Colloqui della Classe di Scienze

Anno Accademico 2013/2014

19 GIUGNO 2014

ore 15.00

Sala Azzurra
Palazzo della Carovana
Scuola Normale Superiore
Piazza dei Cavalieri, 7

JASON W. CHIN

Head, Centre for Chemical & Synthetic Biology
Programme Leader, Division of Protein & Nucleic Acid Chemistry,
MRC Laboratory of Molecular Biology, Cambridge, UK

Reprogramming the Genetic Code

ABSTRACT

The information for synthesizing the molecules that allow organisms to survive and replicate is encoded in genomic DNA. In the cell, DNA is copied to messenger RNA, and triplet codons (64) in the messenger RNA are decoded - in the process of translation - to synthesize polymers of the natural 20 amino acids. This process (DNA RNA protein) describes the central dogma of molecular biology and is conserved in terrestrial life. We are interested in re-writing the central dogma to create organisms that synthesize proteins containing unnatural amino acids and polymers composed of monomer building blocks beyond the 20 natural amino acids. I will discuss our invention and synthetic evolution of new 'orthogonal' translational components (including ribosomes and aminoacyl-tRNA synthetases) to address the major challenges in re-writing the central dogma of biology. I will discuss the application of the approaches we have developed for incorporating unnatural amino acids into proteins and investigating and synthetically controlling diverse biological processes, with a particular emphasis on understanding the role of post-translational modifications.

Elaborazione a cura del Servizio Comunicazione e Relazioni Esterne SNS

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Info: Area Ricerca e Didattica - classi@sns.it