dive in to get really practicalities for all the founders that wanna go long like Mammoth. So really thinking big and thinking about practical tactics on how do you actually orchestrate a startup if the goal is to build this long term platform. And I think many of these learnings are gonna be also relevant even if you're not in bio for all the other founders. Because I think a classic thing is to think about where to start. And when you're building a platform, you're oftentimes cascading focus areas that will ultimately become the platform, but you need to decide where you're starting initially.

And as Ursheet alluded to, and also Trevor mentioned, there are this, there is sort of a bifocal model here, but one of the early markets is diagnostics. And I wanna use this as a case study because it's a counterintuitive market to go into. And what I'd like to do is, the intention here is that founders oftentimes grapple with which market to focus on first. And you can use a bunch of dimensions, you can look at market size, you can look at willingness to pay, you can look at tech differentiation and I wanna abstract from you guys the general learnings that might also be relevant for everybody. So given that, can you first explain why diagnostics for those that aren't familiar with bio causes an allergic reaction to many VCs when they hear that that's what you're doing, and then two, the process by which you decided which market to focus in on early and if there was a framework that is extensible for others. Either of you can take-- - Yeah, okay. 00:11:56,460 Yeah, I can start it off. So I guess going to the first part of your question around prioritizing the market, I think it is really important cuz that is like, the blessing, the curse of a platform company is like you can do everything but obviously like you'll fail if you,. And that's like a classic like, and I don't know, I've probably had to learn myself like a seed kind of issue, is that you have this like big vision of like, oh, it's like a platform and like it can do anything. But if you don't have like a good story around like what are some specific markets that like it's really compelling for it and that can be really challenging to like have a compelling story about like okay, like why is this exciting and investible? And I think just to start off, I think people maybe over-index a little bit on like, oh, like when you're doing your seed round, like this market that you set in the deck is like the exact market you're gonna go after like 10 years from now.

I think what was more helpful to me at every stage of the company was the thought process that you went into when you're selecting that. And you might pivot the exact market as you develop the technology and you move along, but what's important is you have that thought process of like going to market and like understanding like okay, like what are the advantages we have? Like where can we not go cause maybe we don't actually outcompete. So it's more of like a philosophy of like, in some sense, it matters less what you choose and it's more that you have a mentality of choosing and like iterating on that and like making sure that you're always thinking about okay like I have a cool technology platform but like where is it headed and like having that product mindset. That can be like a really big trap, I think, is just like staying on the technology and then just assuming that like oh, people partner, like you know. So I think that's the high level. So then once you do that, like you can stack rank things however you want. There's like market size, there's like time to market. I think something that's underappreciated there is this idea of kind of the proof points, like regardless of market size even, is like maybe something you wanna optimize for is just progress and like showing that the technology works. And maybe you do that with a market that's frankly like not commercializable in many ways. And you know, hopefully it is and like you work something out, but maybe you're actually just optimizing for, hey, this CRISPR works and it is something that's efficacious and it like is safe in humans.

And even if that's on some tiny disease that maybe wouldn't be very commercially profitable, that could be huge in terms of like funding the company for the long term and like getting partners excited about targets you do care about. And for technical reasons that small market might be way easier to achieve those technical milestones with. So I don't like people sometimes see that as like a dirty word like, oh, like it's not the right market size or something, but I think that's something I've definitely come to appreciate is that there's many other factors that, just because it's not like business school, like, oh, like the right market or something doesn't mean that it's not the right thing to go after. And you have to just really understand like the market dynamics of like the industry you're in, what are investors looking for? If you're trying to build a long term company, you're gonna need to raise a lot of money. So you need to understand like who your customer, what your customers want and one of your huge customers are receipts, cuz otherwise like, yeah, you might have chosen the right huge market but you just die cuz you don't reach the right proof points, and you know, unfortunately the technology doesn't reach its full potential. So I dunno, those are just some initial thoughts that I have. - So, so Ravi, if I could add right, 00:15:07,410 both in terms of the answer to that question as well as along the points that what Trevor mentioned, what I think Mammoth and

