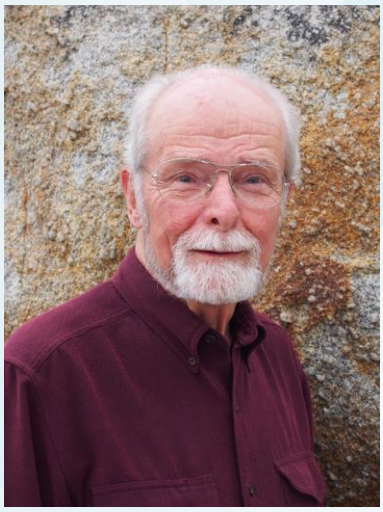
iFAST: The International Forum on Advanced Environmental Sciences and Technology

A series of distinguished seminars by eminent scientists

8 p.m. CDT; 9 p.m. EDT; 1 a.m. GMT (March 18); 9 a.m. Beijing (March 18)

Wednesday, Mar. 17, 2021



George Somero

Stanford University

https://hopkinsmarinestation.stanford.edu/people/george-somero

Professor George N. Somero is the David and Lucile Packard Emeritus Professor of Marine Science at Stanford University's Hopkins Marine Station in Pacific Grove, California. Somero has studied effects of temperature on marine organisms in a wide variety of environments. He received his doctorate from Stanford University for work done on Antarctic fishes that have body temperatures near -2°C. He has subsequently worked in both temperate and tropical environments and currently is studying the hottest known animals, intertidal invertebrates, found along the coast of China, that have body temperatures near 55°C. He also has worked with deep-sea animals, including species found at the seafloor hot springs near spreading centers. His publications include four books on the topic of biochemical adaptation, the most recent being the 2017 volume, *Biochemical Adaptation: Responses to Environmental Challenges from Life's Origin to the Anthropocene*. He is a member of the U.S. National Academy of Sciences, the California Academy of Sciences, a Fellow of the American Association for the Advancement of Science, a John Simon Guggenheim Fellow and recipient of the Helsinki Prize. His alma mater, Carleton College, awarded him an Honorary Doctor of Science Degree. He was given a lifetime achievement award by the Western Society of Naturalists in 2021.

Molecular Adaptation to Environmental Stress: Complementary Roles of Macromolecules and "Micromolecules"

Environmental stressors like temperature and hydrostatic pressure have strongly perturbing effects on biological structures and processes. Nonetheless, organisms have successfully adapted to temperatures spanning a range of over 150°C and pressures as high as 1,100 atmospheres. The success with which organisms have overcome the effects of these physical stressors is due to adaptations in macromolecular structure, e.g., protein amino acid sequence, and in the composition of the small organic solutes of the cells, here termed "micromolecules." These small organic solutes can be strongly stabilizing of macromolecular structure and contribute importantly to offsetting perturbation by physical stressors. Studies of molecular evolution have typically focused on macromolecules, so we are only now coming to appreciate the critical roles played by small organic solutes like methylammonium compounds, polyhydric alcohols and certain free amino acids. Studies of micromolecular effects on macromolecular systems not only teach us important lessons about evolution and molecular adaptation but provide guidance in development of protocols useful in biotechnological contexts.

INSTITUTE FOR ENVIRONMENTAL GENOMICS
The UNIVERSITY of OKLAHOMA

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Register for the Zoom conference at www.ou.edu/ieg/seminars

Organizing Committee Chair: Jizhong Zhou (University of Oklahoma, USA; https://www.ou.edu/ieg)
Xueduan Liu (Central South University, China)

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