We apply a combined analytic and synthetic approach to understand and engineer signalling pathways which govern fundamental immunologic processes or determine cell fate and function or represent the molecular basis of diseases.

The strong connection of signalling research with the rapidly emerging discipline of synthetic biology represents a unique feature of Freiburg as exemplified by the establishment of the Clusters of Excellence BIOSS (Centre for Biological Signalling Studies) and CIBSS (Centre for Integrative Biological Signalling Studies). In addition, our members are associated with several collaborative research centers such as:

"Signal Pathways to the Cytoskeleton and Bacterial Pathogenesis" SPP1150

"Functional Specificity by Coupling and Modification of Proteins" SFB 746

As analytical signalling science and synthetic biology represent universal approaches to understand and engineer biological processes, our members have a broad interdisciplinary background involving immunology, medicine, microbiology, cell biology and botany on the one hand as well as physics and modeling on the other.

The members are affiliated at the different research institutions of the University, the Max Planck Institute of Immunobiology and Epigenetics as well as the University Hospital. This broad range of disciplines and affiliations offers the PhD students insight into multiple research topics, the familiarization with a broad palette of experimental techniques as well as direct access to partners with complementary background for advice.

To know more on the background and affiliations of the participating members click here
Using Synthetic Biology and Signalling

Credit: Hannes Beyer

Spatially controlled high-speed transgene expression using an SGBM photomask for illumination of mammalian cells.