Poster Abstract Book

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of stem cell function. We have designed a highly innovative approach, to overcome this critical barrier, and developed novel methods to increase the differentiation capacity of aged MSCs cultured on 3D printed scaffolds. Our data show that induction of the ZSCAN4 mechanism enhances bone differentiation of aged MSCs and rescues telomere length. Our research goal is to generate novel protocols for rapid generation of patient-specific bone grafts from MSCs attained from minimally invasive procedures. Our research has impact for the treatment of numerous bone degenerative diseases and bone reconstructive procedures.

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T-3065

INJECTABLE SCAFFOLDS FOR TISSUE ENGINEERING

Nakielski, Pawel - *Department of Biosystems and Soft Matter, Institute of Fundamental Technological Research PAS, Warsaw, Poland*
Pawlowska, Sylwia - *Department of Biosystems and Soft Matter, Institute of Fundamental Technological Research PAS, Warsaw, Poland*
Urbanek, Olga - *Laboratory of Polymers and Biomaterials, Institute of Fundamental Technological Research PAS, Warsaw, Poland*
Wozniak-Jezierska, Katarzyna - *Laboratory of Regenerative Medicine, University of Warmia and Mazury, Olsztyn, Poland*
Barczewska, Monika - *Department of Neurology and Neurosurgery, University of Warmia and Mazury, Olsztyn, Poland*
Maksymowicz, Wojciech - *Department of Neurology and Neurosurgery, University of Warmia and Mazury, Olsztyn, Poland*

Intervertebral disc diseases are a significant medical problem affecting many people around the world. In Poland, the statistics of the Social Insurance Institution (Medical Abuse in 2016) indicate that low back pains and other intervertebral disc diseases constitute 17% of the total number of days of sick leave. In connection with the above, current work describes design of a composite scaffold as a carrier in cell therapy, which will contribute to the regeneration of the intervertebral disc, including the increase of its height. Our composite scaffold include nanofibers that were prepared with the use of the electrospinning method. This method is a simple but powerful technique for fabricating desirable nano- and microfibers by using a high potential electric field. Human mesenchymal stem cells (MSCs) were cultured on the scaffold from poly(L-lactide). Proliferation kits and fluorescence microscopy were used to asses cells' viability and adherence to the nanofibers' surface. hMSCs were efficiently cultured on the nanofibrous scaffold and could be readily detected in porous structure of the scaffold after 7 and 14 days of culture. Viability and proliferation kits proved that the material is not toxic. Drug release from nanofibrous material of model growth factor was conducted with pharmacopeia protocols. Drug release of the 14 kDa growth factor was achieved for 14 days without burst release. Nanofibrous biomaterials prove their advances in many tissue engineering applications. Adjustable porosity of the scaffold and the biocompatibility of the biomaterial make it perfect candidate for cells' scaffold in many medical procedures and also as a drug release carrier. With the use of our single nanofibers, such biomaterials can also be readily used in minimally invasive procedures to regenerate IVD.

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COMPARISON OF HUMAN MESENCHYMAL CELLS ADHERENCE AND VIABILITY ON ELECTROSPUN PLGA FIBROUS SCAFFOLDS AND THE COMMERCIALLY AVAILABLE COLLAGEN MATRIX NEVELIA

Pranke, Patricia - *Hematology and Stem Cells Laboratory, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil*
Alcantara, Bruno - *Hematology and Stem-Cells Laboratory, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil*
Gulielmin Dido, Gabriele - *Hematology and Stem-Cells Laboratory, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil*
Lang Camboim, Brendha - *Hematology and Stem-Cells Laboratory, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil*
Sperling, Laura - *Hematology and Stem-Cells Laboratory, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil*

The number of people in Brazil needing skin transplants has been constantly increasing over the last 10 years. There are some commercially available skin substitutes nowadays, most of them being acellular. Mesenchymal stem cells (MSCs) are frequently used in the field of regenerative medicine due to their plasticity, which is their capacity of giving rise to several types of cells. MSCs, when associated with a dermal substitute, could consistently contribute to tissue regeneration. In this study, comparison was done regarding adherence and morphology between the MSCs on the fibrilar scaffolds of 18% PLGA (poly lactic-co-glycolic acid) and the collagen matrix, Nevelia. Fibrous scaffolds were produced by the electrospinning method. The morphology of the fibers was evaluated by scanning electron microscopy and revealed two populations of fibers with diameters of 0.3±0.5µm (thinner) and 1.3±0.06 µm (thicker) with an average fiber diameter of 0.82±0.47 µm. The MSCs were isolated and prepared from human deciduous teeth pulp and characterized by flow cytometry and differentiation assays. The MSCs were cultivated either on the surface of the PLGA scaffolds or the Nevelia membrane, and their viability was analyzed by the WST8 assay at day 1 and 7 after seeding. The