

New frontiers in bioscience

In 1975, when relatively powerful microprocessors first became available, many young entrepreneurs—including myself—were inspired to create companies, platforms, and programming tools that helped make computing available to everyone. This in turn helped spark the information revolution. Today, thanks to the increasing sophistication, speed, and power of computer modeling and other new tools such as optogenetics and multiple forms of microscopy, we are on the brink of another revolution—this time in bioscience.

In laboratories around the world, some of the brightest scientists—well-established and those early in their careers—are conceiving novel theories at the very forefront of knowledge. In tissue regeneration, multilevel function, multiscale modeling, longevity, and other cutting-edge fields, breakthrough research will soon enable us to improve human health and perhaps even reveal the deepest mechanisms of life itself. It is this promise that motivates my own investment, and I imagine that of others, in the new frontiers of bioscience.

The complexity of biology is a fascinating challenge, and I am keen to see the field deconstruct its mysteries, establish reliable and predictive models, and put that knowledge to work. Such innovative and creative work drives human progress, and it is this belief that fuels my ongoing support for basic science. Toward this end, I've invested in the Allen Institute for Brain Science and the Allen Institute for Cell Science, and just last week launched the new Frontiers Group—a part of the Allen Institute—which supports researchers at academic institutions around the world. In recent years, organizations such as the Howard Hughes Medical Institute, W. M. Keck Foundation, Kavli Foundation, Gordon and Betty Moore Foundation, and Simons Foundation have also made important investments in

groundbreaking bioscience.

Such investments in bioscience are catalysts for change. But to make the transformational advances we seek, all of us—philanthropists, governments, universities, and private companies alike—must invest much more in basic, fundamental science and in the intrepid scientists who are willing to pursue out-of-the-box approaches at the very edges of knowledge.

We should also be working more aggressively to break down scientific silos by backing more collaborative, interdisciplinary teams that include experts in bioscience, mathematics, computer science, medicine, engineering,

and other fields. For example, the Human Genome Project succeeded because of the convergence of massive computing power, new algorithms, expertise in laboratory biology, and broad support from the public and private sectors. We need more of that, more often, to keep advancing bioscience.

This type of bold, sweeping, integrative research inevitably entails the likelihood of setbacks and sometimes outright failure. As a consequence, some consider such science as too risky to support with the level of investments that I advocate. But what they fail to recognize is that the much larger risk to society lies in not committing enough to tackle the most complex or daunting frontiers. Without risk, there is

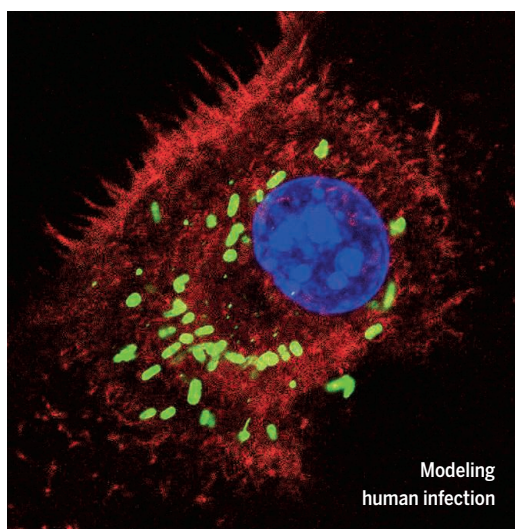
rarely reward, and unless we attempt more “bleeding edge” approaches, efforts to prevent pandemics, defeat dementia, or cure cancer may take much longer than they should.

We must do better, and we can. If we champion new research pioneers, cultivate a spirit of open collaboration, and aggressively fund science at the frontiers, the 21st century will ultimately yield answers to the biggest questions in bioscience. A much brighter future lies just over the horizon—if we commit to charting a bolder course.

— Paul G. Allen



Paul G. Allen is the cofounder of Microsoft, the chief executive officer of Vulcan Inc., a recipient of the 2015 Carnegie Medal of Philanthropy, and the founder of the Allen Institute for Brain Science, Institute for Cell Science, and Institute for Artificial Intelligence. Twitter @PaulGAllen. E-mail: Frontiers@AllenInstitute.org



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