

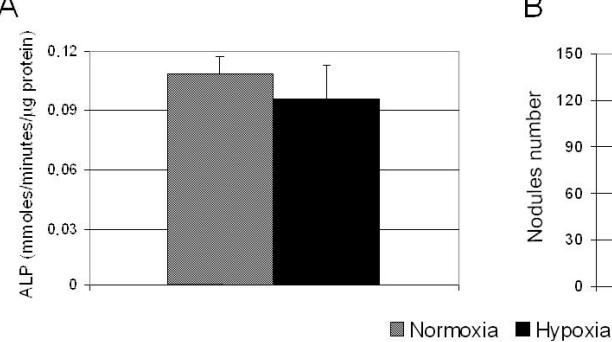
GENERAL PRESENTATION

- **Complete denomination:** SSD Fisiopatologia Ortopedica e Medicina Rigenerativa
- **Location (city, country):** Bologna, Italy
- **Director:** Nicola Baldini
- **Contact person in NEWGEN:** Gabriela Ciapetti [gabriela.ciapetti@ior.it]
- **Working Group involvement:** WG4
- **Staff:** 13 (1 Prof, 6 Res Assistants, 5 Granted Res, 1 PhD)
- **Research topics:** bone pathophysiology - bone engineering - MSC in bone and bone cancer – bone regeneration: cells, mechanisms, scaffolds – MSC paracrine activity (exosomes) – clinical trials using MSC for bone diseases/injuries - natural drugs against bone resorption.
- **Researchers expertises:** MSC from BM and AT, human osteoclast differentiation, *in vitro* response of human cells to 2D/3D materials (calcium phosphate, calcium silicate, polymers, PEM, metals), cancer stem cells, circulating metal ions in TJR patients, metal hypersensitivity, bone histology.

