DESCRIPTION FOR THE GENERAL PUBLIC (IN ENGLISH)

In recent years, we observe rapid development of chemistry and technology of polymer materials accelerated by rapid progress in many areas of our lives from manufacturing of polymeric goods to the dedicated biocompatible medicinal devices. Synthetic polymers, biopolymers and their modified derivatives are widely used in medicine and pharmacy. Of the particular interest are polymers used in the technology of controlled drug-release systems or as carriers for targeted drugs. However, a very important area of current research is modern stereoselective synthesis and chirotechnology involving catalytic asymmetric transformation, efficient separation of racemic mixtures and detection of chiral compounds.

The main objective of the project is selective and controlled synthesis of novel polymeric materials with a well-defined structure based on norbornenimides, siloxanes and linear cinchona alkaloid polymers. These polymers and material will be prepared by using well-establish and efficient methods including 'click' chemistry, ROMP reaction as well as platinium-catalyzed hydrosilylation. Several different polymeric architecture is considered for preparation covering e.g. 'matrix-side group', 'core-side group' and 'matrix-brush group'. All product are intended to be decorated by chiral molecules (predominantly Cinchona alkaloids) as carriers of desired properties.

The use of inorganic-organic systems will increase durability, thermal stability, chemical resistance and forming helical spiral thermodynamically stable. Proposed macromolecular products are likely to allow for the transition from homogeneous to heterogeneous catalysis and ultimately to carry out catalytic transformations with simple reuse or isolation of material from reaction.