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IPs from autologous human gingival stem cells and extracellular vesicles: a new tool for cardiac regeneration.

The growing number of chronic diseases afflicting the global population underscores the urgency of identifying alternative efficient technologies.Technological innovation and advances in regenerative clinical applications are promising tools in transformative therapeutic impact. The core of regenerative medicine is stem cells. The regenerative field has focused on the study and use of multipotent adult stem cells (MSCs). Furthermore, in recent years, to have a greater potential of the cells for therapeutic purposes, and at the same time to bypass the controversies related to the ethical problems of ESCs use, a lot of studies are focusing on the induced pluripotent stem cell lines (iPSCs) generation. One of the objectives of this work is the characterization of a new pluripotency cell line obtained for the first time by reprogramming human gingival mesenchymal stem cells (hGMSCs- derived iPS cell line) through a non-integrating method. The characterization of the hGMSCs-derived iPS is performed through the evaluation of pluripotent markers expression by realtime PCR, confocal microscopy, and flow cytofluorimetry. Morphological analysis of the hGMSCs-derived iPS colonies was done by scanning electron microscopy in addition to light microscopy. The ability of the hGMSCs-derived iPS to differentiate into the three embryonic layers is demonstrated through the in vitro generation of embryoid bodies, which are evaluated by realtime PCR and confocal microscopy. Therefore, it is characterized the exosome content of both starting hGMSCs and hGMSCs-derived iPS in order to identify more potent therapeutic approaches for regenerative medicine. The second objective of this work is to obtain a new autologous primary cardiomyocytes line from hGMSCs-derived iPS cells through the only use of specific medium. This allows to give an innovative approach for personalized cardiac tissue regeneration.

Keywords: new iPS line, autologous iPS, extracellular vesicles, regenerative medicine, personalized cardiac regeneration

Biography

Ylenia Della Rocca, born in 1995 in Avezzano (Italy), is an Italian researcher expert in medical biotechnology, stem cells and regenerative medicine. Graduated with honors and PhD, she has carried out research in national and international centers, patenting an innovative cell line. Author of 25 scientific articles with over 300 citations, she is active in projects such as PNRR and PRIN. At just 29 years old, she was qualified as an associate professor. She is a speaker at conferences and editor for scientific journals. She has received prestigious awards for excellence in research, including the Best Researcher Award 2024 and the National Award "Ippocrate eSport".

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