SUMMARY OF THE RESEARCH WORK FROM OUR HANNOVER LABORATORY

Our efforts aiming at different classes of alkaloids or heterocyclic natural products were generally accompanied by related investigations on the development or improvement of synthetic methods.
In connection with the total synthesis of various indole-alkaloids like ajmalicin, formosanin, akuammicin, tetrahydroalstonin, roxburghin, geissoschizin, eburnamonin and vincamin, we for instance prepared a series of adducts from methyl-acetylendicarboxylate and selected nucleophiles, as for instance amines and isonitriles.
In the course of a biomimetic total synthesis of camptothecin, autoxydation-reactions and DIBAH-reductions were studied.
Similarly our work leading to a synthesis of the macrolide brefeldin A as well as hydroazulenes and prostacyclins triggered extensive studies on regioselective and stereoselective transformations of cyclopentenones, while our synthetic route to acronycin benefited strongly from our experiences with hetero-cope-rearrangements.

The spiro-structure of histrinonicotoxin called for detailed investigations of spirocyclisation reactions with aminoketones and for our efforts to prepare biological active analogues of cephalostatins we had to develop practical routes to non-symmetric pyrazines.
Finally the decision to approach both absolute configurations of enantiopure synthetic building blocks by chiral discrimination of enantiotopic double bonds in cycloaddition reactions with taylor-made optical active dienes, called for the enantioselective preparation of these compounds.
They were indeed obtained from different sources and when ergosterol-type dienes where employed in this endeavour, we arrived at novel ansa-steroids via a unique retro-diels-alder process that opened rings A, B and C of the steroid-system.

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