As the cost of DNA sequencing continues to drop, academics and biotech companies have been waiting for more individuals to sequence and share their full genomes. But so far, that isn’t happening. Personal genomics companies, such as 23andMe and Ancestry.com, perform consumer genotyping, a relatively inexpensive process that identifies single DNA letters at regular intervals across the genome. While such genotyping has become popular, academics, medical researchers, and pharmaceutical companies want something different. They want whole genome sequences—every single one of the roughly 6.4 billion letters in the human genome—to do research, develop drugs, and more. But they’re not getting them: Consumers have been loath to pay up to US $1,000 for full genome sequencing, and they are even more wary of sharing that detailed, private data.

Nebula Genomics, a new startup cofounded by Harvard biologist and sequencing pioneer George Church, says it can solve both problems using the blockchain, the decentralized technology that enables cryptocurrencies like Bitcoin. In a 28-page white paper published quietly in February, the company’s founders describe their aims: to use the blockchain to reduce the costs of personal genome sequencing, to cut out the middlemen, and to make it easy for individuals to share full genome sequences. “Who knows what will be possible to do with your genome a decade or two from now? People are concerned about giving up ownership to someone else,” says Kamal Obbad, an ex-Googler and Harvard graduate who will lead Nebula as CEO. “We’re working to address those pain points.” Users who opt to have their genomes sequenced and stored with Nebula (the actual DNA sequencing would be done by another of Church’s companies, Veritas Genetics) would continue to own and control access to their personal DNA sequences. Sounds logical, but that has not been the norm in the consumer genomics field: Many leading genotyping companies require users to relinquish ownership of their genetic data and then in turn sell it to others. Nebula will do none of that, says Obbad: Consumers will choose where to store their data and who gets access to it.

The Nebula network, built on the Blockstack platform and an Ethereum-derived blockchain, will allow consumers to remain anonymous, although data purchasers, such as pharmaceutical companies, will be required to be fully transparent. All transactions between consumers and purchasers will be private, stored in the blockchain, and powered by a cryptocurrency called Nebula tokens.

Here’s a rough idea of how it will work: Nebula will ask consumers to participate in detailed health surveys; then, companies interested in particular traits or diseases will pay consumers with those characteristics Nebula tokens to access their genetic data. Consumers can use those tokens to pay for their own genetic sequencing. Thus companies will subsidize the cost of consumer sequencing for access to the data they want.

It is unclear how valuable the Nebula tokens will be to users after their sequencing is complete, but Obbad suggests people might eventually use tokens to pay for third-party apps that interpret genetic data, such as a cosmetics line matched to one’s genetic profile.

To make all this happen, Nebula is banking on the continued decrease of sequencing costs. The first human genome, sequenced in 2001, racked up an estimated $2.7 billion. Today, the sequencing giant Illumina is working on a platform expected to enable a $100 genome.

Nebula has received $600,000 in funding from an angel investor, and it expects to make another funding announcement soon, says Obbad. The company is hoping to have a first version of the Nebula network ready for users in six months.

—Megan Scudellari

A version of this article appears in our Human OS blog.