

ENI AWARD 2016

Protection of the Environment Prize

David Milstein

Winner

Novel, Environmentally Friendly, Efficient Catalytic Reactions to Replace Polluting Processes

Biography

David Milstein holds the Israel Matz Professorial Chair of Organic Chemistry, and is the Director of the Kimmel Center of Molecular Design at the Weizmann Institute of Science in Israel. He was born in 1947 in the city of Ulm in post-war Germany, in a displaced people camp where his Holocaust-surviving parents stayed before immigrating in 1949 to the newly founded state of Israel. He received a Ph.D. degree from the Hebrew University in Israel in 1976 with Prof. J. Blum, and performed postdoctoral research at Colorado State University with Prof. John K. Stille. In 1979 he joined DuPont Company's Central Research and Development Department in Wilmington, Delaware, USA, where he became a Group Leader in the field of homogeneous catalysis. In 1987 he joined the Weizmann Institute of Science in Israel, where he became a full professor and headed the Department of Organic Chemistry in 1996-2005.

Professor Milstein is world renowned for his ground-breaking work in the fields of organometallic chemistry and catalysis. As a post doc, he co-discovered in 1978 the Stille reaction, a very important, widely used method for formation of carbon-carbon bonds. He demonstrated the first direct metal insertion into unstrained, strong carbon-carbon bonds, and discovered the first homogeneous catalytic activation of the very strong C-F bonds. His research interests in recent years include the design and applications of environmentally benign catalytic reactions which produce no waste and use little energy, as well as catalysis aimed at sustainable energy, including water splitting, liquid organic hydrogen carriers, biofuels, and CO₂ utilization. His novel method for the activation of chemical bonds, based on metal-ligand cooperation, has led to many "green", synthetically useful catalytic reactions which either generate hydrogen gas or consume it. For example, he developed a novel method for the formation of amide bonds, which are of central importance in chemistry and biology, by catalytic coupling of amines and alcohols, with hydrogen gas being the only by-product; it was named by Science magazine among the major scientific breakthroughs of the year 2007.

His widely recognised research accomplishments have been acknowledged by several awards from various countries, including Kolthoff Prize from the Technion-Israel Institute of Technology (2002); Israel Chemical Society Prize (2006); American Chemical Society Organometallic Chemistry Award (2007), Sir Geoffrey Wilkinson Award by the Royal Society of Chemistry, UK (2010); Humboldt Senior Research Award by the Humboldt Foundation (2011); and the Israel Prize (Israel's highest honor) in Chemistry and Physics (2012). He is a member of the Israel Academy of Sciences and Humanities, and the German National Academy of

Sciences-Leopoldina. He is the recipient of many lectureship awards from renowned universities and research institutes around the world, and has served on several Editorial Boards and international committees.