



Thursday, October 5, 2017, 12:30 pm
Seaver Science Auditorium, Room 150

SSC Auditorium next to the library

Professor Floyd Romesberg

Department of Chemistry
The Scripps Research Institute

A Semi-synthetic Organism that Stores and Retrieves Increased Genetic Information

Abstract:

Since the last common ancestor of all life on earth, biological diversity has been encoded in a four letter, two base pair genetic alphabet. Expansion of the genetic alphabet to include a fifth and sixth letter and a third, unnatural base pair not only has immediate utility for a number of applications, such as site-specific oligonucleotide labeling, but also serves as the foundation for an organism with an expanded genetic code. Toward this goal, we have examined a large number of different unnatural nucleotides bearing mainly hydrophobic nucleobase analogs that pair based on packing and hydrophobic interactions rather than H-bonding. Optimization based on extensive structure-activity relationship studies and two screens resulted in the identification of a class of unnatural base pairs that are well recognized by DNA and RNA polymerases. More recently, we have engineered *E. coli* to import the requisite unnatural triphosphates and shown that DNA containing the unnatural base pair is efficiently replicated, transcribed, and translated within the cell, resulting in the first semi-synthetic organism that stores and retrieves increased information.

Hosted by Professor Charles McKenna

The scientific community is invited

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