Mesenchymal progenitor cells from collared peccary subcutaneous adipose tissue

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Abstract

The understanding of cell biology and the isolation of mesenchymal stem cells in wild animals show prospects for conducting pre-clinical trials in these unconventional animals. To evaluate the collared peccary (*Tayassu tajacu*) as a potential animal model for the isolation of mesenchymal progenitor cells, cell culture and cell differentiation protocols. To perform this research we used four collared peccaries (*Tayassu tajacu*) from the Nucleus of Study and Preservation of Wild Animals (IBAMA/PI nº 02/08-618) from Federal University of Piauí (UFPI). Adipose tissue fragments were collected from the dorsocervical region and dissociated mechanically in laboratory. The material was placed in an incubator containing CO_2 – 95% at 37°C and the cultures were expanded to fifth passage, evalluating cell concentration and viability. The culture medium alfa-MEM (LGC® Biotechnology, Cat 170.83A) supplemented was changed every three days. The cell kinetics was evaluated in triplicate using growth curve performed during ten days, plating the initial concentration of $5x10^4$ cells/ml per well in P3 six-well culture plate. For cell differentiation in osteoblasts, adipocytes and chondrocytes were plated $5x10^4$ cells/mL in P3 cells culture in six wells with the respective medium for inducing differentiation (StemPro Differentiation Kit®) plates. The first cells with fusiform adherent morphology were visualized after 5 days of cultivation. On the eleventh day the first colony forming units (CFU) and adherent fibroblastoid morphology were observed. The isolated cells cultured to P5 have always presented characteristic fibroblastoid morphology with basophilic cytoplasm and spherical nuclei proliferation in monolayer with a mean viability of 93.8%. The growth curve showed the lag, log and plateau phases, reaching a maximum value of $14x10^4$ cells/mL. The osteogenic differentiation showed cytoplasmic calcium deposit and osteoblasts intensely marked by Alizarin Red. After 21 days, the adipogenic differentiation presented cytoplasmic lipid droplets with variable size, stained with Oil Red O. The chondrogenic differentiation performed in monolayer demonstrated the formation of aggregates (nodule-like), confirming its potential for chondrogenic plasticity. Mesenchymal stem cells from adipose tissue of collared peccaries are a valuable tool for future scientific investigations. We suggest the use of this wild species as an alternative model for preclinical studies in cell therapy.

Ethics Committee: UFPI/CEEA nº 018/13; SISBIO nº 33058-1.