

ENI AWARD 2014

Renewable Energy Prize

Jay D. Keasling

Winner

Microbial Production of Hydrocarbon Fuels

Biography

Today, Jay D. Keasling is considered one of the foremost authorities in synthetic biology, especially in the field of metabolic engineering. He is a Professor of Chemical engineering and Bioengineering at the University of California, Berkeley, also serving as Associate Laboratory Director for Biosciences at the Lawrence Berkeley National Laboratory, Chief Executive Officer of the Joint BioEnergy Institute, and Director of the Synthetic Biology Engineering Research Center.

Professor Keasling received a Bachelor's Degree in Chemistry and Biology at the University of Nebraska-Lincoln in 1986. In 1988, he obtained his M.S. and in 1991 his PhD in Chemical Engineering at the University of Michigan under the supervision of Bernhard Palsson and Stephen Cooper. From 1991 to 1992, Professor Keasling performed post-doctorate research in the Department of Biochemistry at Stanford University.

The current research interests of Professor Keasling concern the metabolic engineering of the *Escherichia coli* and *Saccharomyces cerevisiae*, aimed to produce biofuels. The research in the Keasling Laboratory focuses on the metabolic engineering of microorganisms for degradation of environmental contaminants, as well as for environmentally friendly synthesis. Keasling developed a number of new genetic and mathematical tools to allow more precise and reproducible control of metabolism. These tools are being used in such applications as synthesis of biodegradable polymers, accumulation of phosphate and heavy metals, as well as degradation of chlorinated and aromatic hydrocarbons, biodesulfurization of fossil fuels and complete mineralization of organophosphate nerve agents and pesticides.

The outstanding career of Professor Keasling was recognized by numerous awards. In 2006, *Discover magazine* proclaimed Jay Keasling Scientist of the Year. In 2007 Professor Keasling won the Professional Progress Award from the American Institute for Chemical Engineers.

In 2009, Professor Keasling was awarded the first annual Biotech Humanitarian Award by BIO, the Biotechnology Industry Organization. In 2012, Keasling was awarded the Heinz Award for Technology, the Economy and Employment. In 2013, BIO awarded Keasling the George Washington Carver Award for Innovation in Industrial Biotechnology.

Keasling has received numerous research grants for his work. In 2004, the Bill and Melinda Gates Foundation awarded him a \$ 42.5 million grant to develop and distribute the low-cost malaria treatment based on Keasling's technology. In 2007 and 2012, the US Department of Energy awarded Keasling a \$125 million grant to fund the Joint BioEnergy Institute in Emeryville, CA.

Keasling is a Member of the United States National Academy of Engineering.