



Jewish General Hospital
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"Multiscale modeling of biomolecular networks"

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Abstract:

Systems biology aims to build a working model of the cell by first mapping the network of interactions among proteins and other biomolecules in the cell. While highly successful, this network-based view of the cell often treats biomolecules and their interactions as nodes and edges with little atomic details. Such details are important because atomic-level changes in the molecular circuitry, such as those induced by spontaneous mutations, can lead to large differences in cell behavior, as often happens in disease and evolution. Here, I will present recent work on constructing genome-scale structural models of nodes and edges within protein-protein interaction networks, in order to probe design principles of proteins and protein networks at multiple scales. I will show that this multiscale structural systems biology approach provides useful insights into the impact of point mutations and other pathogenic perturbations on proteins and protein networks.