



HAL
open science

Deciphering the Role of Organic Matter in the Biomineralization Process of Marine Sponge Spicules: A Solid-State NMR Investigation

Sylvie Masse, Guillaume P. Laurent, Thibaud Coradin, Andrzej Pisera

► **To cite this version:**

Sylvie Masse, Guillaume P. Laurent, Thibaud Coradin, Andrzej Pisera. Deciphering the Role of Organic Matter in the Biomineralization Process of Marine Sponge Spicules: A Solid-State NMR Investigation. BIOMIN XVII: 17th International Symposium on Biomineralization, Aug 2023, Saint-Etienne (FR), France. . hal-04259024

HAL Id: hal-04259024

<https://hal.sorbonne-universite.fr/hal-04259024>

Submitted on 25 Oct 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

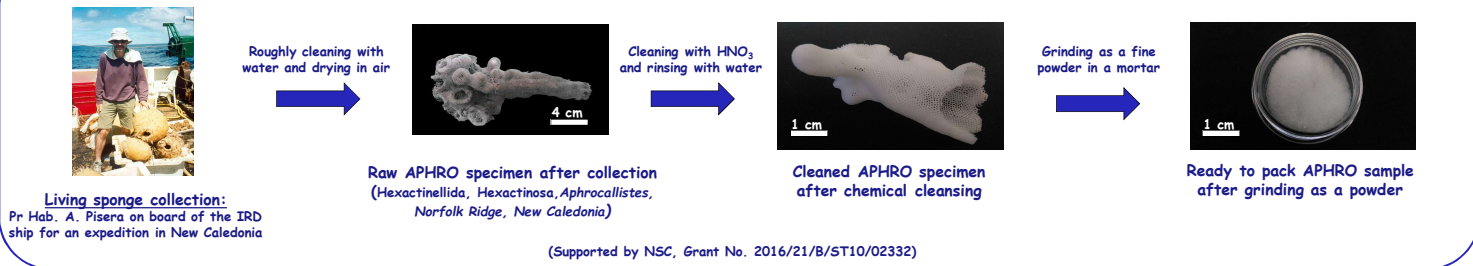
Deciphering the Role of Organic Matter in the Biomineralization Process of Marine Sponge Spicules: A Solid-State NMR Investigation

Sylvie MASSE¹, Guillaume LAURENT¹, Thibaud CORADIN¹ and Andrzej PISERA²

1. Laboratoire de Chimie de la Matière Condensée de Paris, Sorbonne Université, CNRS, Paris, France
2. Institute of Paleobiology, Polish Academy of Sciences, Warsaw, Poland



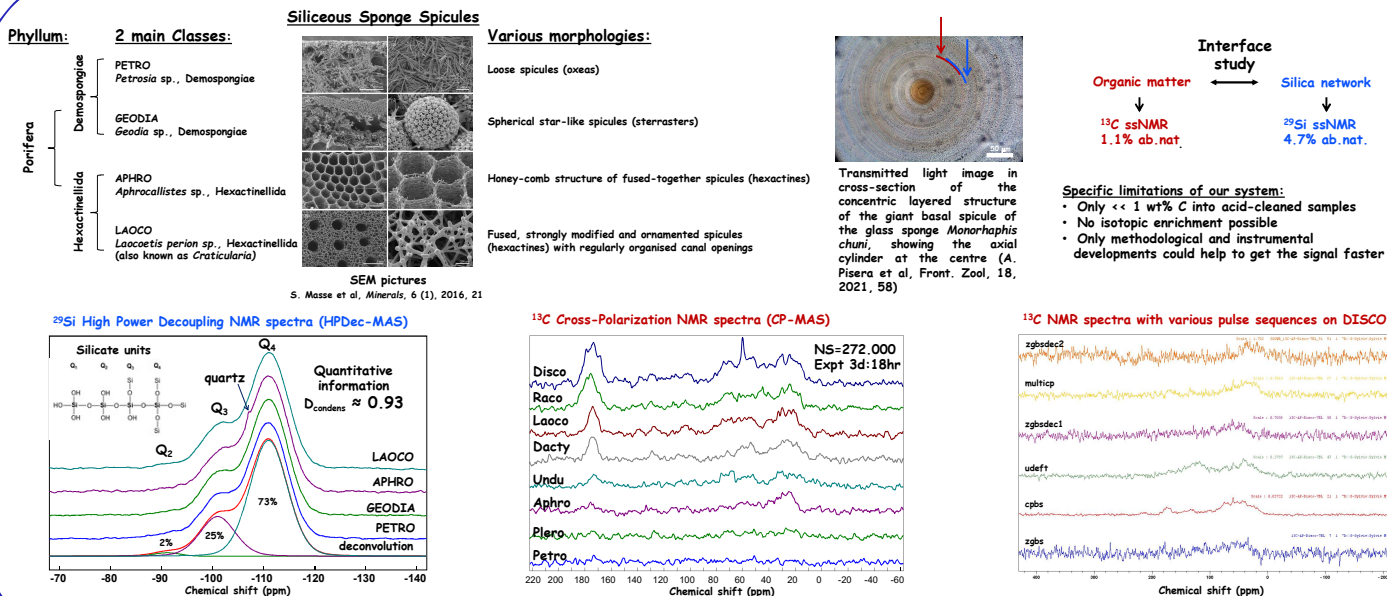
1 - Materials Preparation



2 - Solid-State NMR Spectroscopy



3 - Materials Characterization



4 - Conclusion and Outlook

- Sponge spicules are biocomposite materials composed of a siliceous skeleton embedded in an organic matrix
- Inner skeleton is of various shapes depending on the taxon, but surprisingly ^{29}Si HPDec ssNMR signature is quite ever the same and a condensation degree of ca. 0.93 is usually observed
- ^{13}C CP-MAS ssNMR should be more promising to discriminate the samples but due to the low abundance of ^{13}C and low content of carbon into the cleaned samples, the signal is too poor to get detailed assignment and to explore the organic-mineral interface through 2D heterocorrelation NMR mapping
- Dynamic Nuclear Polarization (DNP-enhanced ssNMR) should be a helpful technique to go further in the comprehension of the biomineralization process of sponges