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Assembly of supramolecular frameworks for 3D bioprinting

Initiative: Integration molekularer Komponenten in funktionale makroskopische Systeme (beendet, nur noch

Fortsetzungsanträge)

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Laufzeit: 3 Jahre

As macroscopic systems, cells exhibit biochemical properties that are heavily influenced by the surrounding extracellular matrix. The project aims at rewiring living cells by in-situ lateral organization of membrane receptors and thus exert control over signaling networks by light. Wavelength-selective as well as two-photon photoactivatable supramolecular interaction pairs will be developed to direct receptor clustering with high spatiotemporal resolution. The one- and two-photon activation will facilitate a non-invasive protein organization in 2D and 3D. Combined with superresolution microscopy and single-molecule imaging, the multi-photon patterning will provide valuable insights into suprastructures of receptors and their impact on cell response. The approach will ultimately allow to control receptor clustering in a macroscopic 3D cell culture at system-level.

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