Trevor, under Trevor's leadership to date, right? So I think the first is you can do like one of, this key point is you can do a platform company but that can mean anything to anything. You can do 10 things but you ought to do it them one at a time. And so it's very important. And so culturally the company has a very strong sort of mindset on goals and accountability and what is the focus for a given quarter, and if somebody is going to change from that plan, right, having a, you know, just being very, you know, driven about it, right? They're on OKRs and it's not that everyone scores 100%, it kind of scores at like 70, 80%, you have to be intellectually honest.

Often when you have very strong sort of academic mindset, people are not used to sort of going ahead and acknowledging that something was 70%. But in a startup you have to have stretch stuff. So if everything's a hundred percent you're probably not aiming kinda high enough. - And for those that don't know OKRs or goals basically 00:16:03,900 setting goals, objectives and key results. - So one is that, and then to the specific question about, 00:16:09,120 when you're trying to build a company for the long haul, you are trying to manage risk. So when you have a big technology or a step change technology, you wanna prove it out with different steps along the way. And sometimes what happens is when people are thinking. I want to just like, you know, there's the hen that lays the golden egg, I just want the hen, I want the big market, you can take on too much technical risk, and that can be the undoing of the company, versus some of the things that Trevor and team are really mindful about is how do you kind of go and break these big problems into smaller things, focus on what you do very well as a core. How do you find partners to do a bunch of the other stuff? Do the stepwise building block to show. And then when moments come they show agility, right? Like during COVID, it became one of the first like, in 40 years, it was like since PCR, CRISPR diagnostics is the biggest advance in diagnostics, and it went from concept to, you know, FDA e-waste faster than pretty much, you know, along the same suite as the mRNA vaccines kind of thing.

And so then, you know, but they were conscious about if they were gonna go prioritize that, what were they not going to do and why they were gonna go do things, or if they pick narrow disease areas, how do they prove the platform out? How do they prove their differentiators out? So that's a lot of that kind of stuff that is at the core to the strategy. There's one of the questions in the chat on how is like doing a software company different from a deep tech company like this. Software is very easy to iterate and pivot, and these things, any moving atoms in businesses, especially if they're regulated, is often much harder. And so you have to be more deliberate and more thoughtful about what you're going to go spend on. Like the planning phase is very, very important. And often there's a tendency that, Hey, we got the money. These days, it feels that in the Stanford ecosystems, it's easier to get money to start a company than to actually go through an interview for a job where somebody will have, you know, ask you like 15 different interview questions and things like that. But then once the money is there, what do you do with it? That planning phase and strategy phase is very, very important for anything which is a moving items business because you wanna kind of from an investor perspective, prove out the product, the business model, and a lot of the other things like proving out the business model actually can happen much faster than actually building the product and will cost a lot less, and will make you much more attractive to investors. - I just wanna unpack this because there's a lot 00:18:25,350 and I think this really, gets to the heart of where the rubber hits the road for most founders, is a couple key takeaway games for choosing the market. The first, as Trevor said, is make a choice.

So one of the pitfalls is doing too much. - The only wrong choice is not choosing in many ways. 00:18:40,950 - Yeah, the worst decision is indecision, gang. 00:18:42,210 So choose. And then what should guide the decision is not necessarily market size because it's, It sounds like in Mammoth's case, a lot of the decision was driven by your technical differentiation. And these guys glossed over the points that I just wanna make sure that you understand, is just that with CRISPR, there's the key technical differentiation on diagnostic, is there's high sensitivity and it's really cheap, you know, relative to what's already happened before in the past. And so then they mapped that to a market to go after, which is diagnostics. And diagnostics may seem like a small market that, for a variety of reasons, doesn't make money for investors, but it's a false notion because with CRISPR it actually expands what the market size potential can be. So the focus on proving out and developing the technology is what allows you to layer the tech development towards the platform and you're simultaneously expanding the market to a new market that is historically misguided if you're looking in your rear view mirror on market size. Is that fair to say? Was there any other tactical or unintuitive insights, Trevor, on the framework you used to decide on the initial focus area? - Well I think there's a lot that you have to think there 00:19:56,970 in terms of like company narrative as well.

