



# **INDTECH2018**

## **Innovative industries for smart growth**

29-31 October, 2018  
Vienna, Austria

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**PILLAR 2**

**Session 2.2**

**Biomimetic strategy for bone regeneration**

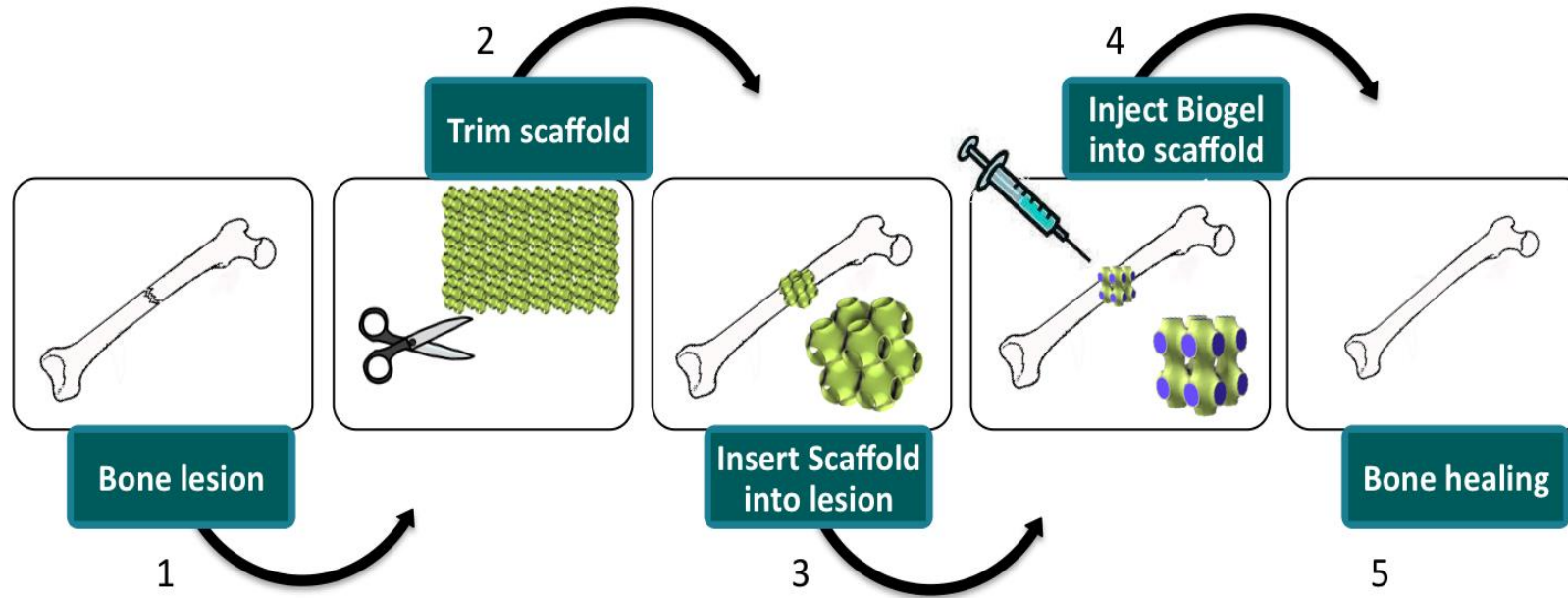
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University of Vienna**

**30 October 2018**



# Dual component InnovaBone product



## Objectives:

To design and produce a novel 2-step smart bio-scaffold and smart self-setting gel

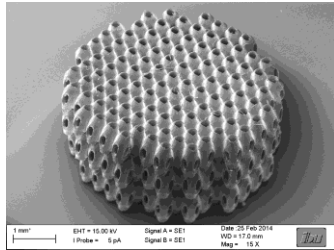
To evaluate the biological and physical properties of bioscaffold-biogel biomaterials

To upscale the technological processes allowing the manufacture of prototype scaffolds

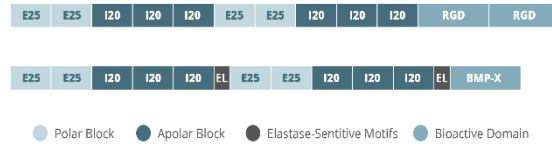
**Biomimetic strategy:** Stimulate the patient bone to build new bone matrix by growth factors and stimulate mineralisation by nanoparticles



# Production and evaluation of biomaterials



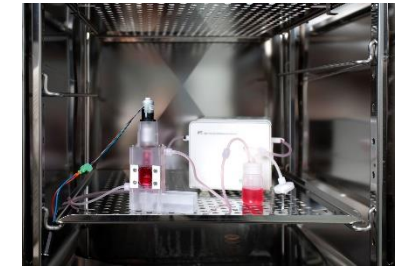
Scaffold (Iba)



elastin-biogel with BMP2, BMP7 (Uva)

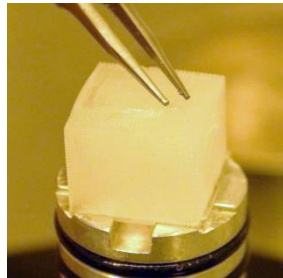


material testing (UNOTT)  
material and *in vitro* testing (Ucam)

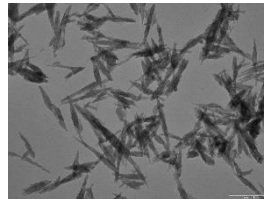


3D *in vitro* testing (CSEM)

## Production

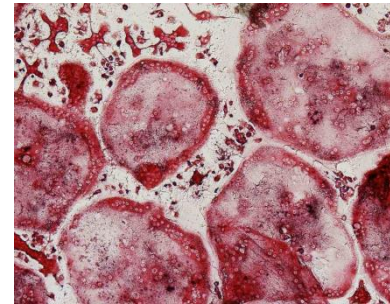


scaffold upscaling (TETRA)

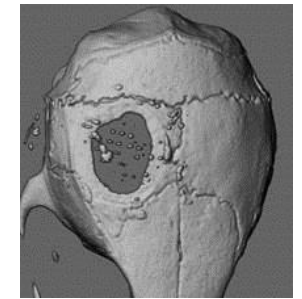


hydroxyl apatite Nanoparticles (UPC)

## Biocompatibility



*in vitro* and *in vivo* testing (Univie, MUW)



*in vivo* testing (UMG-Goe)

## Results of the InnovaBone project

- Established a novel material platform for bone tissue engineering based on 2-photon polymerization (PP) of lactide, caprolactone, methacrylate, LCM
- Created first ever 2-PP equipment to produce 15 x 15 mm LCM scaffolds
- Commercialized upscaled 2-PP equipment
- Manufactured novel compact, low cost bioreactor: biomaterial mechanics
- Established innovative *in vitro* + *in vivo* biomaterial platform for bone repair
- Established models for evaluating foreign body responses

## **Outreach activities**

Orthopedic surgeon-assisted scaffold design

Close connection to stakeholders throughout the project

Clustering actions for the H2020 biomaterial research community

EU-publication: Towards nanotechnology-based osteochondral reconstruction

## **Lack of continuous funding**

Novel compact, low cost bioreactor needs further funding

No EU-funding available to continue the development of biomaterials

Scientific personnel cannot be employed after the project.

## Conclusion

- A variety of biomaterials,
- Equipment
- Testing platforms
- Funding
- Market