

Biomineralization and Biomimetics: contributions of the *in vitro* approaches

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Bioimperialization is process by which organisms produce minerals. It is widespread in many Fila of all kingdoms and is responsible for the production of a high diversity of minerals associated to many biological tissues and functions. More than 60 different minerals have been described in organisms associated to biomimperialization.

In these seminars we will focus on several aspects of biomimperialization and also on biomimetic approaches to understand the participation of molecules in the nucleation and growth of minerals with specific morphologies and characteristics, in different length sales. Special attention will be given to calcium phosphates, calcium carbonates and iron oxide biomimerals. We will concentrate in 1) bone nanostructure in normal condition or under the effect of drugs; 2) calcium carbonate minerals from calcareous sponges, inner ear otoliths, cell wall of calcareous algae and brown algae; 3) iron oxides in teeth of limpet and chiton mollusks, and magnetic nanocrystals from magnetotactic microorganism.

Main topics:

- Historical and recent studies on Biomimperialization
- Minerals found in organisms and their structures, ultrastructure and methods for analyses (HRTEM, EDS, EELS, FTIR, XRD...)
- Physical-chemical approaches
- Evolution of biomimperializaton
- Interface minerals-organic matter. Molecules associated to biomimerals, their role in the formation of polymorphs and their localization inside biomimerals.
- Biologically induced and biologically controlled mineralization.
- Amorphous and crystalline precursors of biomimerals
- Biomimperialization of calcium carbonates, calcium Phosphates and iron oxydes.
- Histological aspects of calciu phosphate and calcium carbonate biomimerals
- Biomimetical approaches for understanding /reproducing *in vivo* mineralized structures
- Examples of vetro assays related t carbonaceous biomimerals.

Time: 20, 21, 27 June 2018 from 10:00 to 12:00 and from 13:30 to 15:30

Place : Auditorium, IPCMS, 23 rue du Loess, Strasbourg