

# Advanced Microforming Processes and Nanomaterials

Prof. Dr. Christoph Hartl

Successful R&I in Europe 2018

# Key Figures - TH Köln

- University of Technology, Arts and Sciences
- 11 faculties
- 26000 students
- More than 90 courses of study
- More than 1800 employees, including 420 professors and 600 scientific assistants
- 342 partner universities in 94 countries
- Involved in more than 20 EU projects over the past three years, including:
  - 7 current projects (FP7, Horizon 2020)
  - 3 current Marie Curie ITN projects and associated partner in one ITN
  - One granted proposal in the Creative Europe Programme
  - 7 current Erasmus+ KA2 projects



HR EXCELLENCE IN RESEARCH



# Teams and partners - scientific and technological expertise

## The Team at TH Köln

- Microforming for high volume manufacture
- Modelling and simulation
- Laser machining
- Surface technology and functional materials
- Environmental management
- Human-robot collaboration

## EU project participation

- POLYTUBES Polymer micro-tubes and tubular micro components (FP7)
- MASMICRO Mass-manufacture of miniature/micro products (FP6)

## The Team at University of Cagliari

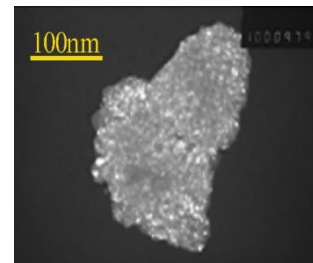
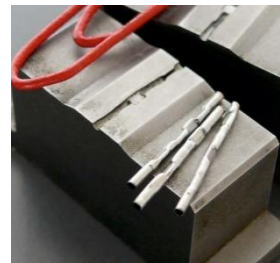
- Design, synthesis, characterization of inorganic, organometallic and hybrid materials, nanostructured micro and mesoporous solids
- Synthesis of intermediates and fine chemicals in organic chemistry
- Fluorescent molecular sensors (detection of toxic ions and inorganic anions)

## European network partners

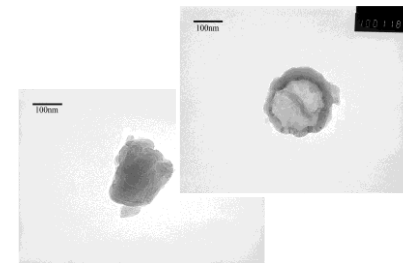
- Medicinal products (ES)
- Nanobiotechnology (ES)
- Nanomaterials (IE, ES)
- Enzymes and proteins (IE)
- Computational design of advanced materials (IE)
- Ionic liquids (IE)
- Additive Manufacturing (PL, UK)
- Life cycle assessment (IT)



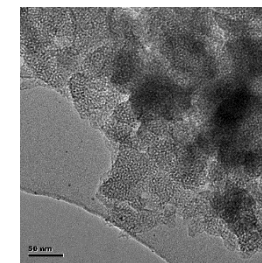
Polymeric and metallic micro-components



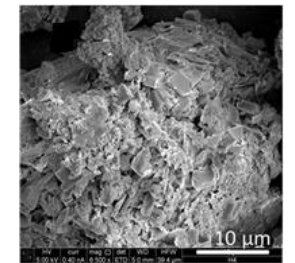
Fe<sub>3</sub>O<sub>4</sub>-SiO<sub>2</sub> Nanocomposites



Caffeine-SiO<sub>2</sub> Nanocomposites



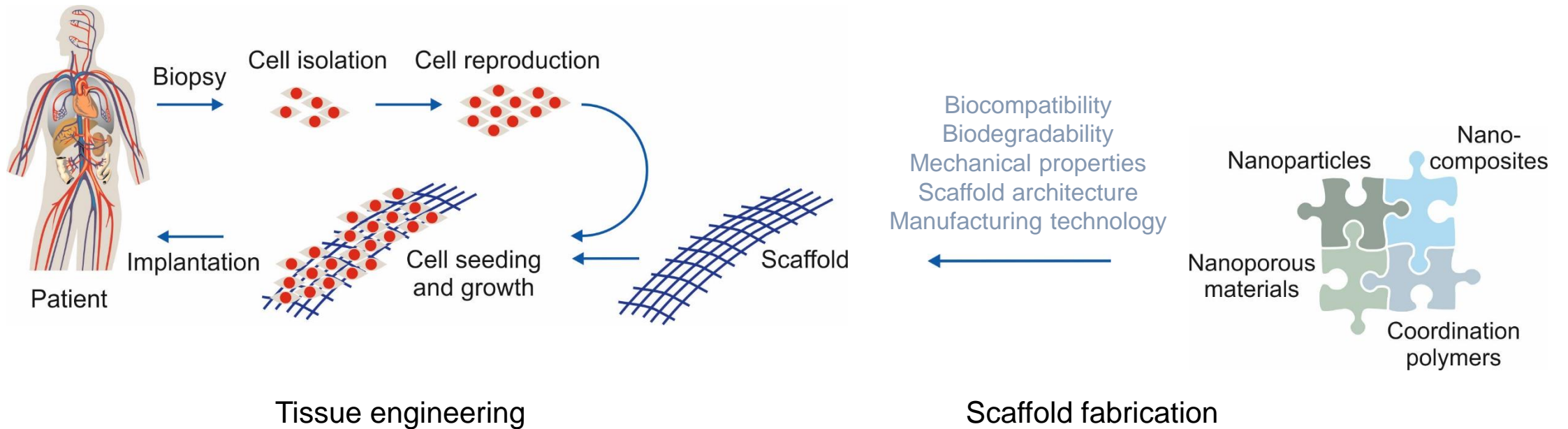
Mesoporous SiO<sub>2</sub>



Coordination polymers

# Regenerative medicine

- Regenerative medicine replaces or regenerates human cells, tissue or organs to restore or establish normal function
- A specific challenge is to use recent scientific discoveries to extend the regenerative approach to major diseases, considering unmet clinical needs for a larger patient group



# What we are looking for

- Research partners and industrial partners working on the field of **regenerative medicine** and interested in novel scaffold techniques to establish a consortium for a Horizon 2020 proposal
- Collaborations with research partners and industrial partners for Horizon 2020 projects and proposals:
  - in the field of **manufacturing technology** where we are offering know-how and support in micro-technology, process development and simulation, prototyping, environmental management (TH Köln)
  - in the field of **nanotechnology** where we are offering design, synthesis and characterization of advanced nanomaterials (Università degli Studi di Cagliari)

**Suggestions are welcome ...**

# Thanks for your interest

## Contact

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