So from the very beginning of the company, we've been working on both therapeutics and diagnostics. I think for most of the company's lifetime we've, you know, been known mostly for our diagnostics, but that's not because we haven't had the ambition to build therapies or like been working on it, it's more you have to understand like what are the key proof points that like, you know, make that something that you wanna share with the world, and like how do you wanna like sequence that timing And obviously the pandemic really highlighted diagnostics in ways that, you know, the last century hasn't had the opportunities for, and it was a really great opportunity for us to like step up to the plate and get the world's first high throughput emergencies authorization for a CRISPR based COVID test. So it's just a testament to the power of the technology. But in general I think they, you know, most companies would've just said, oh okay, like we'll just talk about, you know, therapeutics from the beginning. But to Ursheet's point, I think that what's interesting is if you're thinking about other things aside from just like market sizing, which diagnostics whenever compare to therapeutics in terms of market sizing, but you're thinking about like time to market and what's the places where you can really move quickly and like really, you know, be able to generate even revenues like substantially sooner than like therapeutics, for example? That's where you can start to think more creatively, and you can say, oh okay, like actually having therapeutics and diagnostics together is extremely exciting for a variety of reasons, A, cuz it leverages the same technology, but B, it's actually kind of uncorrelated business

models in a way of like, diagnostics is regular recurring revenue, like quarter over quarter, whereas therapeutics is, you know, nothing for many years and then you kind of have a zero to one event and billions of dollars of revenue. So something that's interesting in like a down market, for example, or a dislocated like market we're in is that for therapeutics only companies, because they're kind of driven by these data readouts on the path to their hopeful approval, you'll see actually on even good data readouts, their stock will go down cuz people sell into it because they know there's six months before the next readout and there's not gonna be any news in between and they can just rotate in and out of it as they please on that journey. Whereas if you have multiple uncorrelated business models, not just therapeutics, diagnostics, but like agriculture, manufacturing. That means that you actually have all this news flow, and you know, you really have to be along for the ride and a long term investor or else you're just gonna miss the boat and you can't kind of rotate in and out like, oh, like I know their next clinical readouts in like six months. And you can see how that starts to snowball into like actually building a generational biotech company, right, and not just building something like maybe that's, you know, snapped off on a clinical readout. But it's like way more capital intensive.

It requires, you know, way more stomach, it requires, you know, just like a lot more kind of thinking around how you're structuring the company for the long term. But yeah, I think that's, it's just depending on how you're trying to build out the company itself. - And if I could add one thing here, right, 00:22:51,390 it's also within a sector you have to pick the right sort of sector. It's like, so for example, there was this question on diagnostics. So if you look at the diagnostics value chain, the testing companies like your LabCorp or Quest or like a Stanford lab is not a very venture return business model. The individual tests themselves, it's not that big, right? Like the biggest exits that have happened around that have been like 10 billion kind of companies like Rail. But if you look at the picks and shovels that power the whole diagnostics ecosystem, this where you have companies like Thermo Fisher, Illumina, that's like close to half a trillion dollars of market cap that is sitting in becoming the picks and shovels. And so when you are kind of one of those more fundamental technologies, yes you have to kind of go ahead and create a test, which is in the second category to show it works, but then you can power a whole ecosystem. And with CRISPR diagnostics, it would be true molecular sort of RNA/DNA detection happening at point of care, at home, with just unprecedented specificity. And so the point is that yes, you're doing this test but it's really a proof point on the platform and then you are going ahead and enabling others sort of go build out, build out with that platform.

