Joelle Amédée Vilamitjana, Ph.D.
Director of Research (DR1 Inserm)

Head of the Federative Research Structure “Technologies for Healh” - University of Bordeaux
Coordinator of the Bordeaux Consortium for Regenerative Medicine (BxCRM) - University of Bordeaux

Research Interests: Bone tissue engineering

Her research activity is focused from many years on bone tissue engineering and developed both cell-free and cell-based approaches for bone tissue regeneration. Her research programs are achieved by a combination of cell/molecular analysis and technological developments carried out:

è*in vitro,* by improving the knowledge on the interface between human adult stem cells (human endothelial progenitor cells, human mesenchymal stem cells from bone marrow, adipose tissue) with 3D matrices (mainly phosphate calcium-based scaffolds and composite polymer matrices). Her research has been focused from more than ten years on the role played by the cell to cell communication for bone tissue regeneration in two and three-dimensional scaffods. Cellular and molecular players at the interface between osteogenesis and angiogenesis have been identified using coculture models of human mesenchymal stem cells and human endothelial progenitor cells. More recently, her interest has been centered on the impact of nervous system on bone tissue regeneration and vascularization.

è *in vivo,* by understanding the interaction between the scaffolds or the tissue engineered constructs with the host tissue, using different preclinical models of bone defects, in small and large animals (analysis of osteoinduction, osteoconduction and vascularization processes.

Keywords/expertise

- Human cell culture
- Adult stem cells
- Bone biology
- Mesenchymal stem cells
- Endothelial cells
- Tissue-engineering
- Bioengineering
- Regenerative Medicine

- Cell-based therapies
- Cell-free strategy
- Cell communication
- Gap junction
- Connexin
- Pannexin
- Scaffold
- Calcium phosphate
- Composite polymers
- Pre-clinical studies
- Osteoinduction
- osteoconduction
- Translational medicine
- Patents
- Technology transfert

Selected publications from 2009

1. Oliveira H, Catros S, Boiziau C, Siadous R, Marti-Munoz J, Bareille R, Rey S, Castano O, Planell J, **Amédée J**, Engel E. The proangiogenic potential of a novel calcium releasing biomaterial: Impact on cell recruitment. Acta Biomater. 2016;29:435-45.
2. Velard F, Schlaubitz S, Fricain JC, Guillaume C, Laurent-Maquin D, Möller-Siegert J, Vidal L, Jallot E, Sayen S, Raissle O, Nedelec JM, Vix-Guterl C, Anselme K, **Amédée J*,** Laquerrière P*. In vitro and in vivo evaluation of the inflammatory potential of various nanoporous hydroxyapatite biomaterials. Nanomedicine. 2015;10(5):785-802.
3. Fricain JC, Schlaubitz S, Le Visage C, Arnault I, Derkaoui SM, Siadous R, Catros S, Lalande C, Bareille R, Renard M, Fabre T, Cornet S, Durand M, Léonard A, Sahraoui N, Letourneur D, **Amédée J.** A nano-hydroxyapatite - Pullulan/dextran polysaccharide composite macroporous material for bone tissue engineering. Biomaterials. 2013;34:2947-2959.
4. Velard F, Braux J, **Amedee J**, Laquerriere P*. Inflammatory cell response to calcium phosphate biomaterial particles: an overview. Acta Biomater. 2013;9(2):4956-63.
5. Guerrero J, Catros S, Derkaoui SM, Lalande C, Siadous R, Bareille R, Thébaud N, Bordenave L Chassande O, Le Visage C, Letourneur D, **Amédée J**. Cell interactions between human progenitor-derived endothelial cells and human mesenchymal stem cells in a three-dimensional macroporous polysaccharide-based scaffold promote osteogenesis. Acta Biomater 2013;9(9):8200-13.
6. Bidarra SJ, Barrias CC, Barbosa MA, Soares R, **Amédée J**, Granja PL. Phenotypic and proliferative modulation of human mesenchymal stem cells via crosstalk with endothelial cells. Stem Cell Res. 2011 Nov;7(3):186-97.
7. Lalande C, Miraux S, Derkaoui SM, Mornet S, Bareille R, Fricain JC, Franconi JM, Le Visage C, Letourneur D, **Amédée J**, Bouzier-Sore AK. Magnetic resonance imaging tracking of human adipose derived stromal cells within three-dimensional scaffolds for bone tissue engineering. Eur Cell Mater. 2011 Apr 11;21:341-54.
8. Li H, Daculsi R, Grellier M, Bareille R, Bourget C, Remy M, **Amedee J**. The role of vascular actors in two dimensional dialogue of human bone marrow stromal cell and endothelial cell for inducing self-assembled network. PLoS One. 2011 Feb 3;6(2):e16767.
9. Li H, Daculsi R, Grellier M, Bareille R, Bourget C, **Amedée J.** Role of neural-cadherin in early osteoblastic differentiation of human bone marrow stromal cells cocultured with human umbilical vein endothelial cells. Am J Physiol Cell Physiol. 2010 Aug;299(2):C422-30.
10. Grellier M, Bordenave L, **Amédée J.** Cell-to-cell communication between osteogenic and endothelial lineages: implications for tissue engineering. Trends Biotechnol. 2009 Oct;27(10):562-71.

