Scholarship for PhD student in the OPUS project

Tautomerism-coupled subcomponents self-assembly – a new tool for the construction of stimuli-responsive molecular capsules

The subcomponent self-assembly is a synthetic methodology employing the formation of covalent (C=N) and coordinative (C=N→M) bonds to generate complex supramolecular architectures in multicomponent reactions. Its advantages over classical synthesis rely on exploiting dynamic covalent reactions, offering the error-checking-fixing mechanism of thermodynamically-controlled processes. Using self-assembly allows the building of extensive metallosupramolecular architectures such as helicates, mechanically interlocked molecules, and functional capsules from simple organic building blocks and metals. Metal-organic cages are three-dimensional molecules with well-defined cavities, demonstrating intriguing features and applications in separating small molecules, sensing, drug delivery, and anion transport. They allowed for the reactive species entrapment and remarkable catalytic transformations. The project's primary objective is to develop a novel variant of self-assembly, i.e., tautomerism-coupled subcomponent self-assembly. Exploiting this synthetic methodology will allow for the creation of remarkable pyrrole-based capsules with exciting functions, adapting their cavities to the requirements of guest molecules.

Principal Investigator: Bartosz Szyszko
Organic Supramolecular Chemistry Group (www.bszyszko.pl)
Faculty of Chemistry, University of Wrocław, Poland

Requirements:
1. A diploma or certificate of completion of a master's degree in chemistry
2. Admission to Doctoral School at the University of Wroclaw
2. Experience in organic synthesis
3. Experience in self-assembly
4. Experience in analytical techniques: NMR, UV-Vis, mass spectrometry

Salary/Scholarship: 12 months
– PLN 5000 per month

Please apply by sending your CV and cover letter to bartosz.szyszko@uwr.edu.pl. Deadline: 2024-09-30 00:01

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