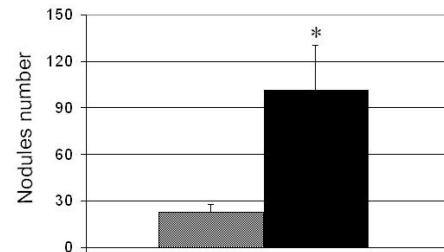
BIOMATERIALS/NEWGEN TOPICS

Isolation/expansion/differentiation of human bone-forming cells

A



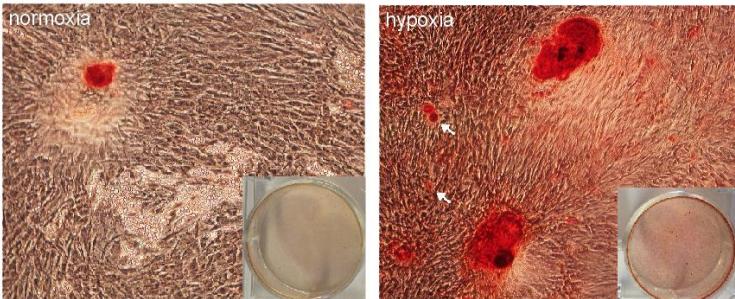
B



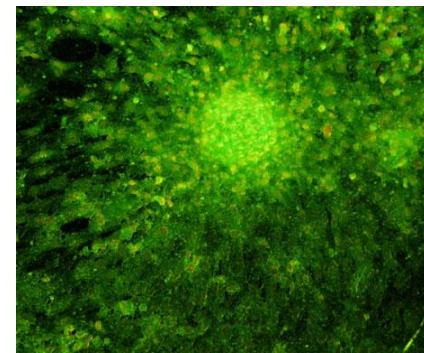
Osteoblasts from bone chips



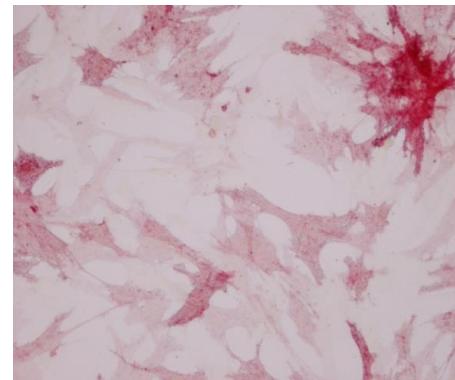
C



Osteogenic differentiation of MSC: hypoxia vs normoxia

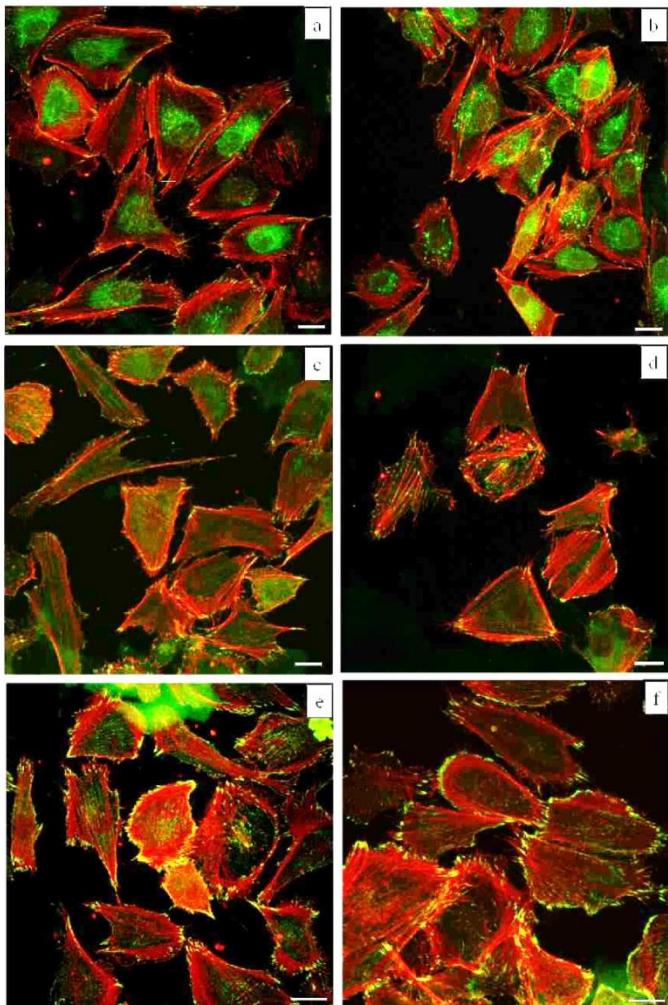


mineral nodule in MSC culture (calcein)



ALP+ MSC from bone marrow

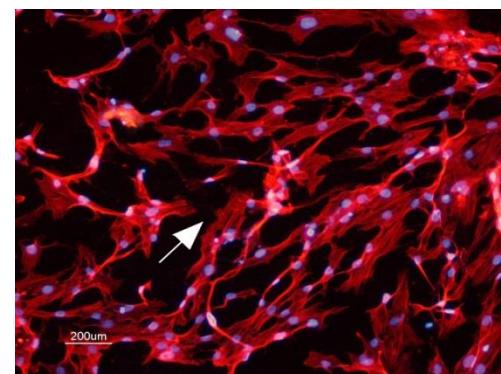
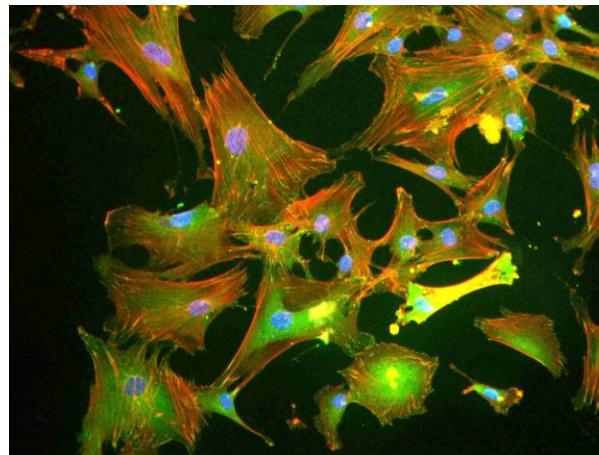
BIOMATERIALS/NEWGEN TOPICS



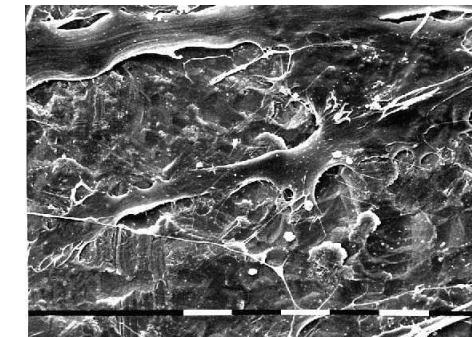
Vinculin & actin in MSC on PEM

Cells on 2D materials

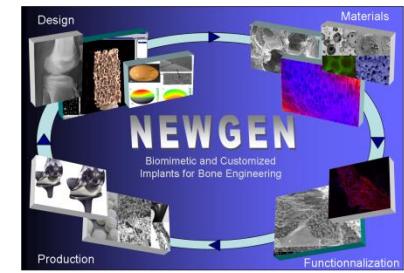
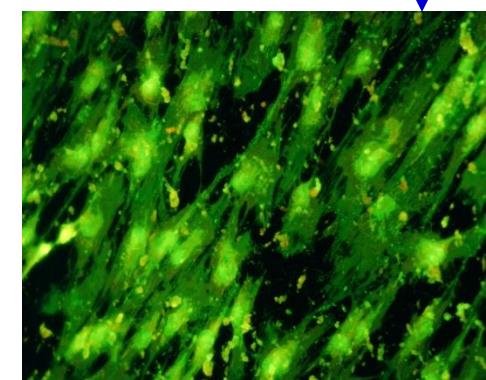
MSC on recombinant elastin



