The miniaturization of (bio)chemical processes onto lab-on-a-chip devices is an emerging interdisciplinary technology. The workgroup headed by Prof. Dr. D. Belder is engaged in the development and application of microfluidic chip technology in various fields of chemistry, sensing and bioanalytics. The groups research is focussed on the exploration of microfluidic enabling technologies, ranging from the manufacturing of chip prototypes and the development of analytical systems to the realization of various applications in life sciences. Microfluidic devices are in the focus of basic research and instrumental development for applications in areas such as (bio)chemical sensing, multiphase droplet flows, (bio-)chemical synthesis and for miniaturized analytical separation techniques like chip chromatography or chip-based electrophoresis. Besides such contributions a further main research field is the development of methods for high sensitivity detection in microfluidic systems. For this purpose new detection approaches based on Raman spectroscopy, mass spectrometry and time-resolved fluorescence with one or multiphoton excitation are realized.