Biomimetic adhesives

- Natural adhesives produced by marine organisms are of interest to the biomedical field because of their effectiveness in aqueous environments.
- Generally, marine bioadhesives are functional systems with the purpose of attachment, temporary or permanently, of an organism to a surface. Natural underwater adhesives are able to displace the bound water layer on the surface to which the animal attaches, maintaining a strong and stable bond between the animal and the substrate [1].
- The development of marine bioinspired adhesives needs the understanding of the diversity of molecular mechanisms of marine bioadhesion [2,3].

Protein based adhesives from marine invertebrates

- General characteristics

**Mussel byssus**

- **DOPA**
- **Phosphorilated serine (pSer)**
- **Involvement of sequence motifs**

**Tubes from the reef building tube worms**

- No DOPA detected
- No phosphorylation
- No evidence of repeating sequence motifs
- Apparently no post translational modifications

Barnacles are sessile crustaceans with mineralized plates found in rocky shore environments. They attach permanently to natural and man made substrates by producing an adhesive called cement.

Strong adhesive capable of resist to wave exposure and fluctuations in water temperature and salinity [4].
- The adhesive, a low viscosity fluid, flows through the ducts of the cement apparatus and hardens underwater in contact with the substrate to form a cement that is insoluble in water.

- No DOPA detected
- No phosphorylation
- No evidence of repeating sequence motifs
- Apparently no post translational modifications

Different molecular system of adhesion?

**References:**


**ACKNOWLEDGMENTS:**

This work was partially funded by European Union Transborder Cooperation Programme Interreg España-Portugal 2014-2020 (POCTEP) under projects 0245_IBEROS_1_E and 0302_CVMAR_1_1_P.