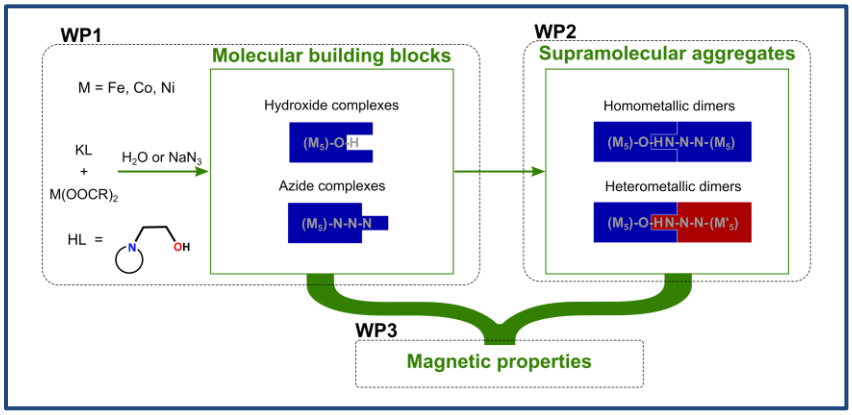
Towards novel supramolecular magnetic materials based on self-organization of molecular late transition metal complexes *via* hydrogen bonds

The molecular magnetism is a relatively young discipline, which was formed in the 90s of the XXth century and since these days has been incessantly thriving. It concerns the synthesis and characterization of well-defined magnetic materials with the molecular origin of magnetic properties, which allow for exploration of interesting phenomena on the border between classical and quantum physics. The search for new model compounds, which may exhibit interesting magnetic behavior and may contribute to the more in deep understanding of magnetism constantly attracts a lot of attention of scientists.

The proposed project is based on thoroughly enjoyable experience of my home research group in both coordination and supramolecular chemistry derived from the design, synthesis, self-assembly and characterization of various mono- and multinuclear metal complexes incorporating multifunctional ligands. Based on my preliminary works I plan to synthesize new homometallic pentanuclear late transition metal (M = Fe, Co, Ni) complexes containing terminal OH or N_3 groups and stabilized by deprotonated N-(2-hydroxyethyl) heterocyclic amines. Afterwards, I utilize its propensity to the self-organization *via* OH···N_3 hydrogen bonds for construction of novel supramolecular aggregates. The resulted molecular and supramolecular systems may exhibit interesting magnetic behaviors and studies on magnetic interactions in the resulted systems will be integral part of the project.



The proposed project may pave the way for new family of magnetic compounds, which may be promising novel model systems of weakly coupled qbits. Moreover, the planned research will certainly significantly contribute to a more in deep understanding of molecular self-assembly processes and magnetic interactions in molecular and supramolecular systems.