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Characterization of neoplasic patient mesenchymal stem pluripotent cells for autologous cell therapy

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Adipose tissue is a rich source of mesenchymal stem cells with potential benefits in regenerative medicine and tissue engineering. Although many clinical trials are based on autologous stem cell transplantation standard optimized cell expansion conditions still need to be established. Also, even though patients needing cell-based therapies may suffer from a variety of diseases, information on the characteristics of adult stem cells isolated from patients is scarce. In this study mesenchymal stem cells obtained from abdominal fat of cancer patients were compared to those obtained from population-matched healthy donors. Since the expansion in presence of fetal bovine serum or other animal derivatives could not only raise safety concerns but also show batch-to-batch quality variations, all cultures were maintained in xeno-free defined medium. The results obtained clearly show that yields, growth rates and expression of surface markers are not related to the disease state of the donor but to the population doublings of the cultured stem cells. Likewise, plasticity, as measured by their differentiation potential into mature adipocytes, chondroblasts and osteoblasts was dependent on passage number rather than on the disease condition of the donor. Moreover, karyotype analysis of the cultured cells indicates that the source of mesenchymal cells does not compromise their safety and therefore autologous cell-based therapy of cancer patients should be possible. Additionally, mitochondrial cellular pattern changes were associated to passage number and therefore may constitute a marker for the suitability of the expanded cells for therapeutic use.

Biography

Marta García-Contreras (June 13th, 1987; Valencia, Spain) Obtained a B.Sc in Biotechnology at the Polytechnic University of Valencia (UPV) in 2010 working at the Royal Institute of Technology in Stockholm and the Bergen University in Norway as part of her undergrad training. She finished her M.Sc on Medical Biotechnology in 2012 while working, as part of the research staff, at the Institute of molecular recognition and technological development of the UPV. She was hired by the AITEX-textil institute to perform toxicology tests before joining the Ph.D. program at the Catholic University of Valencia where she is currently working in regenerative medicine under the supervision of Drs. JM. García-Verdugo and Elisa Oltra.

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