

Christmas Lecture

December 13 , 2018
12.00 h

Parque Tecnológico de
Bizkaia- Edificio Barco (101)

Aitziber L. Cortajarena

Tailored Proteins: The future of bio-based materials and devices?

Active biocompatible materials and devices are emerging as a new stone corner in multiple sectors including healthcare, energy, lighting, information, computer technology, and environmental monitoring. A variety of bioinspired strategies have recently emerged to develop universal fabrication methodologies to create new functional materials with improved properties and potential uses. Bioinspired materials are capable of recreating processes that occur in Nature, where complex structures emerge from the combination of small components through self-assembly, to exhibit and display a broad variety of functionalities.

Protein engineering can create large arrays of protein-based synthetic building blocks, which significantly facilitate the rational design and assembly of functional biomaterials. Modular building blocks with simple intermolecular interactions allow for better control of the assembly, to obtain different nanomaterials, and even 3D structures by using simple building blocks with well-described intermolecular interactions.

We work on the development of versatile platforms based on simple protein building blocks for the fabrication of multiple protein-based hybrid functional nanostructures and biomaterials. We use protein engineering and bioconjugation methodologies to produce molecular hybrids by combination of protein scaffolds with metals, nanoparticles, nanoclusters, carbon nanomaterials, and/or organic compounds. In particular, we are currently developing nanostructures and materials for applications in molecular electronics, sensing, catalysis, and photoactive systems.