

Characterization of matrix proteins of the coralline demosponge *Astrosclera willeyana*, - A contribution to understanding the evolution of biomineralization

Biom mineralization refers to the processes by which organisms form minerals under biological control and organic macromolecules ("organic matrix") are almost always involved in controlling mineralization. Structures formed are often integral and functional parts of the organisms, such as bones, shells, and teeth, some of which show exceptional strength and beauty, often of high commercial value... In the geological record, major animal phyla began biomineralizing in a relatively short time interval in the late Precambrian - early Cambrian, about 550-520 Myrs ago, but it is still unknown whether the formation of biominerals is a homologous process with an underlying conserved physiological machinery or evolved several times independently. In this project we aim to investigate intracrystalline matrices involved in the biocalcification process of the most ancestral calcifying metazoans, coralline demossponges, using the stromatoporoid-grade *Astrosclera 'willeyana'* as a model species. We will first isolate constituent macromolecules by chromatographic or preparative fractionation, and subsequently carry out structural-, functional- and evolutionary analyses involving, among others, immunological/histological methods, molecular cloning polymerase chain reaction experiments. We will also utilize a recently constructed cDNA library to screen for matrix-protein coding genes. Results of this project will provide an evolutionary road map to follow diversification of metazoan biocalcification.