

COST Action MP1301 2013|2017

# NEWGEN

## New Generation Biomimetic and Customized Implants for Bone Engineering

### Objectives

- The tailoring of the bioresorbability rate by an adjustment of compositions: **Degradable implants**
- The processing of functionally graded biomaterials (bio-FGM) with a close control of composition, of external shape and of hierarchical interconnected porosity, in order to mimic the natural bone structure: **Functional biomaterials for improved biocompatibility**
- The implant functionalization: promoting bone growth by soliciting the osteogenic activity of osteoblasts by controlled diffusion of growth factors by the materials with added biocidal molecules: **Long-term stability, improved biocompatibility performances**
- The validation by in-vitro and in-vivo testing of the biocomposite materials. **Development of in vitro assays as indicators of long-term in vivo performance, demonstration of improved therapeutic outcomes for surgery, comprehensive pre-clinical data**
- The scaling-up of the complete process to a medical environment through a medical certification at each step of the process: **Implant in optimal position for entering further clinical trials and integration of the whole manufacturing process within the industries and hospital environment.**
- The progression of European industries into European and global biomaterials markets
- The dissemination and the transfer of the resulting collaborative work
- **The promotion of innovative projects in the field of tissue engineering**
- The development of education and training of young multidisciplinary researchers

### Working Groups

- **WG 1:** Design and Synthesis of New Materials / C. Baudin (ES) and A. Leriche (FR)
- **WG 2:** Manufacturing and characterization of 3D-porous scaffolds / J. Chevalier (FR) and H. Mulvihill (IE)
- **WG 3:** Functionalization of implants for improved functional and therapeutic effects / E. Adolfsson (SE) and N. Schneider (DE)
- **WG 4:** In vitro evaluation of the performance / F. Monteiro (PT) and B. Fernández-Gutiérrez (ES)

### Main Achievements

- Open and flexible network is already created : more than 140 institutions joined NEWGEN
- Significantly large network to obtain an exhaustive European roadmap (R&D, market, etc.)
- Working Groups composed with representatives from:
  - Academic groups with their knowledge from the different scientific and technological disciplines,
  - R&D centres and their transfer and scaling-up experiences
  - Medical units bringing their large applied expertise
  - Industrials with innovation and development skills
- 1<sup>st</sup> Workshop in Torino (March 2014), 2<sup>nd</sup> Workshop in Nantes (May 2014), 3<sup>rd</sup> Workshop in La Valette (MT – February 2015)

### Gender Balance and Early Stage Researcher

- Objectives: Involvement of ESR in NEWGEN network to give opportunities to develop interactions with industrial and medical partners
- Status: 6 ESR takes part to the 1<sup>st</sup> STSM call, on the 8 allowed. Counting through the whole consortium in progress. School organized in 2015
- Gender balance: the vice-chair and three leaders/vice-leaders of WG are female, as well as more than 30% of whole consortium members

### Dissemination

- Website with diffusion of partners activities in the field
- Joined publications in process

[www.cost.eu/mpns](http://www.cost.eu/mpns)

Materials,  
Physics &  
Nanosciences  
(MPNS)



Participating countries: 29

AT, BE, BG, CH, CZ, DE, DK, EL, ES, FI, FR, HR, HU, IE, IL, IS, IT, LT, LV, MT, NL, NO, PL, PT, RO, SI, SK, SE, TR, UK

Internat. Collaboration:

USA, CA

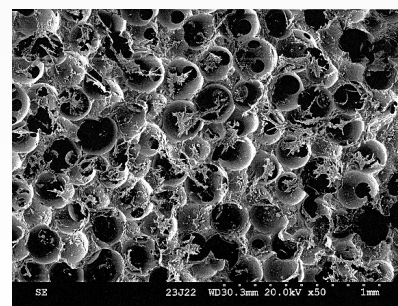
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**Action Website**  
[www.cost-newgen.org](http://www.cost-newgen.org)



Macro-micro porous HA sample colonized by MC3T3-E1 osteoblasts after 6-days culture (courtesy of LMCPA and U1008 – FR – Newgen partners)



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