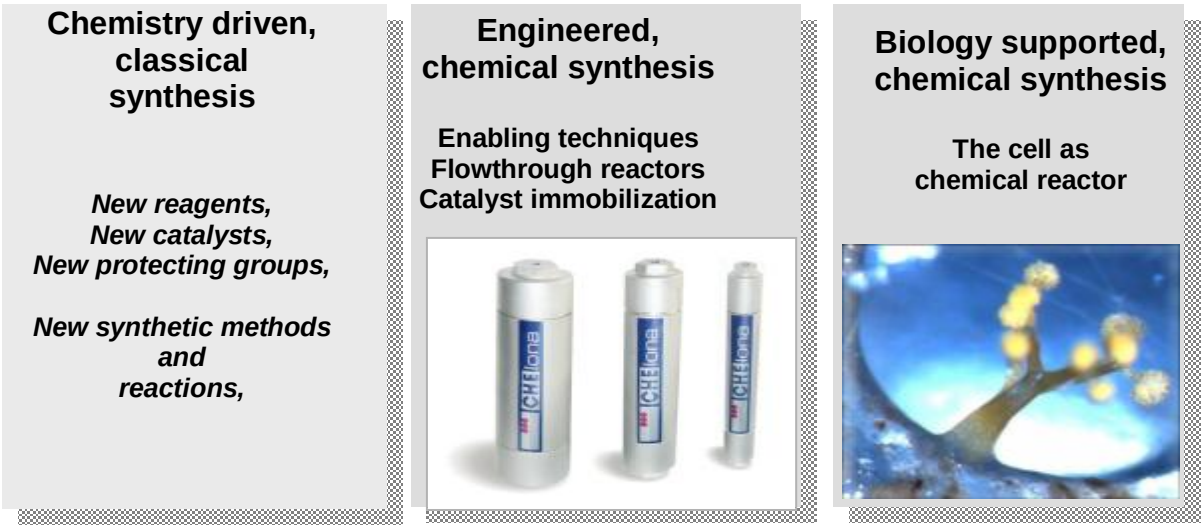
Expanding the Frontiers of Organic Synthesis by Engineered and Biology-Based Concepts

Andreas Kirschning
Institute of Organic Chemistry, Leibniz University Hannover, Schneiderberg 1B, 30167 Hannover, Germany

The key role of **Chemistry** is still the chemical alteration and manipulation of molecules and materials. This feature of chemistry is commonly termed synthesis. Currently, it becomes evident that organic synthesis is expanding its tool box by implementing technologies from neighbouring fields such as engineering and biology into its portfolio. Typical examples are the use of enabling techniques such as microwave assistance and new reactor designs as well as molecular biology and engineered organisms.

The report will briefly cover both aspects disclosing recent work from our laboratories.



A. Flow concepts with immobilized catalysts.
In this report a novel microreactor (PASSflow reactor) is presented which is constructed as a flow-through system. The reactor system consists of a "hardware", the column itself. It contains a chemical "software" which is a porous, monolithic glass/polymer composite, preferentially loaded with immobilized homogeneous catalysts and enzymes. It can be operated like a HPLC-system.

B. Mutasynthesis

In the context of antitumor active natural products, ansamitocin P-3, as well as geldanamycin are already mature compounds. In preclinical studies AP3 inhibited growth of different leucemia cell lines as well as human solid tumors at very low concentrations (10^{-3} to 10^{-7} µg/ml) but failed in phase II. However, given the high intrinsic potency of the class of natural products, we initiated a programme to access new derivatives of ansamitocin P-3 by mutasynthesis using bioengineered microorgansms.