

NHGRI-Funded Researcher Among Pioneer Awardees



Stephen R. Quake, Ph.D., a researcher funded by the National Human Genome Research Institute (NHGRI), is among the first recipients of the National Institutes of Health (NIH) Director's Pioneer Award, which were announced on Wednesday, September 29, 2004. Dr. Quake, formerly of the California Institute of Technology, and currently a professor of bioengineering at Stanford University has received substantial funding from NHGRI for highly innovative research that may dramatically improve the technologies used to advance genomics.

NHGRI first supported Dr. Quake with a FIRST award for new investigators in 1997 for his work in developing integrated nanofluidic chip systems and novel chemistry for single molecule DNA sequencing. A result of that project is what appears to be the first published report of single molecule DNA sequencing (*Proceeds of the National Academy of Sciences (PNAS) 2003*. 100:3980). More recently, Dr. Quake received a Bioengineering Research Partnership award, also from NHGRI, for developing devices and protocols with which to generate cDNA and genomic DNA libraries from small numbers of cells (1-1,000).

His efforts have developed new technology - a microfluidic chip about the size of a quarter that is able to quickly process very small biological samples - that could revolutionize how laboratories conduct biomolecular analysis, making it easier and quicker. In turn, this could make genomic research cheaper and faster. As important, these devices will enable new kinds of studies that will reveal differences between the individual cells that make up our tissues, or that undergo changes leading to diseases such as cancer.

Currently, automatic systems for biomolecular analysis are large - analogous to the vacuum tube computers of the 1950s. They not only take up a lot of space, they are expensive, hard to tie together in a series and difficult to maintain. Dr. Quake's research could change all that, making the equipment that now fills a room, fit on a single lab bench.

Dr. Quake told *Nature Biotechnology* earlier this year that his goal was to improve automation in biological research. "We'd like to create fully automated systems that are on chips, easy to use - and general, universal and inexpensive."

Formerly of the California Institute of Technology, Dr. Quake is currently a professor of bioengineering at Stanford University. A physicist by training, Dr. Quake's lab is broadly interested in biophysics and bioengineering, and uses techniques such as single molecule spectroscopy and microfluidics to address a variety of fundamental and technological questions.

Dr. Quake is not a stranger to awards for innovation. In 2002, *Technology Review*, a publication of the Massachusetts Institute of Technology, named him as one of the "100 innovators under 35 whose work and ideas will change the world."

The NIH Director's Pioneer Award program was designed to support individual scientists and thinkers with highly innovative ideas and approaches to contemporary challenges in biomedical research. The award provides \$500,000 in direct costs per year for five years to each recipient, allowing them the time and resources to test far-ranging ideas with the potential to make extraordinary contributions to medical research. Applicants were evaluated based on evidence of scientific innovation and creativity; testimony of intrinsic motivation, enthusiasm and intellectual energy; and potential for scientific leadership and evidence of, or potential for, effective communication skills.

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