MSC on elastin peptide



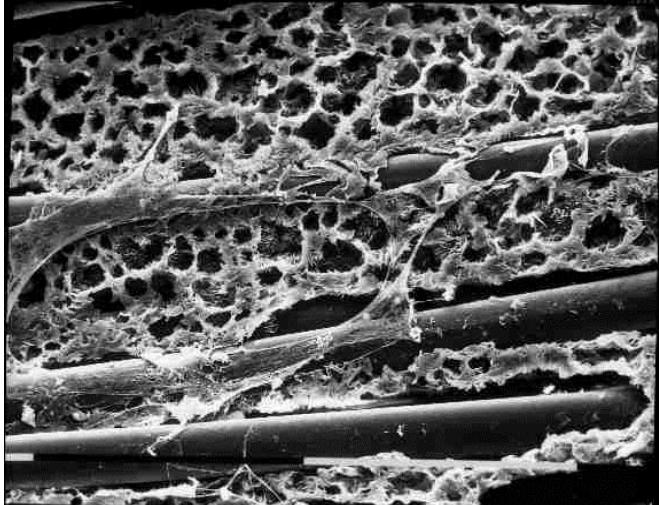
↑ MSC on rough titanium ↓



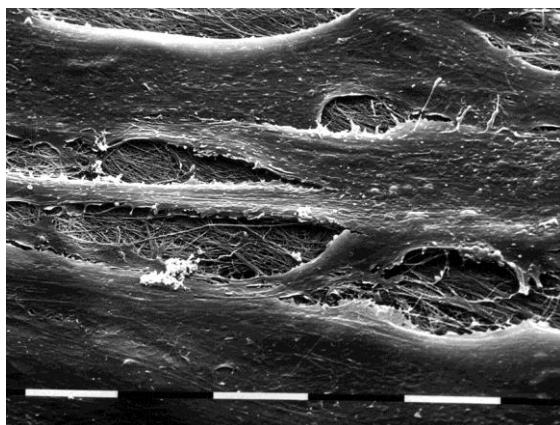
BIOMATERIALS/NEWGEN TOPICS



SERVIZIO SANITARIO REGIONALE
EMILIA - ROMAGNA
Istituto Ortopedico Rizzoli di Bologna
Istituto di Ricovero e Cura a Carattere Scientifico

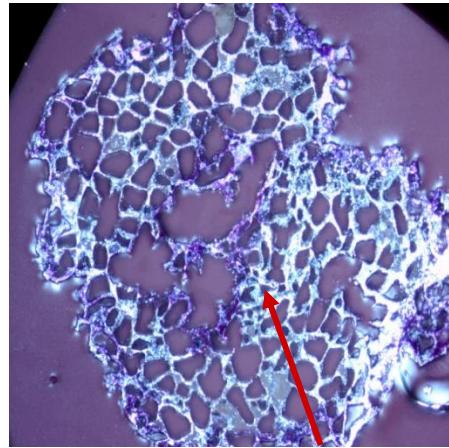


MSC on PCL_PLLA



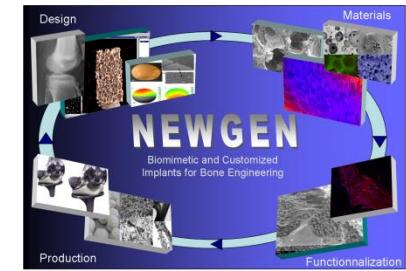
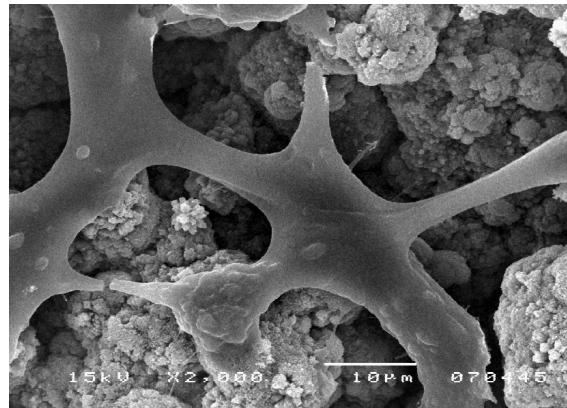
MSC on PCL_TCP

