

Welcome to the
Study group in Quantitative
Biology, Biophysics and
Biomaterials

Goals of the study group

- Join faculty, postdocs, graduate students interested in quantitative biology, proteomics, modeling
 - Read and discuss articles and current advances
 - Learn about each other's research
 - Collaborate
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- Please contribute by proposing topics/literature, leading the discussions and giving short presentations about your research

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Complex systems and biology

Biological systems

- are composed of large numbers of functionally diverse elements,
- these elements interact selectively and nonlinearly,
- they have a function that they need to perform.

Understanding the dynamical behavior of these systems necessitates the understanding of their interconnections.

An abstract representation of interaction networks and theoretical modeling can give general insights into system-level behavior.

Modeling and experiments

It is extremely important that models of biological networks are based on a synthesis of experimental knowledge about the system.

Input: components; states of components, interactions

Hypotheses: kinetics.

Validation: capture known behavior.

Explore: study cases that are not accessible experimentally
change parameters, change assumptions

Give predictions, gain insights

Overall goal: identify common properties of biological networks
dynamical: high amplification, robustness, adaptability,
topological: redundancy, modularity, conserved regulatory motifs