The Twenty-seventh

Jacob Bigeleisen Endowed Lecture

Presents

Dr. Laura L. Kiessling

Novartis Professor of Chemistry
Department of Chemistry
Massachusetts Institute of Technology

MICROBIAL GLYCANS IN HEALTH AND DISEASE

Thursday, April 14, 2022
Lecture starts at 4:00 p.m.
Charles B. Wang Center Theater
Stony Brook University
Refreshments served at 5:15 p.m. in the Theater lobby
Hosted by: Department of Chemistry

Dr. Laura Kiessling began her undergraduate studies at the University of Wisconsin at Madison, but transferred to the Massachusetts Institute of Technology (MIT) after a spring break trip to Boston, because she saw so many women excelling in science there. She earned her BS in Chemistry from MIT, where she carried out research into asymmetric organic transformations with Professor Bill Roush. She followed her interest in organic synthesis to Yale, where she worked in the group of Stuart Schreiber. Her graduate research laid the foundation for the group's synthesis of the ene-diyne core natural product calicheamicin γ, a DNA-cleaving compound with anticancer activity. She postulated that the sugars of this natural product were critical for DNA recognition, a hypothesis that was later borne out in subsequent research by the Danishefsky and Kahne groups. Kiessling's interest in DNA recognition led her to postdoctoral studies at Caltech with Peter Dervan. There, she synthesized the first non-natural bases to recognize mixed DNA sequences via triple helix formation.

Dr. Kiessling's graduate and postdoctoral studies sparked an interest in understanding the recognition mechanisms of glycans in her independent career. Because individual protein-glycan interactions are weak ($K_d = 10^{-3}$ M), she sought to understand and leverage multivalency to explore these processes. She recognized that defined multivalent ligands could serve as mechanistic probes and leads. Her approach to generate such ligands was to use controlled living polymerizations, such as the ring-opening metathesis polymerization (ROMP). Indeed, she was the first to use ROMP to synthesize bioactive polymers. She also pioneered the concept of "post-polymerization modification" to generate a series of polymers whose activities can be compared directly.

Dr. Kiessling is an institute member of the Broad Institute of MIT and Harvard, a member of the Koch Institute for Integrative Cancer Research at MIT, and the Novartis Professor of Chemistry at MIT. Prior to MIT, she was the Laurens Anderson Professor of Biochemistry and the Hilldale Professor of Chemistry at the University of Wisconsin, where she also directed the Keck Center for Chemical Genomics. In 2005, she was recruited by the American Chemical Society to serve as the founding Editor-in-Chief of ACS Chemical Biology, where her leadership and innovation led to ACS Chemical Biology receiving the 2007 Award for Innovation in Journal Publishing from the American Publishing Association. Dr. Kiessling's research has been recognized with a MacArthur Foundation Fellowship (1998) and a Guggenheim Foundation Fellowship (2008). In 2018, Kiessling was the first woman to receive the Tetrahedron Award. Kiessling is a Fellow of the American Academy of Arts and Sciences (2003), a Member of the American Academy of Microbiology (2007), the American Philosophical Society (2017), and the National Academy of Sciences (2007).

The Jacob Bigeleisen lectures are supported by an endowment established by a circle of friends on the occasion of his 70th birthday. The purpose of the endowment is to enrich the educational program at Stony Brook through an annual lecture in chemistry by a scholar of international reputation. Jacob Bigeleisen, Distinguished Professor of Chemistry, retired in 1989 after eleven years as an active member of the Stony Brook faculty. Prior to coming to Stony Brook, he was Tracy Harris Professor and Chairman of the Chemistry Department at the University of Rochester. He was a member of the scientific staff of Brookhaven National Laboratory for twenty years before joining the Rochester faculty. He is the recipient of numerous awards and fellowships for his work in pure and applied isotope chemistry. He is a member of the National Academy of Sciences and a Fellow of the American Academy of Arts and Sciences.

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