So it's also important to articulate that story well because a lot of investors will often have add, you know, they may just zero in on this one thing and not gonna get the whole thing. And anyway, so that kinda,, is a full-time job, right? I think a deep tech company really needs a CEO who has to sort of really focus on storytelling, strategy, fundraising, you know, big deals and kind of exec recruiting, right? They, if they are focused on their science and building the product then they're not being the CEO for the company. And to Trevor, his kind of credit, right, he took that leap despite his PhD, despite his technical background and then surrounded himself with a lot of amazing advisors to actually become really good at the CEO job. You know, you can't sort of be a part-time CEO if you're gonna build a world changing company. And so he did then go see sort out amazing co-founders who are the best people in each of those technical areas to kind of be his founders. You know, one of them later ended up winning the Nobel Prize a few years later. So those were sort of these kind of things that I felt that, you know, these are the things that Trevor and team do really well and--- - So let's dive into that because we had this discussion 00:25:12,000 on near term, the short term lens on the market opportunity and then the one point that Ursheet brought up at the beginning was that you also have to set it up for long term success at the beginning, and we're already covering some of those topics. But I wanna, you know, invite Trevor and Ursheet to comment about how do you make sure there's alignment between investors and founders from the beginning to prevent mistakes that can stand in the way of realizing the company's mission. Especially because oftentimes, we're seeing long-term missions that will get compromised by short-term optimizations or ethics are compromised in the process of achieving your long-term goals. And especially with Mammoth, there are significant ethical repercussions of how the technology can be used for good or bad.

Trevor, Ursheet, can you comment on how investors and founders can be aligned or considerations at the beginning to align for long term success? - Yeah, I can kick off. 00:26:06,240 Yeah, I mean just like, you know when, I'm sure, when, well Mayfield, especially when Ursheet, when they're looking at, you know, founders, they're looking at people, right? The founders should be doing the same the other direction. Like cuz it is a long journey, right? It's like hopefully like a 10 plus year timeline. So whatever you're talking about at that time, like the tactical part is probably gonna be completely different like even maybe a year leader. So like you, you wanna make sure, you know, you are having a good conversation, but the more to the point I think what I always look for is the conversation itself and like, do you like talking to each other? And like even if you disagree, like does it feel like you're learning and like you're moving forward, and like fundamentally just do you like respect each other mutually? Because there's gonna be times you agree, there's gonna be times you're like, you disagree. If you just always agree, that's probably not a good sign either, right, because like clearly like you never disagree on everything. So I think it's more like looking for someone that can be like a true thought partner, and that as the company's growing, like you can both really, yeah, just like be really in sync in terms of how do-- - so all the VCs are gonna say that we're here to change 00:27:12,720 the world and we wanna be your best friend to come to when you have a discussion. It's a common narrative. So if you have multiple, how do you actually know who's actually-- - You just spend time in my opinion. 00:27:22,470 And honestly that's one of the biggest skills you have to develop as a founder, I think, is that intuition.

Whether you're hiring or you're like finding investors, being able to like see if you have values alignment, right? Cause if you hire someone and you don't have values alignment either, like you're gonna end up in similar problems. - But once you sign the term sheet, 00:27:38,040 you're sort of wedded. You can't get rid of the investor. So how do you know if your values--

