

## Project 2.4 Peptide-based luminescent coordination capsules and cages

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**Unit:** Group IX

**www:** <https://ww2.icho.edu.pl/z09/>

### Background:

Tasks: Synthesis of building blocks and complexation experiments, interpretation of spectral data, preparation of data for the publication process.

### Aim:

In this project, we plan to synthesize capsules that combine unique features: chirality, presence of metal centers, ability to emit light, and functionality originating from using natural building blocks (peptides). Peptides are natural building blocks with their functions already pre-programmed, they are also available, modular, and inherently chiral. However, they have several disadvantages that make them particularly difficult building blocks, therefore, there are only a few examples of their use in the construction of chiral coordination capsules. The project plans to obtain molecules that can overcome these difficulties. (1) We plan to use multidentate rigid coordination sites that will suppress the competition from other possible coordination places. (2) We will induce chirality centers on metals, that will enhance chiral properties and create chiral emitters. (3) We will introduce luminescent “antenna-type fragments” that will transfer the energy to metal centers to obtain CPL-active materials. With the set of new capsules, we will test their properties towards binding and recognition of various chiral guests, their adaptability towards various environments (amphiphilic-type), and their ability to generate selective chiroptical signals (ECD and CPL).

### Requirements:

- MSc degree in chemistry, pharmacy, biotechnology, or physics,
- positive result of an interview to the Doctoral School (Warsaw4PhD),
- basic experience in organic synthesis and interpretation of spectral data,
- good communication skills in English.