Project idea/ Field of expertise: **Bioactive glass scaffolds for tissue repair**

Organisation Name: Paracelsus Medical University, Institute of Anatomy, Nuremberg / TH Simon-Ohm Nuremberg

Adressed challenge(s)/ PPP(s): optimize a novel bioactive glass for biomedical applications

Adressed topic(s) in Work Programme:

- prepare a composite scaffold with a synthetic polymer
- characterize chemistry
- measure and optimize biomechanical properties
- identify additional future applications
- detect additional properties (e.g. antimicrobial?)
- implement further properties

Paracelsus Medical University

Institutional information:

Private university for education of medical students and medical experimental and clinical research, Institute of Anatomy: all areas of **human Anatomy** & **Musculoskeletal research,**

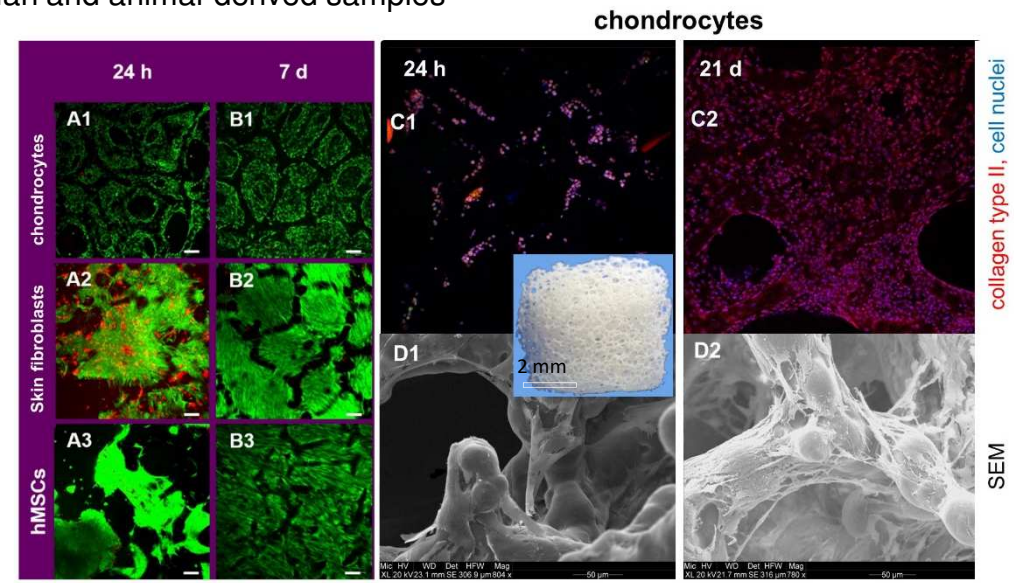
Research group - Bioreconstruction: cartilage, tendon/ligament repair, skin, osteoarthritis

Skills and expertise: (interdisciplinary group: veterinarians, biologist, medical doctor, students)

- **In vitro**: diverse 3D culture systems with primary cells (chondrocytes, ligamentocytes, tenocytes, stem cells, endothelial cells) with/without diverse types of biomaterials, co-cultures, (immuno-)histology, biomaterial testing, hyperglycemia models
- **Methods:** (immuno-)histology, histopathological analyses, confocal laser scanning microscopy, RTD-PCR, Westernblotting, assays (proliferation, cytotoxicity, metabolic activity, tube formation…)
- **Animal models:** nude mice xenograft model: *in vivo* chondrogenesis and tenogenesis, osteoarthritis, arterio-venous fistula, diabetes models in the rat (surgically induced: MMT), further experience: matrix assisted autologous chondrocytes transplantation (minipig and rabbit), partial Achilles tendon defect model (rabbit)
- **Gross anatomy dissection techniques** of human and animal-derived samples

Past experience

in EU-funded projects: none



Green: vital cells, red: dead cells

Our project idea / expertise

- **Description of your project idea (and why you expect it to be successful)**

Completely novel bioactive glass scaffold (patented 2019):

Technische Hochschule Simon Ohm & Paracelsus Medical University in Nuremberg (Germany)

- It does not lead to hydroxyapatite deposition like other bioglasses
- It is cytocompatible and degradable
- It has already been tested as a cell carrier for primary cell types including chondrocytes, mesenchymal stem cells, ligamentocytes or human skin fibroblasts (~TLR3)
- It has also been used as part of a composite scaffold with PLLA
- Currently, testings in *in vivo* models are planed

- **Description of what you can offer to other proposals or request from partners**

Request:

- Ideas for elaboration of additional applications
- Expertise concerning analysis of synthetic polymer chemistry and structure for envisaged composites
- Strategies to prepare composites e.g. electrospinning, bioprinting
- Testing of potential e.g. antimicrobial properties

Offers: Cartilage / tendon tissue engineering, biomaterial testing with primary cells, animal models, histo-/pathology, gross anatomical dissection

Consortium: for **NMBP-21-2020**

Known partners / Competence offer			
Name	**Type**	**Country**	**Role in the project**
Gundula Schulze-Tanzil, PMU, Nuremberg	Uni-versity	Germany	Biomedical *in vitro* testing (primary human-derived cells: cartilage, ligament, skin, stem cells), *in vivo* testing (rodent models), based on previous experience: conceptualization of larger animal models for the project
Sven Wiltzsch **Armin Lenhart** **Jens Helbig** TH-Nuremberg	Uni-versity	Germany	Bioactive glass fabrication, optimization, preparation of suitable composites (bioglass with PLLA) Project coordination/organization
Partner search			
Profile	**Type**	**Country**	**Role in the project**
n.n.		EU	Chemical material characterization: of the bioglass itself and of a reproducible synthetic polymer in composites
n.n.		EU	Identify additional applications: skin, bone repair? Prepare versatile composites
n.n.			Facility for large animal testing?

Contact details

Contact person

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