- (speaking faintly) are non-binding, 00:27:43,410 but yeah, the definitive. - Okay, so, fair enough. 00:27:46,232 But how do you know if your values are aligned if it takes time to figure that out? - Yeah, so there's the conversations, 00:27:51,750 but then I think other things that are really helpful is just looking at like other entrepreneurs they've worked with and like what are the types of companies they invest in, and like, you know, that speaks for itself, and it doesn't even have to be the same industry. but it's just like, are they building things that tend to, you know, get sold in a couple years? Are they building things that are IPOing, and like, you know, really trying to build something that's generational and gonna change the world. And you know, talking to entrepreneurs that have worked with investors very similar to how, you know, you get diligence to yourself as a founder. So I mean all those things that are just going into that funnel of like, is this person someone that I'm like values align with, and whether we agree or disagree on any one tactic, like are we both shooting for the same goal? - Ursheet, do you wanna comment, 00:28:32,280 cause I know obviously you're the chair or the co-lead of the human and planetary health investment practice at Mayfield, so I'm assuming you're investing, everything is long term mission driven. Any comments about how investors and founders get aligned for long term impact? - Yeah, so I'll talk about sort of, 00:28:47,820 I'll say two sides of the coin, right? How do we as investors look for that, test for that, and then what were sort of some of the things that, you know, very specifically that Trevor did, right, that sort of goes ahead and build trust, right? Plus, for these any relationship to work well, there's a lot of, there's gotta be trust and mutual respect.

Now, the way, you know, I approach a lot of the deep tech companies when founders are first time founders, it's almost our job is like hopefully the founders are elite athletes, and you know, we are like a great coach and together we can help sort win the championship. So that cannot happen when we are just being cheerleaders. But that also requires us to first earn the trust of the founders and then customize any feedback that we give to, you know, the game that the founder is playing and then, you know, the founder themselves. And that does require a good amount of time. It's hard. And that then also means that, you know, if we are gonna spend so much time with a company, we can't sort of go ahead and then take a very small stake. So the most common mistake that I see a lot of deep tech founding teams do is try and do what I would say is a party round at inception. You know, I'll borrow a phrase that Trevor uses when he is recruiting. It's called give-a-shake factor. Like how, you know, and it's like when people take option on you, like you do a \$3 million round with like, you know, 10 \$300,000 checks, who's really like, is this meaningful? Are people really going to care? Is this check even worth their time? Is it worth their time to actually come on the board, right, like really coach to build, right? Because that is the cheapest equity in the company.

So besides money, fundamentally, are you really kind of getting somebody who's gonna help you win this game? So that was the one thing that, and Trevor, and so when we had a very tiny seed investment in Mammoth, he made me work harder than pretty much most other people because you know-- - If you could make that specific, 00:30:41,250 what did Trevor ask you to do, just so other founders understand what they can ask. - And so I've kind of come to this, right? 00:30:46,538 So for example, you know, he shared with us this mission and vision of how he thought that while they do the first diagnostic test, it would be a platform kind of like Intel Insight. And so we said, well if it is going to be that mission, then you know, it's a, the space is CRISPR. You have to kind get that great IP strategy. And we said, here are some of the best IP people. And instead of sort of saying, oh, my friend told me XYZ, he actually interviewed and he ended up picking what would've otherwise been Mayfield's IP diligence people out on it. When it came to simple basic stuff like real estate and stuff like that, they didn't even waste time. They just took the team and the support they got out of it. For finance and accounting, right, it just kind of ends up creating a lot of straightforward mutual trust where it's like that's not where like a lot of the value gets created. A lot of the founders get excited about the novelty of running a company.

