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Synthesis of bicyclic lactams by Ugi reaction and ring closing metathesis

In this thesis a new method for the synthesis of bicyclic lactams is developed. The Ugi-3-component-4-centre reaction was employed for the synthesis of a monocyclic lactam. The second ring was built by ring closing metathesis.
Bicyclic lactams can be used as building blocks for peptide mimetics. They induce a turn in the peptide chain. The method developed in this work offers the possibility to build bicyclic lactams in only two synthetic steps, which already contain functional groups as links to peptide chains. Former methods required additional functionalization.
The Ugi-3-component-4-centre reaction is a very powerful reaction. In only one step, highly substituted lactams can be synthesized. When terminal olefins are used as substituents, the generated lactams can directly be utilized in ring closing metathesis to yield bicyclic lactams.
During the last years the Ugi-3-component-4-centre reaction was described in literature only in a few works. Not much is known about substrates and stereoselectivity of this reaction. So it was necessary to evaluate the reaction by a series of test reactions. It could be shown that the use of olefinic components is possible without any problems. When chiral components are used, no diastereoselectivity could be observed.