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FRAUNHOFER INSTITUTE FOR INTERFACIAL ENGINEERING AND BIOTECHNOLOGY IGB

BIOMATERIALS AND BIOLOGIZATION

MATERIAL DEVELOPMENT FOR LIFE SCIENCE PRODUCTS AND MEDICAL DEVICES


EXTRACTION


MODIFICATION


PROCESSING


ANALYTICS

BIOLOGIZATION IN MEDICINE AND MEDICAL TECHNOLOGY

Medical devices go bio. Biopharmaceuticals are already firmly established in the medication of diseases, and now materials in medical technology are being revised and new biomaterials are being developed.

New, tissue-derived materials, bioinspired structures and biofunctional or biologized surfaces will ensure that medical devices, prostheses and implants are better tolerated. Using materials that imitate the biochemical and mechanical properties of natural tissues can minimize irritation in the organism and achieve longer product lifespans. Optimally biomimetics will be available in the future, which can be completely integrated into the body.

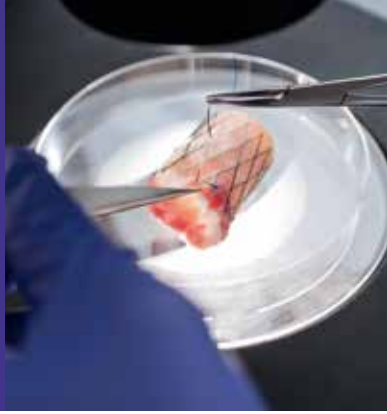
We offer professional support in your development through consulting, contract research and service analysis.

FIELDS OF APPLICATION

We offer R&D services for your innovations, developments, or analyses for e.g.

- Medical devices
- Implants
- Drug-release systems
- *In vitro* diagnostics
- Biosensors
- Tissue engineering
- Sterilization

SPECTRUM OF SERVICES



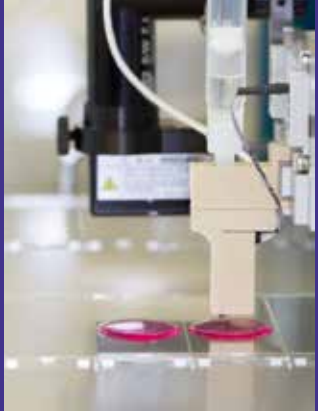
OUR EXPERTISE

Chemical synthesis and extraction of biomaterials

- **Modification of biomolecules**
  Modification with crosslinkable functions, spacers, anchor molecules
- **Isolation from cells and tissues**
  Isolation of collagen, recombinant production of extracellular matrix proteins, tissue specific ECM for click-immobilization
- **Synthesis of polymers**
  Polymers and copolymers with defined functional groups, hydrogels

Processing of biomaterials

- **Particle production**
  Nanoparticles, microparticles, encapsulation of drugs
- **Membrane production**
  Flat membranes, hollow fiber membranes
- **Casting of films and hydrogels**
  Biocompatible crosslinking procedures, thermal, photo-chemically
- **Electrospinning**
  Synthetic polymers and natural proteins
- **Printing**
  2D- and 3D-printing of biomolecules, polymers, polymer composites, cell- and tissue specific ink development for bioprinting

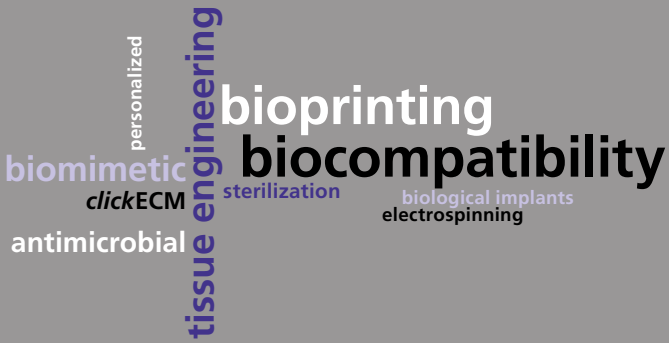


Surface modification

- **Functionalization**
  Activation of surfaces and functionalization with reactive chemical groups by plasma processes
- **Biofunctionalization**
  Immobilization of biomolecules, colonization with cells
- **Coatings**
  Solvent based coatings, vacuum based coatings, functional layers on foils and 3D components, surface structuring
- **Sterilization processes**
  Plasma processes for polymer surfaces to clean, sterilize and remove pyrogens

Analytics

- **Material analysis**
  Polymer analytics, particle analytics, specific physical-chemical properties
- **Surface analysis**
  Topography, chemical composition, wetting, adsorption of molecules
- **Analysis of cell-material-interactions**
  Microbiologic, molecular biologic and cell biologic analyses
- **Cell-based *in vitro* diagnostics**
  Biocompatibility (accredited), skin testing device, *in vitro* detection of pyrogens



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BioRap

Please visit also the website of the Fraunhofer technology platform: ***www.biorap.de***

In cooperation with:

University of Stuttgart
Institute of Interfacial Process Engineering and Plasma Technology

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