EU PROJECT OFFICER
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Title
Functionally graded Additive Manufacturing scaffolds by hybrid manufacturing

Call
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PROJECT FACTS

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Project coordination

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Development of a new hybrid 3D printing technology for implants manufacturing
In the EU-funded research and innovation project "Functionally graded Additive Manufacturing scaffolds by hybrid manufacturing" acronymed „FAST”, nine European companies and research institutes have teamed up to make a new 3D printing technology available for the routine and cost-efficient manufacture of bone scaffolds highly customized to the patient and the specific clinical condition. A key feature of the FAST technology is the combination of 3D printing and the solventless coating process of the scaffolds in one single machine.

Capabilities of this hybrid printing system include the printing of conventional and also within the project newly developed biodegradable materials with graded properties in

- porosity,
- mechanical stability and
- biochemistry such as cell growth or antibiotic activity

over the volume and the surface of the scaffold.

Promising scaffold materials investigated in FAST include composites made of polymer blends and newly developed fillers controlling mechanical stability and carrying anti-inflammatory and antibiotic drugs.

Thin biochemically active coatings applied solventlessly to the scaffold surface are used to improve the ingrowth behaviour (osseointegration) of the scaffold. Solventless coating is accomplished using a cold physical plasma from a so-called plasma jet where the plasma contains a suitable film-forming agent.

Target fields of application of FAST scaffolds include treatment subsequent to bone trauma, tumor, infection, nonunion after fracture where it is the aim to offer an advanced alternative to existing methods with

- improved osseointegration of the bone scaffolds
- enhanced suppression of post-surgery infections
- optimized implant lifetime
- reduction of the number of revision surgeries

in order to increase patient comfort.

A successful development in FAST will thus serve the patient needs and at the same time offer perspectives for savings in the health provision system.