Identification of new, catalytic methods for the C-C bond forming reactions is one of the most fundamental tasks in the contemporary organic chemistry. Catalysis employing chiral organic catalysts with strictly defined spatial arrangements of substituents is of particular significance. This approach to organic synthesis is receiving increasing attention from the chemical society. Notably, in such a setup the catalyst plays a dual role. Firstly, it activates the starting material enabling the reaction to proceed under mild conditions. Secondly, it provides a well-defined chiral environment enabling the reaction to proceed in a stereocontrolled fashion. Cascade reactions, constituting important part of contemporary organocatalysis, can be defined as chemical transformation consisting of more than one bond-forming event taking place in a tandem manner. Notably, the consecutive bond-forming/breaking processes are a consequence of a presence of functional groups introduced in the preceding steps. Such an approach to organic synthesis has many benefits. It reduces time and effort necessary to access the product, as all reactions are performed in a one reaction vessel without the necessity to isolate and purify of reaction intermediates. Notably, stereocontrolled synthesis of biologically relevant molecules, natural products and their analogs is an important goal of the modern synthetic and medicinal chemistry. The proposed research project deals with the development of novel organocatalytic cascade reactions in which decarboxylative elimination constitutes a key transformation. Such a concept should create a library of decarboxylative cascade reactions offering access to a wide variety of structurally and stereochemically complex products. Main benefits of these methodologies are related to their general character, operational simplicity and broad applicability. Furthermore, in the project new groups of substrates, never before employed in the field of asymmetric organocatalysis will be used. Based on these new synthetic methodologies, studies leading to biologically relevant compounds and natural products will be undertaken. Notably, the new organocatalytic methodologies described in the project have not been previously investigated. For this reason, the results obtained possess all necessary elements of scientific novelty. It is worth to stress out that catalytic technologies save energy and reduce the waste generation, time and costs required to access desired products. Therefore, such an approach to chemical synthesis is highly beneficial to the society and constitutes one of the most important scientific challenges in the 21st Century.