

## **Project 2.2. Synthesis of non-planar heterocyclic nanographenes via CH-activation**

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**Institute:** Institute of Organic Chemistry, Polish Academy of Sciences

**Unit:** Group 10

**WWW:** <https://www.icho.edu.pl/>, [https://ww2.icho.edu.pl/DTG\\_group/](https://ww2.icho.edu.pl/DTG_group/)

### **Background:**

Polycyclic aromatic hydrocarbons (PAHs) are important molecules with expanding applications as optoelectronic materials, commonly obtained via cross-couplings of prefunctionalized building blocks. Accordingly, C-H functionalization could offer unprecedented tools for the synthesis of hardly studied, appealing PAHs such as perylene and corannulene incorporating heteroatoms or corannulene featuring axial chirality. Indeed, the presence of axially chiral motifs on PAHs could drastically impact their physical properties providing them yet unexplored properties.

### **Aim:**

Synthesis of perylene and corannulene analogs with incorporated heteroatoms will be targeted via direct arylation, radical-anions coupling and Scholl reaction. PhD-student will perform in-depth optimizations to determine the steric/electronic factors governing these reactions. In parallel, physicochemical characterization of the new materials will allow subsequent rational design of advanced PAHs. PhD-student will further explore different strategies to build up perylene & corannulenes analogs via C-H arylation focusing mainly on intramolecular transformations (design of simple-linked precursors); synthetic routes such as radical-anion coupling, nucleophile-electrophile addition and Scholl reaction will be explored; 2) elucidate electronic requirements for dehydrogenative fusion; 3) investigate the optical properties of synthesized PAHs.

### **Requirements:**

MSc in chemistry, specialization – organic chemistry. Good knowledge of English.

Additional requirement:

In principle researchers must not be nationals of Poland.[1] Additionally, at the start of their fellowship/activity, researchers may not have resided or carried out their main activity (work, studies, etc) in Poland for more than 12 months in the 3 years immediately prior to the start date.

[1] Researchers who are nationals of Poland, will be considered as being eligible to benefit from a training or mobility action, if they can provide evidence that they have legally resided and have had their principal activity (work, studies, etc) in a third country for at least four of the last five years immediately prior to the start date.