



Biggest gene sequence project to launch

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8 a.m. March 4, 2014



J. Craig Venter *U-T San Diego*

Maverick La Jolla geneticist [J. Craig Venter](#) is opening the largest genetic sequencing center in the world in hopes of enabling countless people to live longer, healthier lives.

Venter says he'll soon begin sequencing up to 40,000 genomes a year, and quickly ramp up to 100,000, to find the mutations that contribute to age-related illnesses such as heart disease and cancer, which collectively kill about 1.2 million people a year in the U.S.

The 67-year-old Venter will announce this morning that the sequencing will be done by a new La Jolla-based company, [Human Longevity, Inc.](#), which has already raised \$70 million. He cofounded HLI with two notable futurist/physicians, [Robert Hariri](#) and [Peter Diamandis](#).

Cancer is the company's first target. HLI also will tackle increasingly common afflictions such as Alzheimer's and Parkinson's disease. The diseases are a large and growing focus of local scientists, including those at UC San Diego, which last year created an Institute for Genomic Medicine.

"This is the first shot across the bow of the changing of the U.S. medical system," Venter said Tuesday morning in a conference call with reporters.

HLI has partnered with the University of California San Diego to get cancer patient information, with their consent, through UC San Diego Moores Cancer Center. Venter said the company plans similar partnerships with hospitals worldwide.

Along with mass DNA sequencing, HLI will compile health databases and apply stem cell technology to find better treatments to the most common age-related diseases. The company plans to make money by licensing its databases to biotechs, drug companies and research centers.

Venter is moving to capitalize on [a major technological advance by San Diego's Illumina](#), widely considered to be the world's leading sequencing company. As recently as 2007 it cost about \$10 million to sequence one genome. Illumina found ways to process samples more quickly and cheaply. In January, the company announced a new sequencing system that lowered the cost of analyzing one genome to less than \$1,000 – a figure that seemed inconceivable when the Human Genome Project began in the 1990s.

The company is buying two of Illumina's new [HiSeq X Ten Sequencing systems](#), which sell for \$10 million each. These can sequence genomes in about three days, and do roughly 32 of them in one week. It took scientists 13 years, and cost about \$3 billion, to sequence the first genome, a project that was completed in 2003.

HLI "is going to change the way medicine is practiced by helping to shift to a more preventive, genomic-based medicine model which we believe will lower healthcare costs," Venter said in a statement. "Our goal is not necessarily lengthening life, but extending a healthier, high performing, more productive life span."

The plan drew praise from such people as La Jolla cardiologist-geneticist Eric Topol, who will preside over this week's Future of Genomic Medicine Conference in La Jolla, where Venter will elaborate on his project.

"This represents an enormous commitment to sequencing a large number of individuals with the laudable goal of improving health and health span," said Topol. "Ultimately, we will need millions of people with whole genome sequencing, across all ancestries and representing all the diverse medical conditions, to be fully informative for future generations and accomplish this goal."

Larry Smarr, a prominent UC San Diego computer scientist and well known advocate of using technology to advance medicine, said, "I think this project is very doable with Illumina's new sequencers. And Craig is more capable than anyone I know of bringing together technology and science to attack longevity, which will be more of an issue as baby boomers age. Baby boomers are going to want to live longer, and to live well."

The 65-year-old Smarr, who has had his genome sequenced, added that, "Common medical genetics is still in the very earliest stages of impacting diagnostics and treatment. But that will radically shift in the next five



to 10 years. Craig is going to sequence both the microbiome, which contains 99 percent of the genes in your body, and the human genome, which has the other one percent. He will capture a full genetic look at the human super-organism."

The average lifespan of Americans is about 78.7 years, about 30 years higher than it was in 1900. But while people are living longer, the added years are often spent in fragile health. The goal of HLI is to delay the underlying aging-related deterioration that's the root cause, the innumerable accretion of cellular genetic defects that ultimately proves fatal.

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