It's very empowering to kinda have the money and be the founder and CXO of something. But they kept their core focus on that end. You know, he encouraged me to then reach out to Jennifer, which we did, and then that is what then triggered the conversation where I could come back and say, you know, like work with Jennifer to see can she come in as a co-founder, and then Trevor did the work. So after that conversation, Trevor actually then recruited, you know, Jennifer, and then you know, other people coming out of her lab to come in as kind of co-founders, right? So these were all of these things that were happening even before we had done our series. But the cadence of that conversation was several conversations a week at a time. So that kinda gives you the sense on how do you kinda, because one and so and so now let me kind of say what am I looking at as an investor? So a company won't really grow faster than the founder's ability to learn and grow, right? And so that is where, how fast you learn kind of turns out to be, can you trust, can you benchmark excellence in different areas, right? How do you make decisions? How do you kinda learn from your mistakes and move on? How do you manage risk? How do you like, you know, are you really true to the mission, right? There is a lot of this disconnect that you say people will kind of say a mission, but then when a decision comes to test on the mission, are people really true? You know, in the example that I just mentioned, Trevor had to dilute himself over 70% to bring another co-founders, and that decision for him was a matter of hours. He didn't have to wallow on for days. And then he went about going and recruiting the rest of the founding team out to the cause even though the company had raised a bunch of seed money, and the way the, you know, and that sort of things. So these I think kind of give you a little bit of the flavor on is this going to be the kind of relationship where, you know, over time the mission does get realized. - But then can I push on, can I ask about Mayfield and FTX? 00:33:30,788 Because you know, in many ways FTX, and for those that don't know, FTX is the famed crypto company, or it's a, you know, Web 3.0 company that famously imploded because there was a lot of fraud at the high levels.

And Mayfield along with many of the top high, other top high performing funds in Silicon Valley, Sequoia, Lightspeed, NEA, et cetera, it felt like it was a syndicate round or like a party round into FTX, and that, you know, the narrative is that the investors turned a blind eye towards appropriate oversight because they didn't wanna rock the boat, you know? The dangle,

the carrot of huge returns dangling in front of them over overcame what should have been true investor oversight. Can you address that versus, you know, what we're, relative to what we were, what was just said? - So, you know, the Mayfield had is, 00:34:26,880 well, Mayfield had invested in a company called Blockfolio and had invested a seed round, a relatively small amount, less than a million dollars in a company that was acquired by FTX. And that is how Mayfield caught to sort of have, you know, shares in FTX. I think, you know-- - So FTX, just to clear be clear, 00:34:49,140 Mayfield didn't directly invest in FTX. It was just passively, it ended up getting equity. So then maybe this isn't a fair question because, and I don't know if you wanna give, because maybe this relative to other funds, so we can move forward, but was there, is there, there's a broader narrative going on that-- - Yeah, so let me, but I do have an opinion 00:35:05,559 that I can-- (overlapping discussion) So, you know, it's hard to build trust even when people are in the same place, when you are going ahead and building companies across geographies, across distance, right? Like, I'll give an example of the kind of things that we see a lot of the founders too, that, you know, it wasn't clear if there was enough evidence to that on the other side. Because you know, when you think of a company, right, investors kind of give you money, you know, when the investors', businesses, their investors have LPs have given them money and they have to give them, you know, returns on top of that. So when you have that right, just how do you run the finances? Do you I actually encourage companies to start doing audits, you know, relatively early in life for the company, right? So actually, because what it does is you wanna have the, you wanna have the books, you wanna know you like, you know, a lot of the founders may not have all the full sort of underlying, and so we see a lot of founders will go with financial, you know, acting CFOs or accounting firms that we recommend who do the work for them out on that end. Same thing on the legal side of the house. So I would say for anybody that's starting a company, right, like it's a good practice because what you're getting when say I'm making a first for somebody to make into my recommendation list, I have to have seen that work and I have to have known that those are really, really good that have gone ahead and done that over and over again, and we've seen that quality of work and it's one of the areas where it's easier for me as a board member to benchmark excellence because I've seen it across categories, across companies, (speaking faintly).

And to me, you know, some of those basics, as I look at the public reporting, and I don't know anything more than what has been reported publicly on it, but yeah, including like, you know, the Fortune article or the Walks article today, it just feels that some of that basic infrastructure that makes a company was kind of lacking over there. And what had lacked, what happens is leaders, managers, boards don't know what is going on in the company. You don't know what the truth is, you don't know whether you can trust the financial statements that kind of rolled up to you out around that end. And you know, there is a tendency to kind of play fast and loose but I look at those things as core to the infrastructure of a company, even the people processes, HR systems, all of that kind stuff like that. And if there was ever a lesson to sort of go and work through that, I think, it's like there's, it's like penny for a pound foolish to try and cut corners on that kinda stuff. - Well thank you, Ursheet, for answering, 00:37:31,140 and I apologize for the question. It was misguided towards Mayfield and we should have invited the other VCs that were really involved. But I appreciate your generously commenting on the situation. There's lots of questions for the two of you from the Stanford community. Obviously we're not gonna have enough time to get through everything.

