

Ph.D. projects in progress

1.

Mentor: Balázs Papp, Bálint Kintsés

Doctoral school: University of Szeged, Faculty of Science and Informatics, Doctoral School of Biology

Ph.D. student: Ádám Györkei

Title of the research topic: Systematic analysis of protein aggregation routes in a bacterial cell

Description of the research topic: Overexpressed proteins that are vulnerable to aggregation may form inclusion bodies either in their folded or unfolded states in bacteria. The conformational state of the aggregated protein governs its biological activity and hence is of great biotechnological importance. Yet, the prevalence and determinants of these two routes of aggregation remain poorly characterized. In this project, we measure the in vivo aggregation propensity of the entire proteome of *Escherichia coli* using an image-based screen that distinguishes between folded and unfolded aggregates and characterize the protein properties of these two routes.

2.

Mentor: Balázs Papp

Doctoral school: University of Szeged, Faculty of Science and Informatics, Doctoral School of Biology

Ph.D. student: Orsolya Liska

Title of the research topic: Principles of metabolome conservation in mammals

Description of the research topic: The wiring diagram of metabolic networks are highly conserved across all life forms, yet the details of how these network work differ substantially both between and within species. Such differences can be efficiently studied by metabolomics approaches that monitor the concentration of metabolites on a global scale. In this project, we leverage recent comparative metabolome data on mammals to unveil the general principles governing the evolution of intracellular metabolite concentrations and to understand which differences matter for human health.