Seminars in Biotechnology BTEC 592 & BTEC 692

"Giant Workers in Cells: Proteins and Their Specific Dynamic Structures"

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13:30
Online Seminar

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Prof. Dr. Ebru Demet AKDOĞAN received her B.S. and MSc. degrees from the Department of Chemical Engineering, Boğaziçi University. She completed her PhD. at the Polymer Science Institute, in Akron University (Akron, Ohio, U.S.A.). She conducted her post-doctoral research in the Chemical Engineering Department of Carnegie Mellon University (Pittsburgh, PA, U.S.A.) and in the department of Computational Biology at the Genomics Institute of the Novartis Research Foundation. Since 2008, she has been a faculty member in the Department of Molecular Biology and Genetics at Kadir Has University. Dr. Akdoğan's research focuses on the dynamic properties of proteins, protein-protein interactions, allosteric mechanisms, and species-specific drug design.

Abstract

Proteins are long polymeric chains of different types that consist of thousands of atoms and have different functions in cells. While experimental methods can provide only a snapshot of these giant molecules, a Molecular Dynamics (MD) simulation using an atomistic model can record the motion of each atom over time in a computer setting. By introducing a physics-based interaction model, the analysis of a simulation performed on a GPCR (G-Protein Coupled Receptor) protein family will be presented. In the second part of the talk, the allosteric (remote-controlled) feature, which is an important part of protein's dynamic structure will be introduced. How allosteric information can used in drug development studies that will only target bacteria or parasite instead of the host organism will be presented for glycolytic enzymes.