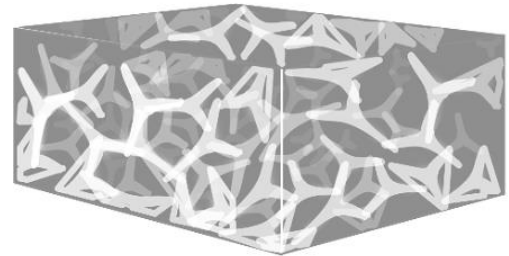


Opportunities for collaboration

CHANNELMAT wants to take the next step and is looking for:

- infrastructure and know-how of research-oriented companies
- development of marketable concepts for novel products
- knowledge-transfer into already existing products

CHANNELMAT



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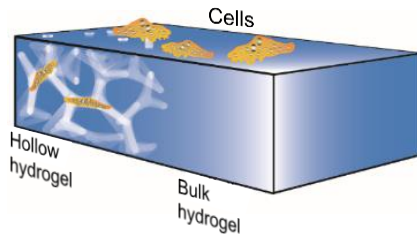
Faculty of Engineering

Novel microstructured 3D hydrogels

- **Interconnected microchannels**
- **Channels of subcellular size**
- **Optimal environment for cells**

The Motivation

Materials providing a large cell-material contact area and well-defined mechanical properties are excellent for controlling cells by mechanotransduction. Porous hydrogels provide such a solution.



Hydrogel requirements:

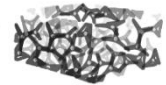
- to create an environment, which is favorable for cell growth.
- to increase the contact area between cells and their surrounding environment to optimize mechanotransduction.

The Invention

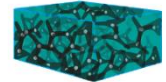
The innovative 3D biomaterial serves as a platform for controlling mechanotransduction by mimicking natural 3D cellular environments. It contains a novel form of microporous structures represented by micron-sized channels embedded in a hydrogel matrix of a well-defined stiffness.

The Production Process

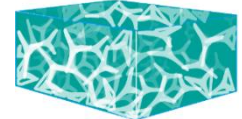
Sacrificial template with micron-sized zinc oxide tetrapods in defined density and size



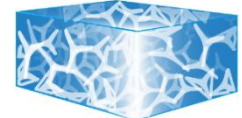
Embedded zinc oxide template in hydrogel



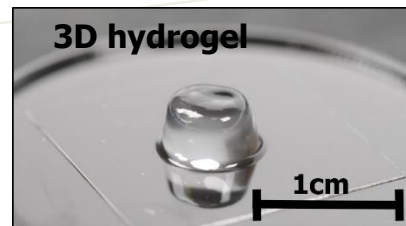
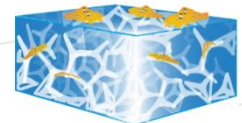
Hydrolysis of zinc oxide



Hydrogel swelling and washing



3D hydrogel with inter-connected microchannels ready for cell experiments



The Application

The specific structure and size distribution of micro-channels in the 3D hydrogel can be used to decontaminate e.g. contact lense cases and water reservoirs from pathogens such as *Acanthamoeba castellanii*.