Biography

Dr. Breaker is currently Chair of the Department of Molecular, Cellular and Developmental Biology at Yale University where holds the Henry Ford II Professorship. He is jointly appointed as a professor in the Department of Molecular Biophysics and Biochemistry, and is an Investigator with the Howard Hughes Medical Institute. Dr. Breaker received his B.S. degree with a major in biology and a minor in chemistry from the University of Wisconsin – Stevens Point. His Ph.D. thesis research was carried out with Dr. Peter Gilham at Purdue University and focused on the synthesis of RNA and the catalytic properties of nucleic acids. As a postdoctoral researcher with Dr. Gerald Joyce at The Scripps Research Institute, Dr. Breaker pioneered a variety of "test-tube evolution" strategies to isolate novel RNA enzymes and was the first to discover catalytic DNAs or "deoxyribozymes" using this technology.

Since establishing his laboratory at Yale in 1995, Dr. Breaker has continued to conduct research on the advanced functions of nucleic acids, including ribozyme reaction mechanisms, molecular switch technology, next-generation biosensors, and catalytic DNA engineering. His laboratory has established the first proofs that metabolites are directly bound by messenger RNA elements called riboswitches, has discovered more than two dozen distinct classes of these RNA gene control elements, and has published the first studies validating riboswitches as targets for antibiotics. Dr. Breaker's research findings have been published in more than 130 scientific papers, book chapters, and patents, and his research has been funded by grants from the NIH, NSF, DARPA, the Hereditary Disease Foundation, and from several biotechnology and pharmaceutical companies. He is the recipient of fellowships from the Arnold and Mabel Beckman Foundation, the David and Lucile Packard Foundation, and the Hellman Family Trust. In recognition of his outstanding research accomplishments at Yale, Dr. Breaker received the Arthur Greer Memorial Prize (1997), the Eli Lilly Award in Microbiology (2005), the Molecular Biology Award from the U.S. National Academy of Sciences (2006).

In 2001, Dr. Breaker co-founded Archemix, a Cambridge, MA biotechnology company developing engineered aptamers as therapeutic agents. In 2005, Dr. Breaker co-founded BioRelix, a New Haven, CT biotechnology company developing antibiotics that target bacterial riboswitches. He participates on several scientific advisory boards and serves on the editorial boards for several scientific journals.