I'm gonna kick it off with the most uploaded question, which is for Trevor: How much did doing your PhD help you in this path? Do you think doing a PhD is a good use of time for students interested in startups or is it better just to learn the technical aspects on the way and waste no time and just start a company instead of spending time in academia? - Yeah, that's a good question. 00:38:08,070 That's definitely what I've thought about. So I guess first of all, I think doing a PhD is incredibly helpful for doing a startup, not just on like the technical side and the credentialing, but I think for a good PhD program and a successful PhD, one of the key, well you learned two key things. The first one is resilience because chances are you're just gonna fail, fail, fail, fail. And you know, you just really have to like love what you're doing and like understand, be very mission driven by the goal of whatever research that you're pursuing. I think the second one is that you have to navigate uncertainty. Like unlike, you know, undergrad, or like a master's, there's no textbook, right, there's no like, oh like just you know, get an A on this test and then like you'll graduate. No, like you could do everything right and still fail, right, and that's like part of the resilience aspect as well. So I think those mindsets are actually extremely good for a startup because many of those things are gonna be the case. You don't have a textbook on like, oh this how you build like Ubers, of course not otherwise a hundred people would have done it before you.

And then the second one is that very often you're gonna, you know, run into a wall and you're just gonna have to be resilient, like understand how to pivot around it or to overcome whatever it is. So I think those mindsets are actually quite good. There's many things a PhD does not help you with at all. Like I think, like people management, like, I mean obviously you don't learn any like finance. So I think there's many things that you have to, to Ursheet's point, learn very quickly. But I think you can come in with like an extremely good mindset coming from a PhD. I think that can be a huge asset. That being said, I have to say I don't think you should do a PhD to do a startup. I don't think you'll finish your PhD if that's your goal, to be honest with you. I think if you happen to have done a PhD and you're looking at what's next, a startup is a real opportunity and you should not shut that door on yourself, and like you should really, really think about like is it your life's work to take a technology? And the interesting thing about myself is that it's not the technology I invented even though I have a PhD, but like is there a technology that you believe in so much that you wanna dedicate your life to actually seeing that go out into the world? And if so, yeah, like having a PhD is an amazing platform for that and I think gives you a huge leg up.

But very much I would say, yeah, good luck completing your PhD if you're trying to do it just for a startup. In that case, yeah, just do the startup. Like that's what you care about, right? And you know, you can learn technical things on the job of

course and like, you know, many of the, you're not gonna know everything going into a startup anyway. So don't think about like, oh I have to learn this and then do the startup, right? You'll never do the startup, you'll just stay learning forever because there's just always new things to look at. So anyway, I think people that have done a PhD absolutely should be founding companies and I think they do have huge advantages. But that being said, if you wanna start a company, just start a company. - And Trevor, if I can preempt the question 00:40:56,010 that I think many of the scientists and academics who are thinking about becoming CEOs might ask, if they get comfort in books. Are there books that you would recommend for somebody who is a novice when it comes to being a CEO that were salient for you, for your development? - Yeah, I mean there's a ton, 00:41:11,460 I mean there's like the hard thing about heard things, there's like zero to one, there's like plenty of books and podcasts and many things. But I think those are like nice and like you should read them and like understand them and you don't have to agree with everything. But the way more important thing for me, and Ursheet and Mayfield connected us with some of these people early on, that turned out to be critical and even became like independent board members.

