

Introduction to selected topics in systems biology

Systems biology has emerged as new discipline that aims at connecting the complexity of biological processes to the architecture of underlying genetic networks. During this introductory lecture, I will review basic concepts of Systems Biology, showing how the presence of particular regulatory motifs (such as feedback loops) lead to the emergence of specific dynamical behaviour, which can be assessed using classical concepts from the theory of dynamical systems. Then, I will review key examples taken from the literature in which systems and/or synthetic biology contributed to a better understanding of the function of genetic circuits.