

UniSysCat Colloquium

Prof. Dr. Alexander Deiters

University of Pittsburgh

Start Time: Wednesday, September 25, 2019 05:15 pm

End Time: Wednesday, September 25, 2019 06:45 pm

Chemistry Building, C 264

Technische Universität Berlin, Straße des 17. Juni 115, 10623 Berlin

Chemical and Optical Control of Biological Processes in Cells and Animals

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Nature regulates biological processes, such as signal transduction, protein function, and gene expression, with high spatial and temporal precision. In order to study and understand these processes, equally precise external control is required. Light is an excellent tool for this purpose, as it can be easily regulated in timing, location, wavelength, and amplitude, thereby enabling high-resolution control of biological processes. We are developing chemical switches to A) control protein function through genetic code expansion with unnatural amino acids that can be activated with light and small molecules, and to B) control nucleic acid function through synthetic installation of light-cleavable chromophores onto nucleobases and into phosphodiester backbones. We have applied these approaches to the conditional control of DNA recombination, gene editing, RNA polymerization, RNA translation, microRNA function, cell signaling, and other essential biological processes in cells and zebrafish embryos, and select examples of these applications will be presented.

Prof. Dr. Martin Oestreich (TU Berlin)

Organizer