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# Travelling in Time with Proteins: Directed Evolution vs. Ancestral Reconstruction



Tuesday, 26<sup>th</sup> September 2023  
12.00 pm

CIC biomaGUNE - Seminar Room

Protein evolution describes the process by which proteins experience changes in their amino acid sequences over generations. These changes result in the appearance of new protein functions and structures or modifications to existing functions. During the last two decades the appearance of several computational and experimental new techniques have allowed researchers to explore the protein sequence space during their evolutionary process. Today, thanks to complex ancestral sequence reconstruction (ASR) methods we can infer and characterize the sequence of a protein that existed more than 2 billion years ago. Moreover, high-throughput screening methods such as droplet microfluidics enables to speed up the directed evolution of proteins, a process that would otherwise take thousands of years. In this talk I will describe several proteogenic molecules that we have optimized going back or forth in time: Antimicrobial peptides, fluorescent proteins, enzymes and artificial epitopes, among others.