Actually some of our independent board members started as diligence calls during our series A, which not many people would bring them on as independent board members on their diligence call. But they're just amazing people that have like built companies and who understand startups and the journey that you have to go on as a founder, and like having those people around you, that's what's critical, right? Like, it's like trying to learn to ride a bike by, I don't know, reading a bunch of books on how to ride a bike. Like I don't know, you wanna be on the bike and you wanna have people next to you that are like professional cyclists and like are helping you get along. That's like the number one thing. Don't spend too much time on the books. - Terrific, thank you Trevor. 00:42:07,110 Next questions for Trevor. Genetic editing has a ton of promise. Do you have anyone on your team who evaluates the ethical considerations of these therapies? - Oh interesting. 00:42:16,710 Well I hope everyone on the team evaluates the ethical considerations of the therapies.

We don't have a, like a full-time role only on that. I think right now in the CRISPR space, there's two types of editing. There's somatic and germline. No company that I know of in the US does germline editing. So it's kind of the division where, what germline means is that it would be passed down to your children. So like if you are cured of Huntington's disease, then that cure would be passed down to any kids you might have. Whereas somatic, if you're cured of the disease, if you have kids, they have the exact same probability of having that disease as if you were never cured. There's no kind of passing down. So most of the ethical considerations seem to be around the germ line cuz there's these things around, you know, like altering the evolution of humanity. Although, you know, look at the edifices we build around us, those alter our evolution as well.

But I think in general we're focused on somatic, and they're, I think a big ethical question beyond the kind of usual ones around kind of CRISPR babies and things like that is what's the highest need and like where are the areas that you should be prioritizing first because there's like immense need from the patients for transformative therapies. And I think that is like a really important consideration when you're looking at where you should be pointing the technology as well, whether that's therapeutics or diagnostics. - Are there any bioethical standards that you guys 00:43:41,481 have set as a company or exercises that you're going through from the very beginning to think about? Because you know, we had Hama TAHN-EY-JUH, who's also a VC, on and he was talking, he wrote, spoke about how, you know, there can be these unintended long-term consequences that everybody with good intentions wouldn't want to do, but that the company can end up in if you don't think about them from day zero. Are there any exercises like that the company engages in or that are relevant here? - I think the most relevant one is just what's 00:44:11,250 the culture you're building at the company and being very intentional about that, right? Cause it's hard, I haven't read that particular book, but it's hard to probably predict 10 years from now where you're at, right? But hopefully what you can control, and what will help lead you down that path is like how do you, what's your decision making framework more generally as like a company and like what do you value? Like are you to the very beginning of this conversation, right, like are you trying to save as many lives as possible, right? Are you trying to maximize the use of the technology? Are you trying to make healthcare as accessible as possible? Like you can choose your like function and then making sure that you stay true to that, like it can be updated over time. Like the way we think about our values and some great advice I got early on is that you should always use your values as a lens for decision making, and that's how they become real. So like you can have 'em on the wall or whatever, but whenever you're making a big decision, you should be going down each value and saying, okay, if I really believe this, like which direction should I be going? And hopefully those micro decisions and macro decisions lead you to a good place in 10 years, even if you don't know that from the very beginning. - Ursheet, you wanted to comment, we have 30 seconds. 00:45:14,660 Alright, so quick thing is I think the, I do see this, you know, move fast, break things, don't worry about the end product, much more endemic in software driven innovation companies or tech driven innovation companies. I think, you know, companies like Mammoth tend to be way more sort of grounded there. It's much more about being real about like the progress, the problems, that set of things, right? And so the culture is at the core in either of them, and you have to kind of find the balance between innovation and this point.

Pretty much if something is wrong, people in the org have to be able to raise their hand without the fear of any repercussions to kind of get that message out. And so the culture is at the core, right? Because somewhere along the way people will know if something's not going right and people have to feel empowered to be able to kind of go ahead and bring it up without the fear of being shot sort of down by the leadership. (synthetic musical notes)..