

The George Washington Carver award presented annually at the BIO World Congress on Industrial Biotechnology and Bioprocessing honors the original vision of George Washington Carver who, over a century ago, achieved world renown by using agriculture and science to produce everyday products, changing the nature of farm economics and sustainability. Carver was an originator of the "chemurgy" movement and devoted his career to teaching sustainable farming, which for him included developing new uses of agricultural products that could boost farm profits. To help farmers adopt sustainable practices, Carver and his students developed more than 300 industrial uses for peanuts, sweet potatoes, and other crops that could be grown in rotation with cotton and corn. Carver's inventions included plastics, glue, soaps, paints, dyes for cloth and leather, medicines and cosmetic ingredients made from peanuts, sweet potatoes, or other crops and agricultural residues.

Today, companies are using industrial biotechnology to manufacture plastics, chemicals, pharmaceuticals, and even food ingredients from renewable agricultural resources. The George Washington Carver Award will honor individuals in the private sector, government or academia who have worked toward the important goal of using industrial biotechnology innovation to develop sustainable bio-based value-chains.

BIO presented the first annual George Washington Carver Award in **2008** to Dr. **Patrick Gruber**, CEO, Gevo, Inc., recognizing his accomplishments in creating and commercializing a new plastic made from annually renewable resources. As vice president and chief technology officer of Cargill Dow LLC/NatureWorks from 1997 to 2005, Gruber spearheaded the market introduction of NatureWorks™ PLA and Ingeo™ fibers. He oversaw the construction and launch in 2000 of the first large-scale manufacturing facility for a material developed from 100 percent annually renewable resources. He led the company's efforts of continual process and technology improvement, making NatureWorks™ PLA a major influence in the global plastic and fibers markets.

In **2009**, BIO presented the award to DuPont Chairman of **the Board Charles O. Holliday, Jr.**, recognizing his commitment to industrial biotechnology as a tool for sustainable business growth. During Holliday's tenure as CEO, DuPont invested in biology-based businesses and infused them with its chemistry know-how. For instance, DuPont partnered with sugar processor Tate & Lyle to manufacture 1, 3 propanediol, a polyester ingredient made by fermenting sugar. That venture led the company to think about applying its fermentation expertise to making renewable fuels and chemicals in a biorefinery.

In **2010**, the award was given to Dr. Greg Stephanopoulos of MIT. Dr. **Greg Stephanopoulos** is currently Bayer Professor of Chemical Engineering at MIT. He has developed processes integrating highly engineered microbes in industrial settings to produce amino acids, such as lysine and isoleucine; indandiol, an essential precursor of the AIDS drug Crixivan; and important diterpenes, such as lycopene and taxadiene, a precursor to the cancer drug taxol. His current work focuses on engineering a microbe for cost-effective production of oil and biodiesel.

In **2011**, the award was given to **Feike Sijbesma** of Royal DSM NV. Feike Sijbesma studied Medical Biology at the University of Utrecht and Business Administration at Erasmus University in Rotterdam. In 1987, he joined the Industrial Pharmaceuticals Division of Gist-brocades NV, where he was responsible for strategic planning and business development. From 1990 to 1993, he was appointed the division's marketing and sales director. Thereafter, he was given leadership of savory ingredients, later on a business unit of Gist-brocades' Food Specialties Division. In 1995, he was made director of that division and joined the Gist-brocades' Executive Committee. Following the acquisition by Royal DSM NV in 1998, he became the director of the business group DSM Food Specialties. In 2000, Feike joined DSM's Managing Board of Directors. He became CEO and Chairman of the Managing Board of Royal DSM NV on May 1, 2007.

In **2012**, the award was given to **Steen Riisgaard**, former President and CEO of \ Novozymes A/S. Mr. Riisgaard joined Novo in 1979 as a microbiologist in Enzymes R&D. In 1982 he went to Tokyo to start up an Enzymes R&D unit in Novo's subsidiary, Novo Industri Japan Ltd. He returned to Denmark in 1985 as director of Enzyme Process Research and the following year was appointed vice president of the Detergent Enzyme Division. In 1989 he was promoted to corporate executive vice president with special responsibility for Enzyme Business, including Enzyme Research, Enzyme Development and Application, Enzyme Production, Enzyme Operations and all of Novo Nordisk's activities in China. Prior to joining Novo Nordisk, Mr. Riisgaard was a research fellow at the Serum Institute of Denmark (1976-77) and a research microbiologist at Foss Electric, Denmark. Mr Riisgaard received his MSc in Biology from the University of Copenhagen.

In **2013**, BIO presented the award to Dr. **Jay Keasling** who is the Hubbard Howe Jr. Distinguished Professor of Biochemical Engineering at the University of California, Berkeley in the Departments of Bioengineering and Chemical and Biomolecular Engineering, senior faculty scientist and Associate Laboratory Director for Biosciences at Lawrence Berkeley National Laboratory, Chief Executive Officer of the Joint BioEnergy Institute (JBEI), and director of the Synthetic Biology Engineering Research Center (SynBERC). Dr. Keasling's research focuses on the metabolic engineering of microorganisms for degradation of environmental contaminants or for environmentally friendly synthesis of drugs, chemicals, and fuels. Dr. Keasling received a B.S. in Chemistry and Biology from the University of Nebraska and M.S. and Ph.D. in Chemical Engineering from the University of Michigan, and did post-doctoral research in biochemistry at Stanford University. He is a member of the National Academy of Engineering. Dr. Keasling received the inaugural *Biotech Humanitarian Award* from the Biotechnology Industry Organization in 2009, the 2007 *Professional Progress Award* from the American Institute for Chemical Engineers, the first ever *Scientist of the Year* award from Discover Magazine in 2006, and the *Technology Pioneer* award from the World Economic Forum in 2005. Dr. Keasling is the founder of Amyris, LS9, and Lygos.

In **2014**, the George Washington Carver Award was given to **Ellen Kullman**, who has served as chair of the board of directors and chief executive officer of DuPont since 2009.

A native of Wilmington, Del., Ellen has championed the power of DuPont science and global market knowledge to transform industries. Under her leadership, she has decisively

positioned the company as a higher growth, higher value, less cyclical company. Decision making has moved closer to customers around the world, resulting in greater partnering, collaboration and innovation attuned to local needs.

Prior to being appointed chair of the board and chief executive officer, Ellen served as president, executive vice president and a member of the company's office of the chief executive. During her 25-year career with DuPont, Ellen has led the company's focus on growth in emerging international markets, led double-digit growth of the company's Safety & Protection business portfolio, started-up two successful high-growth businesses known today as DuPont Industrial Biosciences and DuPont Sustainable Solutions and run several industrial businesses, including White Pigment & Mineral Products. Ellen began her career at DuPont in 1988 as a marketing manager for the DuPont medical imaging business. Prior to joining DuPont, Ellen worked for Westinghouse and General Electric.