Title of the Abstract: Tissue bioadhesives: a study on recombinant mussel protein Pvfp-5β

Author Name: Radha Santonocito
Affiliation: Institute of Biophysics (IBF), National Research Council (CNR), Palermo, Italy
Country: Italy

Abstract:

Many marine organisms rely on natural adhesives to attach to various surfaces under wet conditions for their life-cycle, movement and self-defense in aqueous tidal environments. Mussel adhesive proteins have received increased attention in recent years for their potential applications in several fields, such as medicine, biomaterials and biotechnology being biocompatible and able to elicit minimal immune response. The Asian green mussel *Perna viridis* secretes several byssal plaque proteins. The Perna viridis foot protein-5β (Pvfp-5β) is the first protein to initiate interaction with the substrate, displacing interfacial water molecules before binding to the surface. Here, we present a study of recombinant Pvfp-5β, in which we established the first recombinant expression in *E. coli* of the protein. We characterized recombinant Pvfp-5β and showed that, despite the circular dichroism spectrum with features of a random coil, the protein is correctly folded as demonstrated by mass spectrometry and nuclear magnetic resonance. We evaluated the cell viability and cell adhesion capacity of Pvfp-5β using NIH-3T3 and HeLa cell lines. Our results revealed that the protein has no cytotoxic effect at the investigated protein concentrations and a good cell adhesion strength on both glass and plastic plates. Overall, we show that the adhesive properties of recombinant Pvfp-5β make it an efficient surface coating material, suitable for biomedical applications including regeneration of damaged tissues.

Biography: Dr. Radha Santonocito has completed her master's degree in Biodiversity and Evolution at the age of 26 years from University of Palermo. She is a research fellow at the Institute of Biophysics (IBF) of the National Research Council of Italy (CNR).

Research Interests: bioadhesives, recombinant proteins, protein production and purification, cell adhesion assays.

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Mail Id: radha.santonocito@pa.ibf.cnr.it

Contact Number: +39 3917788608