Cells on 3D materials



Osteoblasts inside or at the surface of a PCL scaffold

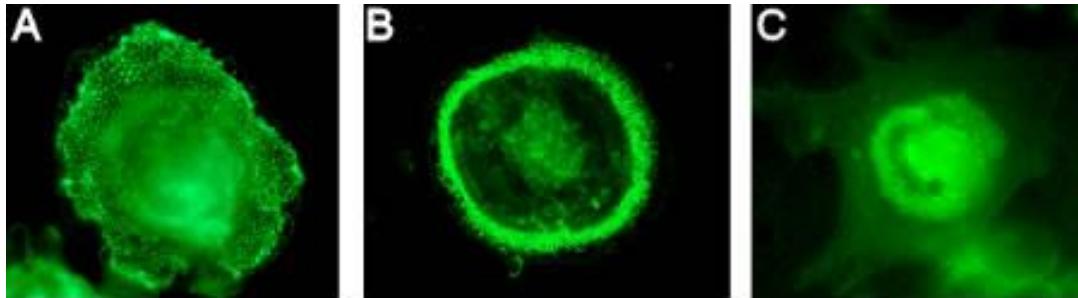
MSC on a calcium-silicate dental cement



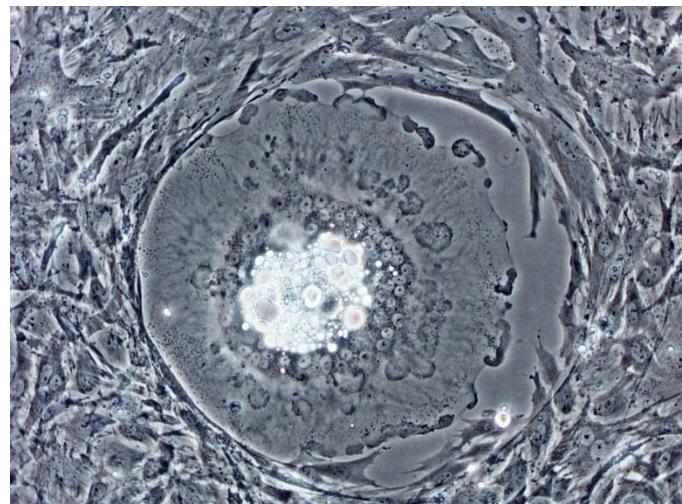
COST Action MP1301

BIOMATERIALS/NEWGEN TOPICS

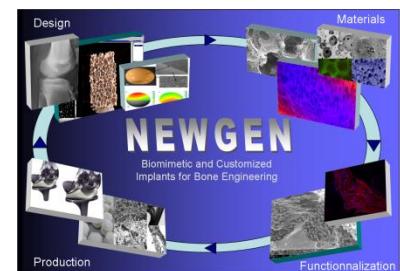
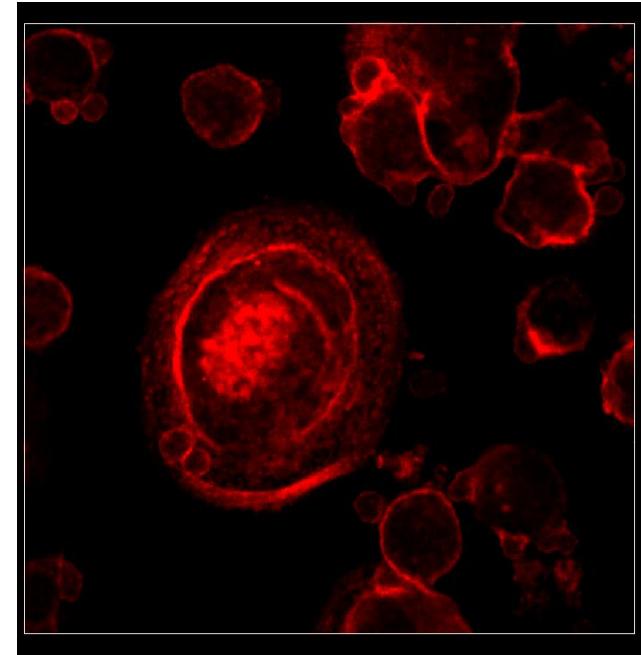
Human bone-resorbing cells



