Growing systems biology thru communities of practice

Abstract:

The emerging field of systems biology tightly integrates experimental and computational approaches to understand the structure and dynamics of biological systems. Current research focus is on the cell and its subsystems, which are modelled as complex networks of interacting biomolecules. The first part of the talk will discuss questions of modularity of such networks and discuss the closely related concepts of functional modules and network motifs (which are small, recurring subnetworks). Current work on eukaryotic chemotaxis and circadian systems will be discussed as examples.

The experimental and computational challenges of systems biology as well as its potential for medical and life sciences applications mandate an unprecedented level of multi-disciplinarity, which are not easily met by traditional forms of research organization. Several initiatives have started to build "communities of practice"—an approach familiar in particularly knowledge-intensive companies and industries—to try to cope with theses challenges. The second part of the talk will discuss such activities at MIT as well as in the Munich region. The work on chemotaxis and circadian systems discussed previously emerged in the course of the latter two activities.