

## Systems level analysis of large scale biological data

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**Abstract:** Biological systems are dynamic systems, which have to consistently adapt to the changing environment that they are exposed to. Despite their flexibility in terms of adaptability, they retain the core physiological function and thereby their identity, intact. Recognizing the complex nature of the dynamical behavior of biological systems, last two decades have seen increasingly wider application of inter-disciplinary analytical approaches, combining the powers of mathematic, physics, statistics and computation. The impetus to these approaches was provided by the emergence of high-throughput technologies, which allowed simultaneous measurement of physiological parameters/molecular components at a large scale. This however opened up a new set of challenges, as witnessed by an exponential increase in the data sets generated from the biological experiments. Analyzing these data and inferring biologically useful information from these remains a challenging proposition. In this talk, we will explore, how innovative analytical approaches could help us extract meaningful information from large-scale biological data sets. We have extensively used these approaches to understand cellular responses to diverse stimuli. Moreover these approaches have also allowed us to unravel some fundamental cellular regulatory mechanisms.