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Fibrin sealant derived from snake venom as scaffold for mesenchymal stem cells (MSCs) in bone defects produced in the femur of rats with osteoporosis

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New Fibrin Sealant (FS) derived from thrombin-like enzyme purified of snake venom and animal fibrinogen (Center for the Study of Venoms and Venomous Animals– CEVAP, UNESP, Brazil) was used as scaffold for bone marrow Mesenchymal Stem Cells (MSCs) in osteoporosis treatment in rat. Wistar rat MSCs of third passage were identified to CD90, ICAM1 (positive) and to CD45, MHC-II CD34 and CD11b (negative). Two-months-old rats were ovariectomized to osteoporosis induction. After 3 months a bonecritical defect (lesion of 5mm) was done in distal ends femur of 56 rats and were filled with FS and FS+MSCs to evaluate effects. Control group (injury and no treatment) and group white (no injury and no treatment) also were added. Femur Analyses were performed 14 and 28 days after surgery. Bone regeneration was evaluated by Alkaline Phosphatase (AP) and Calcium (Ca) levels histological analysis, Scanning Electron Microscopy (SEM), X-ray and Tomography. Differences between means were tested by analysis of variance (ANOVA) followed by significance tests. AP level difference was showed at 28th day. The serum Ca level remained constant. SEM and X-ray revealed a wound healing in 28 days in both treated groups. Histological data showed that the wound healing process in treated animals with FS and FS+MSCs was better than control group, during the experimental period. No significant differences were found between castrated and un-castrated groups comparing the density values in Hounsfield scale (HU). The new fibrin sealant showed to be a potential candidate as scaffolds to MSCs in bone regeneration.

Biography

Patricia Rodrigues Orsi has Degree in Biological Sciences, having Master degree and PhD in Biological Sciences (concentration area Pharmacology) by São Paulo State University "Juliode Mesquita Filho" (UNESP), Brazil. Currently, she is Postdoctoral student at Center for the Study of Venoms and Venomous Animals at UNESP, in developing project with bone tissue regeneration, stem cells and scaffolds.

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