

Living Foams - a route towards artificial tissue

Initiative: "Leben?" - Ein neuer Blick der Naturwissenschaften auf die grundlegenden Prinzipien des Lebens

(beendet)

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The main objective of this proposal is to realize a bottom-up strategy for tailored artificial tissue - a living foam - using multifunctional minimal cell compartments (MCCs) based on giant liposomes or polymersomes as fundamental building blocks. The living foam is characterized by dedicated molecular contacts between the compartments serving as cell-cell contact mimics comprising artificial gap junctions and artificial adherens junctions. The junctions permit to generate an interconnected communication network of MCCs that relay chemical and mechanical signals. Eventually, this design scheme will allow us to form actively driven foams in 3-D that resemble tissues in various ways. The foam will also allow replacing a fraction of living cells in native tissue to form hybrid structures either to substitute or to supply new properties paving the way towards a revolution in tissue engineering in the context of wound healing, contractile tissue, skin ageing and relaying signals for unperturbed bone development.

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Open Access-Publikationen

HAV-Peptides Attached to Colloidal Probes Faithfully Detect E-Cadherins Displayed on Living Cells.

pH-Triggered Assembly of Endomembrane Multicompartment in Synthetic Cells

Flagellum-Driven Cargoes: Influence of Cargo Size and the Flagellum-Cargo Attachment Geometry