Patents

1. Guinez Ch., Laversanne R, Amédée J. - A pharmaceutical composition containing a defined lipid system .US 20030072797 .
2. Mahy P, Roux D, Laversanne R, Amédée J, Freund O. Compositions containing at least one nucleic acid. US 20020012696
3. Amédée J, Letourneur D, Le Visage C, Derkaoui SM, Fricain JC, Catros S. Porous polysaccharide scaffold comprising nano-hydroxyapatite and use for bone formation. Inserm patent PCT/EP2012/064924
   licencing by SilTiss (Member of the Administration Committee of the Company)

Teaching and Training Activities

Teaching at different masters in cell biology and physiopathology, Biomaterials and Medical devices at the University of Bordeaux; Paris Descartes; Paris VII; Claude Bernard, Lyon,
Training of 12 PhD students, 7 post-doc, 16 master students from 1993.

Fundings

National funds from: GBM Aquitaine, Conseil Régional d'Aquitaine, Agence de Biomédecine, RNTS, Fondation de l'Avenir, Fondation pour la Recherche Médicale, ANR PNANO, ANR Blanc, ANR Emergence, ANR TECSAN.

Partner to several Concerted Actions or European Programmes: (BIOMED 2, 1985 – "Skeletal Implant", 1993 – "BITES" (1999-2002.). Euronanomed FP7 NANGIOFRAC (2012-2015)-. FP7 NAMBIO COST (2012-2014). Programme de Recherche Avancée (PRA) with China, Greece. Funds from Inserm/DHOS (2010-2011)

Main collaborations with companies: TEKNIMED, CREASPINE, CAPSULIS/ETHYPHARM (scientific consultance for 3 years from 1999 to 2002, CIFRE PhD), MERCK BIOMATERIALS (Darmstadt, Germany, CIFRE, PhD), ABCELLBIO, Medical Biomat - Medical Lab, Straumann, SilTiss.

Awards:

Fellow - Biomaterials Science and Engineering FBSE, World Biomaterials Congress, Chengdu, Chine (2012).

Education

PhD in Cell and Molecular Biology - University of Bordeaux 2, 1985
Authorization for PhD training (Habilitation à Diriger des Recherches), University of Bordeaux 2, 1993

Links

- ESB: European Society for Biomaterials: *http//*www.esbiomaterials.eu. Member of the European Society for Biomaterials (ESB) Council Committee from 2011 and Vice-President of ESB from 2015. www.esbiomaterials.eu
- BxCRM: Bordeaux Consortium for Regenerative Medicine: https://bcrm.u-bordeaux.fr
- BIOMAT : The French association for the development of biomaterials, Tissue Engineering and Regenerative Medicine: http://www.biomat.fr