Colloquium

Meet your Prokaryotic Ancestor: On the Role of Asgard Archaea in the Evolution of Eukaryotes

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Host: Andela Saric / Michl Sixt

The question about the emergence of complex life forms on Earth remains one of the big mysteries in evolution. For about 2 billion years, only microorganisms of the domains Bacteria and Archaea were inhabitants on our planet until the first complex, eukaryotic cells evolved. Current models converge on a symbiosis or a merger, between a bacterium and an archaeon which about 1.8 billion years ago led to the formation of the first complex cell with organelles.This hypothesis is fuelled by the recent discovery of Asgard Archaea.Genomic studies of these archaea and the cultivation of living strains in a Japanese and in our laboratory shed light on the closest known prokaryotic relatives of eukaryotes. They reveal unexpected cellular complexities, as e.g. cell bodies from which extensive protrusions emerge that are filled with actin filaments. Our recent studies on Lokiarchaeum ossiferum reveal more surprises, like cellular plasticity and movements that were previously thought to only occur in eukaryotes.The findings support that an Asgard archaeon was likely the host for the (alpha-)proteobacterial endosymbiont in this crucial event of early evolution that gave rise to all complex life forms.

Monday, December 15, 2025 11:30am - 12:30pm
Raiffeisen Lecture Hall

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