

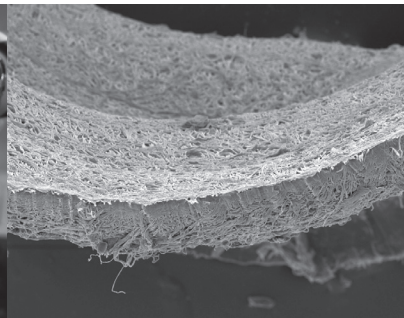
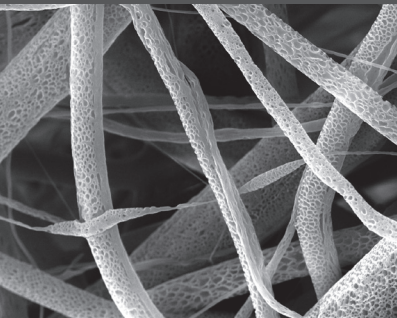
Laboratory of Tissue Engineering

The main objectives and activities

- Development of nano- / microfibrous and non-fibrous composite materials suitable for use in tissue engineering (replacements of cartilage, bone, blood vessels, nerve and skin tissues, glaucoma therapy)
- Testing of cytotoxicity of materials according to standard
- Static and dynamic biological in-vitro testing of surface and three-dimensional structures
- Development and testing of drug delivery systems
- Research and development of new spinning principles and technologies leading to the production of nanofibers and nanofibrous composite materials,
- Development and production of textile composite materials for health care (wound covers, bandages, prevention of complications in colorectal surgery).

Specialization of the laboratory

- Research and development of biodegradable and non-degradable tissue engineering carriers (intelligent wound covers, vascular replacements, bone and cartilage replacements, glaucoma implants, adhesion prevention materials and for strengthening surgical anastomoses),
- focus mainly on nanofiber and composite materials, foams, 3D structures and linear formations,
- For the materials produced, morphological analysis is performed using optical (including fluorescent) and electron microscopy and EDS analysis.
- Materials are tested in-vitro using selected cell cultures (3T3, NHDF, HUVEC, MG63, HEKa) for cytotoxicity, cell adhesion, viability and cell proliferation rate (MTT assay, CCK-8 assay, fluorescence microscopy and scanning electron microscopy).



Specific devices and outcomes

Collaborations

- *Institute of Experimental Medicine*
- *AS CR*
- *2nd Faculty of Medicine*
- *Third Faculty of Medicine*
- *PF UPOL*
- *Liberec Regional Hospital*
- *Biomedical Center of the Faculty of Medicine of Charles University in Pilsen*
- *Clemson University, South Carolina*
- *Michigan Technological University*
- *University of Alabama at Birmingham*
- *ZHAW Zurich University of Applied Sciences*
- *Tübingen University, Germany*
- *IPF, TU Dresden, Germany*

