

10th Annual Conference on

Stem Cell & Regenerative Medicine

October 08-09, 2018 | Zurich, Switzerland

Combining jelly fish collagen type II, human stem cells and TGF- β 3 as a therapeutic implant for cartilage repair

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Background: The limitations associated to current therapies for articular cartilage repair led us to develop new strategies of applicable therapeutic materials. Human mesenchymal stem cells from bone marrow promise relevant cell sources for cell therapy and regenerative medicine in particular for cartilage repair. Recently, a new source of non-mammalian collagen type II emerged and represents a promising tool for cartilage tissue engineering.

Methods: To develop a new therapeutic implant for cartilage repair, we combined jelly fish collagen type II as an implant, active nano reservoirs of TGF- β 3 growth factors and adult human mesenchymal stem cells derived from bone marrow.

Results: Our results indicated clearly that the jelly fish collagen type II implant leads to the chondrogenic differentiation of mesenchymal stem cells; the combined implant and active therapeutic TGF- β 3 as nano reservoirs led to chondrogenic gene expression and cartilage differentiation.

Conclusion: We reported here a new stem cell based therapeutic active implant for cartilage repair. This approach combines jelly fish collagen type II, human stem cells and TGF- β 3 as a therapeutic implant to improve cartilage differentiation and repair.

Biography

Marion Pugliano is a second year PhD student in the Inserm UMR1260/University of Strasbourg, Regenerative Nano Medicine Laboratory, Strasbourg, France. He is working on the development and the optimization of an implantable medical device for the regeneration of the entire osteochondral unit. He also completed his Graduation with a Physiopathology Master's of Science, a Cellular Biology and Physiology Licence/Bachelor's of Science and a two year Technical Degree in Biotechnology.

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