

## **Project 4.6. Properties and interactions of intrinsically disordered proteins involved in biomineralization (experimental)**

**Supervisor:** dr hab. Anna Niedźwiecka

**Institute:** IFPAN

**Unit:** SL-4

**WWW:** <http://www.ifpan.edu.pl/SL-4/index.php?group=niedzwiecka>

### **Background:**

Interactions and structural dynamics of biomolecules.

### **Aim:**

The objective of the proposed research project is to significantly improve current understanding - at the molecular level - of the structural dynamics and interactions of intrinsically disordered proteins (IDPs) involved in the phenomenon of biomineralization. The research objects will cover coral acid-rich proteins (CARPs) of skeletal organic matrix. They are large biopolymers with a high negative charge. Their structural dynamics is inherently linked with their biological function. Up to this time, only four of them have been cloned. The main task of the project is to obtain new CARPs and characterize their properties and interactions with  $\text{Ca}^{++}$  ions in solution at early stages of calcium carbonate crystal nucleation and growth using methods of molecular biophysics, especially single molecule microscopic experiments.

### **Requirements:**

- MSc degree in biophysics or physics or chemistry or biology to be obtained not later than 30 September 2021;
- high grades in exams both in physics and biology after completing courses at the academic level;
- knowledge and practical experience with laboratory techniques of molecular spectroscopy;
- practical experience in protein expression and purification;
- deep interest in molecular biophysics, diligence at laboratory work, scientific communication skills, ability to work in an interdisciplinary group;
- sufficient proficiency in English for reading and writing scientific papers.

### **Funding:**

Scholarship: grant funding of 3000 PLN per month, before subtracting obligatory employer and employee social security contributions (~15%), for 24 months. Afterwards, standard Polish PhD scholarship (about 3240 PLN/month net in years 3-4).

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