ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

INSTITUTE OF PHYSICS IPHYS

Seminar in Biological and Statistical Physics

Tuesday, November 15th 2016 at 14h15

Room SV1717
EPFL

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An evolutionary switch in J-protein biology affects prokaryotic and eukaryotic protein disaggregation

Abstract

Decreased cellular capacity in protein aggregate clearance manifests in cellular deterioration, aging and disease1. Toxic intracellular aggregates formed by misfolded proteins are reversed and/or limited by multi-tiered cellular quality control systems2. We recently reported J-proteins of classes A and B cooperate via interclass complex formation to mediate substrate specificity of Hsp70-based aggregate solubilizing systems (disaggregases) in metazoa3. What remains unclear is whether these mixed class J-protein complexes occur also in non-metazoans given the fact that orthologs of both classes exist in bacteria, fungi, plant and protozoa4. Using a broad set of experimental approaches, we find a switching in J-protein biology at the prokaryote-to-eukaryote transition where class members network allowing for the emergence of powerful, yet regulatable eukaryotic disaggregase systems. We also describe a naturally occurring strategy to correctly pair J-proteins of different types, ensuing functional integrity within networks in expanded J-protein families during rise of complex life.

Host: Prof. De Los Rios
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