Improvement of Techniques to "in vitro" Cultivate and Differentiate Stem Cells from Breast Milk

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Among the universe of stem cells, adult mesenchymal cells have demonstrated a great potential to many disease treatment. Although these cells are disseminated in the human body, and neither an ethical and/or religious issue, they are usuallyly inaccessible and often require invasive procedures. Breast milk is a newfound source of mesenchymal stem cells, that has demonstrated to have undifferentiated cells with the potential to be transformed into many cell types. However, their differentiation potential is not fully known yet due to its maintenance difficulties. In order to solve this problem, our research goal is to propose a methodology to improve the “in vitro” maintenance of breast milk stem cells. Cells were collected from volunteer donors and classified into three groups according to the lactation period. We tested some variations in culture media in search of the best collection of factors to maintenance and propagation of cells in an undifferentiated state. Factors such as standard mediums, milk serum, EGF and fetal serum were tested. We also analyzed different matrix adhesion in search of the best protocol to obtain more cells. We found that laminin coated plaques helps to enrich the culture with stem like cells. Mesenchymal stem cells were identified by using specific immunofluorescence and flow cytometry markers in order to confirm the undifferentiated state. The best culture method proposed will provide the subsequent differentiation cells for future tests. This study aims to contribute to the advancement of stem cell research, in favor of a more effective and cheaper future treatment to diseases.