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When large incumbents leave significant but challenging markets, leaner startups can leverage new technologies to drive change. As big pharmaceutical companies shy away from neurological disease research, Verge Genomics founder and CEO Alice Zhang describes how a confluence of technological advances in genomics is creating new opportunities. New nontraditional biotech companies, she observes, are being built by multidisciplinary teams fluent in both biology and computer science.



Transcript

- So I talked about some of the challenges with drug discovery and in no other disease is it as severe as in neuro degeneration.. So Alzheimer's disease, currently is the only disease that has actual growing death rates and it's the only disease of top diseases in which there's no drug that can slow, prevent, or cure these diseases.. And as we all get older, we'll be increasingly affected by these diseases.. So why can't we figure it out? It's because these diseases are incredibly complex and the traditional drug discovery method isn't sufficient to tackle them.. In fact in the last year, there have been seven billion dollar Alzheimer's failures from Big Pharma and in fact, last year Pfizer announced that it was shuttering its entire neuro science division, laying off over 300 employees.. But what is less written about is the scientific and technological renaissance that's actually happening in neuro science right now.. And I think it's super interesting because any time you have a big incumbent that is turning away from a huge untapped market, combined with a convergence of technological advances, you create this sort of money ball opportunity for smaller companies to really come along and transform the entire landscape.. I'll talk about a couple of these advances.. The first of course is genomics.. So in 2000, some of you might've seen this figure..

In the 2000's it cost over 100 million dollars to sequence a single genome, today it costs less than \$1000.. And in fact this has dropped so quickly that it's even surpassed what's predicted by Moore's Law of Computing Cost.. And so just like the decline in computing cost has fundamentally changed the way we interact with the physical world, I think that this increase in genomic data will change the way we think about disease.. Now I'm going to talk about three additional technologies that we use at Verge to get a leg up on drug discovery.. The first is that we are one of the first to actually be able to collect brain samples and sequence them from live patients with Parkinsons disease so this is deep brain stimulation, it's an advance in surgery that allows us to implant a device into a patient's brain and turn it on to prevent Parkinsons patients from having tremors.. But there's also a second unexpected advantage here which is that we can actually access patient tissue from a patient while he or she is still living and sequence it to be the first to get an unprecedented glimpse into earlier disease progression.. We've also started single cell sequencing which is a technology I think will revolutionize genomics in the next five years..