2011 Inventor of the Year

David Baker, PhD

DAVID BAKER, PHD., is an Investigator of the Howard Hughes Medical Institute (HHMI) and Professor of Biochemistry with adjunct appointments in Genome Sciences, Bioengineering, Computer Science, Chemical Engineering, and Physics. Dr. Baker graduated from Harvard University in 1984, completed his PhD in Biochemistry at University of California (Berkeley) in 1989, and then began working on protein structure as a postdoctoral fellow in Biophysics at University of California (San Francisco). Dr. Baker is now regarded as a world-leading expert in computational protein structure prediction and design. He is a member of the National Academy of Sciences, one of the world's highest rewards for scientific excellence and the recipient of numerous awards, including the AAAS Newcomb Cleveland Prize, the International Society for Computational Biology Overton Prize, and the Raymond and Beverly Sackler International Prize in Biophysics. He has also received such honors as the National Science Foundation Young Investigator Award (1994), Packard Fellowship in Science and Engineering (1994), Beckman Young Investigator Award (1995), Protein Society Young Investigator Award (2000), International Society for Computational Biology Overton Prize (2002), AAAS Newcomb Cleveland Prize (2004), Foresight Institute Feynman Prize (2004), and the Sackler Prize in Biophysics (2008). He has published over 230 papers.

Dr. Baker has made fundamental progress in predicting and designing new macromolecular structures, interactions, and functions. His Rosetta computational suite can predict protein structures from DNA sequence, and design new proteins of almost any shape or activity. This giant step forward enables the full potential of the human genome sequence to be realized in drug design, gene therapy, vaccines, and personalized medicine; and it opens the door to designing new proteins capable of green chemistry, bioremediation, and biofuel transformations. Dr. Baker has also developed exciting new modalities for engaging the general public in scientific research including Rosetta@home (http://boinc.bakerlab.org/rosetta) and FoldIt, a multiplayer online game for predicting protein structures (http://fold.it).

Building on his expertise, Dr. Baker founded Bio Architecture Lab, a pioneer in the use of synthetic biology and computational enzyme design. Their goal is to develop novel specialty chemicals produced from renewable carbon sources in order to produce the world's lowest cost, most scalable, and sustainable source of sugars for biofuel and renewable chemical production. Dr. Baker also co-founded Arzeda, whose biochemical products aim to replace petroleum-based products. In December of 2010 Arzeda and DuPont Business Pioneer Hi-Bred reached the first milestone in a technology collaboration to develop new traits to increase agriculture productivity. Their work was featured in a Microsoft Case Study to showcase its innovative use of cloud computing for solving challenging computational problems.