Osteoclast differentiation from human blood circulating monocytes

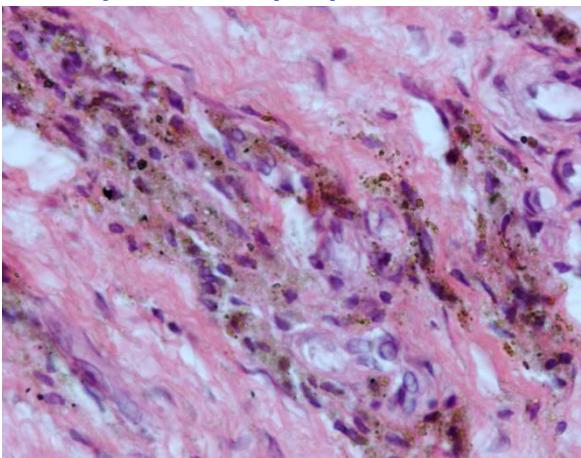


OC on CaP cement



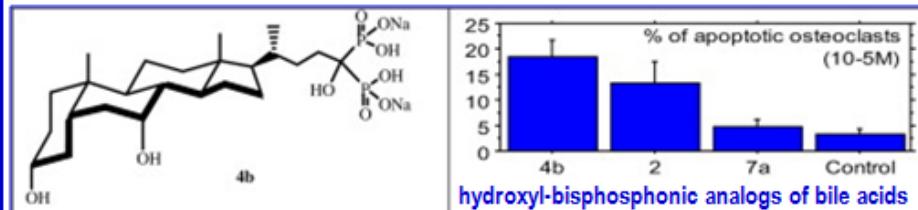
BIOMATERIALS/NEWGEN TOPICS

Al₂O₃ particles in periprosthetic tissue



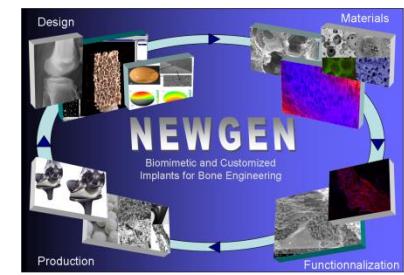
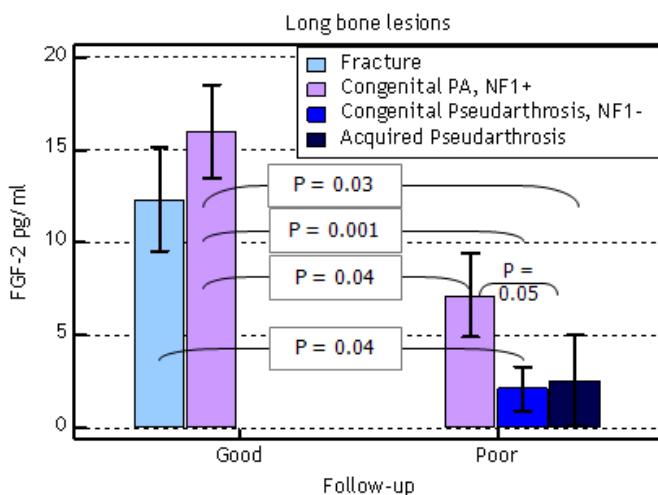
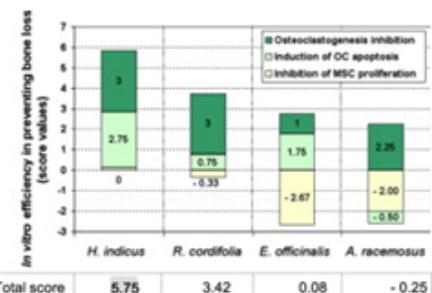
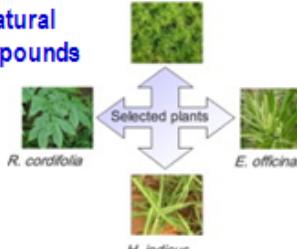
Bone pathophysiology

Pre-clinical evaluation of molecules/drugs for regulating bone remodelling



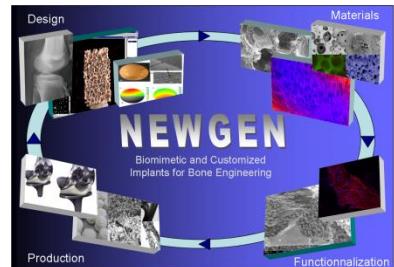
A. racemosus

Natural compounds



FACILITIES

- Cell incubators with CO₂ or oxygen control
- Liquid nitrogen cell freezing
- Flow cytometry
- Confocal Microscopy
- Inverted and Fluorescence Microscopy
- Image Analyzer
- Bone tissue histology
- Graphite Furnace Atomic Absorption Spectrometry
- RT-PCR
- Real-time PCR



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