Ring Expansion Approaches for the Synthesis of Functionalised Macrocycles

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This talk concerns the development of two ring enlargement new way to construct functionalised macrocycles (12+ membered rings) and medium-sized rings (8-11-membered). These ring systems are usually difficult to make, with one of the key challenges being the effective control of intra- and intermolecular reaction during end-to-end cyclisation.^[1,2] Both approaches I will discuss in this talk are based on strategies by which the difficult end-to-end cyclisation step can be completely avoided. First, I will describe an iterative ring enlargement approach known as 'Successive Ring Expansion' (SuRE).^[3-6] SuRE works be enabling the controlled insertion of amino hydroxy acid fragments into ring enlarged products via acid and а telescoped acylation/rearrangement reaction sequence. Background, methods development, substrate scope/limitations, the synthesis of compound libraries for biological evaluation^[4] and DFT calculations^[7] will all be covered. Second, a new ring expansion cascade strategy^[8,9] will be introduced, that enables the atroposelective synthesis of medium sized rings directly from linear precursors.^[10]



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