



**Prof. Seraphine Wegner**

**Title:**

Spatiotemporal control in synthetic and natural cells using light

**Abstract:**

Many functions in cells arise directly from the spatial and temporal regulation of cell-matrix and cell-cell interactions. In this talk, I will present strategies of how such spatiotemporal control over adhesions of synthetic and natural cells can be achieved with visible light (blue, green or red light) and functions that arise from these. These light triggered and reversible interactions mimic the dynamics of interactions observed in biology, and allow modulating the interactions as desired without disturbing other processes in the cell. The photoswitchable adhesions allow us to self-assemble and self-sort cells into multicellular functional architectures with high precision, regulate their interactions with synthetic materials, program cell to cell communication and to study the underlying biology. Synthetic minimal cells, which reduce complexity and yet capture key features of natural cells, allow us to quantify and correlate cell behavior with molecular information. Further, complementary approaches pursued with synthetic minimal cells as well as bacterial and mammalian cells allow translating concepts between different systems and integration into hybrid structures. Overall, our work on one hand provides insight into underlying design principles of life and on the other hand allows addressing questions in cell biology as well as engineer new synthetic cell biology.

**Biography:**

Prof. Seraphine Wegner is a full professor at the Institute of Physiological Chemistry and Pathobiochemistry at the University of Münster, Germany. She obtained her bachelor in chemistry in 2005 at the Middle East Technical University, Ankara, Turkey and her PhD in chemistry in 2010 at the University of Chicago, USA. In 2011, she started as an Alexander von Humboldt postdoctoral researcher under the guidance of Prof. Joachim Spatz at the University of Heidelberg and Max Planck Institute for Intelligent Systems, Germany. In 2016, she started her independent research group at the Max Planck Institute for Polymer Research, Germany, which is part of MaxSynBio, the network for bottom-up synthetic biology of the Max Planck Society. She has been awarded several prestigious prizes such Eliteprogramm Fellowship of the Baden-Württemberg Foundation (2014), the Fellowship of the Daimler und Benz Foundation (2016) and the ERC Starting Grant (2017).