Dr. Joanna Aizenberg, Harvard University

Bio-Inspired Structured Surfaces for Cellular Studies

Abstract: The ability of organisms to respond to various stimuli provides an inspiration for a modern engineering and science that seek to develop a new generation of materials with dynamic, adaptive properties. I will describe the synthesis, fabrication and characterization of two new bioinspired surfaces: hybrid nano/micro-structures that mimic the echinoderm skin and liquid-infused structured surfaces that mimic carnivorous plant. We demonstrate how the former can be reversibly actuated and assembled into a variety of previously unseen structures with uniform, periodic or chiral nano/micro-patterns, and how the latter can function as an omniphobic surface that repels both liquid and solid materials. The application of these novel substrates as a multifunctional platform for controlling cell differentiation and function, bacterial patterning and preventing biofouling and biofilm formation will be described.

Bio: Joanna Aizenberg is the Amy Smith Berylson Professor of Materials Science; Professor of Chemistry and Chemical Biology, and the Director of the Kavli Institute for Bionano Science and Technology at Harvard University. She pursues a broad range of research interests that include biomimetics, self-assembly, smart materials, nanofabrication, anti-fouling materials, biomineralization, biomechanics and biooptics. She holds the B.S. and M.S. degree in Chemistry from Moscow State University, and the Ph.D. degree in Structural Biology from the Weizmann Institute of Science.

Aizenberg received numerous awards from the American Chemical Society and Materials Research Society, and was recognized with two R&D 100 Awards for her innovative work on developing new, energy-efficient smart materials that adapt to their environment. She is AAAS and APS Fellow, she has served at the Board of Directors of the Materials Research Society and at the Board on Physics and Astronomy of the National Academies, and is currently an Editorial Board Member of *Advanced Materials*.