



Special Lecture :

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„(Bio)artificial organs to mimic and / or replace patient failing organs“

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Institute for Multiphase Processes

Callinstrasse 36, 2nd floor, Room 226, 14:00 s.t.



Abstract

In the coming years, due to the aging of the population and the low availability of donor organs there will be urgent need for bioengineered organs to assist, mimic or replace failing patient organs. The developed organs could be:

Artificial: based on new biomaterials and novel designs, to assist or mimic a patient organ. Typical examples are: (i) new generation of artificial kidney devices for better and more continuous patient treatment (ii) new artificial liver devices for blood detoxification using novel sorbents.

Bioartificial: combining biomaterials and biological cells to assist, mimic or fully replace failing patient organs. Typical examples are: (i) bioartificial kidney devices, combining biomaterials and kidney epithelial cells for improved blood detoxification (ii) bioartificial pancreas devices, where encapsulation of pancreatic cells is utilized for the treatment of diabetes type 1 (iii) bioartificial lungs for studying lung regeneration.

In this research, the challenges (scientific and technological) are big. There is need for new biomaterials, need for better understanding and tailoring of the biomaterial – cell / tissue interaction, better immune protection and mass transfer, as well as, development of new concepts and designs.

In this talk, I will focus on our latest work on the development of (bio) artificial kidney and bioartificial pancreas devices for the treatment of kidney disease and diabetes, respectively.