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The Challenge of Biology

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08-05-2024

URL: https://ecorner.stanford.edu/clips/the-challenge-of-biology/

Margo Georgiadis, CEO-partner of Flagship Pioneering and co-founder and CEO of Montai Health, explains the challenges of drug discovery and development and what motivated her to find a different approach to the industry. She shares Montai's approach and strategies for using AI.

Transcript

- There's a lot we don't know about biology 00:00:05,460 and still we want to build solutions, and how you deal with this high uncertainty, as you said at the beginning, right? Because we're literally blindfolded.. So I just wanted to get a little bit more of your insights behind the companies that are public or whether we're successful today.. - Yeah, I think that most people that, outside, 00:00:25,980 look into this industry have no idea how tough it is.. Like most of the major drug companies, Pfizer, Merck, Sanofi, BMS, Bristol-Myers Squibb, they're based on like five or six drugs, period.. That's what drives the vast majority of their revenue.. And almost all the value in that industry accretes to the asset.. That's what makes it so hard versus other industries to structurally amass the data, because it's really hard to get paid for that fundamental generation of data-driven insight.. Think about Intel or Nvidia, right? The ships really do well in this industry.. That has not been true historically in life sciences.. All the value accretes to the asset that goes into the clinic..

And so that has made it much more difficult to fund the stacking of knowledge.. Plus, knowledge is very siloed.. So when you think about the ability to look at all the data that's, as you said, on the web and build these large language models, you had a lot of places you could go to get that data.. You have a lot of wall gardens, right, in the biology area and less incentive.. It's a very artisanal process.. That's also, for me, the reason I'm doing it.. Because when we think about the problems that we solve in humanity, that motivated me to do Montai.. it turns out one of my kids has this really debilitating chronic disease to which there is no great solution.. And I think there's no no better motivated entrepreneur than a mom on a mission.. And for me, when I looked at this industry, when I was working at Ancestry, I said, "There has to be a better way," as you said..

10% odds at a billion dollars.. Like just think about the value creation upside from thinking differently about how we approach this problem and use computation.. But you are not wrong that we still do not know so much about human biology.. And everyone in this room, we are very heterogeneous.. There's not that much that differentiates our DNA, but how our bodies actually work, what we eat, the environment, right? All the other things around us that we're exposed to and how they respond has a lot of intricacies that we're just beginning to untangle.. And this is one of the reasons why we look at this as the biology century, because we're now able for the first time to amass the fidelity of data at scale and be able to interrogate it so that we can actually start to untangle some of these mysteries for the first time.. It would be wonderful if all.... I would love it as a tech person, right, if all the pharma companies in the world shared all the data from all their clinical trials and you are

required to post that and share all the details from those trials.. We would make a lot more progress faster.. Unfortunately, that's not required..

So in the meantime we have to find other methods.. And so you can imagine that's exactly how we came up with our hypothesis at Montai.. How do we start with chemistry that's already been chronically in the human body? We already know that the scaffolds can be tolerated on an ongoing basis.. If we're going to create a chronically-dosed medicine, I sure as heck would rather have something that I'd known have already been in a person, for a law often for a long time.. But then I have to figure out how do I precision match those into biologic pathways.. And that's where AI gets really interesting in understanding the chemistry and doing that precision matching.. By the way, it's actually how drug development started in the thirties and forties.. We serendipitously discovered antibiotics and all these things, but it was serendipitous.. What's awesome about AI is we can now make it predictable.. So you have to take a really hairy problem like that and then try to find a way to break it down..

And it's also why I only am pursuing clinically validated pathways, in the beginning.. We already know that there's, for example, a biologic medicine.. Unfortunately, in chronic diseases, take just inflammation and autoimmune, we spend $165 million, billion, excuse me, billion dollars, 65 billion of that goes on biologics that go to less than 10% of the patients.. And yet we have 60% of our country that suffers from at least one of these chronic diseases.. We gotta make pills, pill based format so we can make these more affordable, accessible, and help more people.. That's what we're trying to do.. And you have to like, you gotta break it down, you gotta cut some of that complexity off...