Speaker:
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Title:
Discovery and characterisation of novel functional modules in intrinsically disordered regions

Abstract:
Most higher eukaryotic proteomes contain extensive intrinsically disordered regions. However, the functional role of the vast majority of these regions is unknown. Various estimates have suggested that there may be upwards of one hundred thousand interaction interfaces in these regions. However, to date, only a small portion of the functional elements predicted to reside within these regions have been characterised. The majority of known interfaces in disordered regions belong to a class of compact, degenerate and ex nihilo evolvable interaction modules known as Short, Linear Motifs (SLiMs). We integrate common discriminatory attributes from evolutionary, proteomic and genomic data to discover novel SLiMs, and novel mechanisms regulating the conditional functionality of these motifs. In this talk, we introduce our recent in silico motif discovery work. We discuss recent examples where in silico motif discovery drove the experimental characterisation of novel families of motifs; and the expansion of known families. We introduce web-based tools for motif discovery and the visualisation of the evolution and modularity of intrinsically disordered regions. Together these tools provide a framework to streamline the process of experimental design for biologists studying SLiMs and disordered regions.