Deciphering and modeling gene translation

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Gene translation is a fundamental cellular process by which proteins are synthesized based on the information coded in the genes. Understanding, modeling and engineering this process have both important biotechnological applications and contributions to basic life science. In this talk I survey our multidisciplinary approach for deciphering and modeling the way regulatory aspects of translation are encoded in the gene sequence. Specifically, our approach includes: 1) large scale analyses of genomic data and cellular measurements to identify genomic patterns corresponding to translation regulation; 2) developing computationally efficient models that include the biophysical and stochastic aspects of gene translation; 3) mathematical analyses of various aspects of gene translation; 4) developing algorithms for in-silico engineering of gene translation.
The talk is self-contained and requires no prior knowledge in Biology.