

Biological network analysis (I) — Basics

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Biological systems are often represented as networks which are complex sets of binary interactions or relations between different entities. Networks are graphs of connected nodes representing different types of relationships between biological entities including genes, proteins, chemical compounds and transcription factors. Every biological entity has interactions with other biological entities, providing us with the opportunity to model biology using many different types of networks. With the data explosion of genome-wide measurements of biological entities and molecular interactions, network analysis is broadly applicable for modeling fundamental cellular processes and elucidating molecular mechanisms of diseases. In this lecture, I will introduce biological networks, review their basic properties, and describe computational approaches for characterizing their topological properties and distilling their modular structure.