Chiral cyclic imines as building blocks in the synthesis of izidines

The main achievement of the dissertation is to demonstrate that cyclic imines can be used as a building block in the synthesis of izidines, that are a large class of natural occurring alkaloids, witch exhibit various biological activities.

The first task of the investigation was to elaborate simple method of synthesis of cyclic imines. We have found that the reduction of sugar-derived lactams to the corresponding cyclic imines can be conveniently achieved using $Cp_2Zr(H)Cl$. The imines received can be used directly for further transformations without their isolation and purification. A direct addition of nucleophiles to the in situ generated cyclic imines provides opportunity for the synthesis of variety of polyhydroxylated pyrrolidines and piperidines.

Utility of cyclic imines was confirmed in investigation of Mannich/Michael tandem reaction as method of polyhydroxylated indolizidines and quinolizidines synthesis.

The developed methodology has been also used successfully apply in the multicomponent Ugi reaction leading to the sugar peptidomimetics.