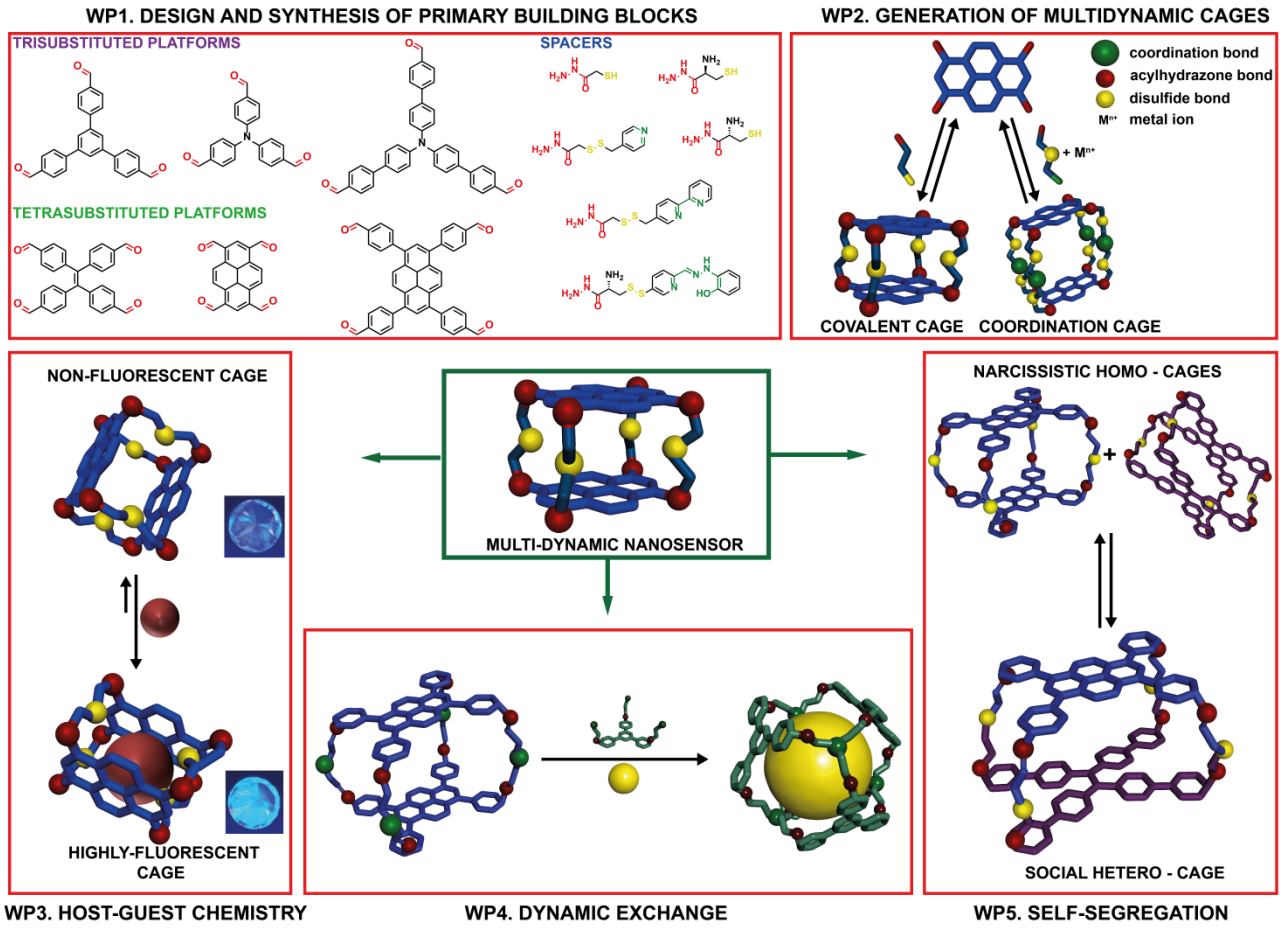
1. Objectives of the project

The Project entitled: „Multi-Stimuli-Dynamic Self-Assembled Molecular and Supramolecular Nanosensors” aims to generate organic cages, containing multiple reversible linkages in their structure both covalent and coordination, capable of encapsulating the guest molecule within internal cavity. In addition, their adaptability will be determined due to the reversible processes of creating / decomposing / exchanging components, possible due to the presence of dynamic connections between cage components. Moreover the use of building blocks with fluorescent properties will undeniably increase their application potential, as they can be exploited as modern, multi-functional nanosensors.

2. Research to be carried out

The initial stage of the project involves a multi-stage synthesis of poly-aromatic functionalized aromatic blocks and flexible organic connectors, which in the further part of the project, as a result of generating reversible bonds between them (covalent and coordinative), will create multi-dynamic fluorescent cages. Obtained architectures will be characterized by a number of analytical techniques. In a further step cages will be carefully examined for the encapsulation of biologically active molecules, including chemical warfare agent simulants. Additionally, due to the presence of reversible bonds, the dynamic properties of the obtained systems will be investigated, taking into account such processes as self-segregation and the component exchange.



3. Reason for choosing the research topic

The transport and release of biologically active substances is extremely important from the medical point of view, because it allows delivery of the drug directly to sick and infected cells. These processes are extremely complex and research on better and better carriers is ongoing. While the vast majority of accessible molecular “containers” exploit one reversible bond, proposed project involves up to three divers dynamic connection within structure o cage. This ensures a multilevel response to external stimuli, thus increasing the possibility of both transport and release of the guest (drug) molecule.