Seminars in Biotechnology BTEC 592 & BTEC 692

"Microbial Community Modeling with Genome Scale Metabolic Models"

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Dr. Muhammed Erkan Karabekmez received his B.S., M.S and Ph.D. degrees from Department of Chemical Engineering at Bogazici University. Then, he worked as a postdoc researcher in a startup company operating in the field of bioinformatics for a year. For the last four years, he has been giving lectures in the Department of Bioengineering and in the Biological Data Science graduate program at Istanbul Medeniyet University and continues his research on bioinformatics, functional genomics, biological networks, systems biology, computational biology, and biological data ethics. He is also the chairman of the "Systems Biology and Bioinformatics Society" in Turkey.

Abstract

Understanding the microbial communities in the gut flora has gained importance in the analysis and understanding of the underlying mechanisms of human diseases. Similarly, it is of great importance to understand the metabolic interactions among microbial communities in the optimisation of processes like biotechnological production, bioremediation, etc. The temporal and economic constraints in experimental studies bring the mathematical modeling studies in these fields to the fore. Simulations of metabolic systems have been carried out for many organisms, thanks to genome-scale metabolic models (GEMs). In the last 10 years, microbial community models using integrated genome-scale metabolic models that can simulate more than one organism in their ecosystem have been rapidly spreading in the literature. Spatial and temporal simulations integrated with different molecular-omic data are rapidly becoming widespread. In this presentation, the background of the field and its current situation will be presented in detail, the projects carried out in this field in our research group will be explained and a projection for the future will be provided.