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Mapping of the human amniotic membrane: A morphofunctional study to better understand amniotic membrane stem cells regenerative capacity

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The amniotic membrane (AM) is the innermost part of the placenta, in direct contact with the amniotic fluid. In recent years, the interest toward placenta stem cells has been increasingly growing. At present, two main stem cells populations have been identified in AM: Amniotic epithelial cells (AECs) and amniotic mesenchymal stromal cells (AMSCs). Although AM is an excellent source of cells for regenerative medicine, also due to its immune-modulatory properties and low immunogenicity. Thus, the aim of our study was to map the human AM under physiological conditions to identify possible differences in structural features and regenerative capacity of its components. Human term placentas were collected from healthy women after vaginal delivery or caesarean section at Fondazione Poliambulanza-Istituto Ospedaliero of Brescia or at the SS. Annunziata Hospital of Chieti. Samples of AM were isolated from four different regions according to their position relative to umbilical cord (central, intermediate, peripheral and reflected). By means of immunohistochemistry, morphometry, flow cytometry, electron microscopy, CFU assays and AECs *in vitro* differentiation we demonstrated the existence of different morphofunctional features in the different regions of AM, highlighting that AECs are a heterogeneous stem cell population. This should be taken into account to increase efficiency of amniotic membrane application within a therapeutic context.

Biography

Roberta Di Pietro has obtained her degree in Medicine cum Laude in 1985 and the Specialization in Sports Medicine cum Laude in 1988 from University of Chieti, Italy. She has worked as a Visiting Scientist at the Biochemistry Department, AFRC, UK, at the Pathology Department, USUHS, USA and at the Institute of Human Virology, University of Maryland, USA. In 2005, she became Full Professor of Histology and Embryology at the University of Chieti. She has joined the Editorial Board of *Current Pharmaceutical Design* as an Executive Guest Editor and recently, the Editorial Academy of the *International Journal of Oncology* as an Honorary Member. She is an author of 176 scientific publications plus international e-book chapters, editorials, Italian textbooks and 1 Italian patent.

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