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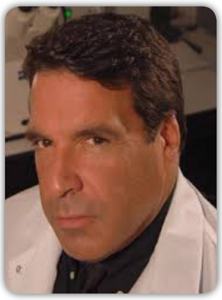

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Decellularized human placenta for tissue and organ regeneration

Recellularization of organ derived decellularized native and functional vasculatures with stem cells or tissue specific cells have been regarded as a viable approach to engineer organ to overcome donor shortage in organ transplantations. Human placenta is a large viable organ with abundant vasculatures and variety of hematopoietic stem cells and non-hematopoietic stem cells. To take advantage of this easily obtainable resource, we explore the feasibility of using human placenta's vasculature as a suitable source for tissue and organoid engineering. We developed a proprietary method of sequential detergent based perfusion process to decellularize an entire human placenta as well as single placenta cotyledons. We demonstrated that the decellularized placenta or single cotyledon maintain efficient circulation and are able to conduct fluid and distribute cells, indicating that the vasculature system remained intact and functional after decellularization. The decellularized human placental vasculature scaffold (DHPVS) were shown to support *in vitro* proliferation and function of cells derived from multiple tissues including human placental adherent cells (PDAC®), primary hepatocytes, thyroid tissue epithelial cells, insulin producing cells and endothelial cells for three weeks. PDAC® grown on DHPVS demonstrated enhanced adipogenic differentiation comparing with 2-D culture when exposed to adipogenic induction culture medium. Furthermore, PDAC® transduced with Luciferase grown on DHPVS were shown to maintain viability for four weeks after subcutaneously implanted in mice. These *in vitro* and in vivo data provide evidences that decellularized human placenta vasculature can support cell growth and differentiation and can be used as a scaffold platform for tissue and organ engineering.

Biography

Robert J Hariri is the Founder and CEO of Celularity, Inc. He is a Surgeon, Biomedical Scientist and highly successful serial Entrepreneur in two technology sectors: Biomedicine and Aerospace. He is the former Chairman, Founder, and Chief Executive Officer of Celgene Cellular Therapeutics, one of the world's largest human cellular therapeutics companies. He has pioneered the use of stem cells to treat a range of life threatening diseases and has made transformative contributions in the field of Tissue Engineering. He is the Co-founded of Human Longevity, Inc., the world's largest gene sequencing operation with genomics legend, J Craig Venter and Xprize founder Peter Diamandis and serves as Vice Chairman. He has over 150 issued and pending patents, has authored over 100 published chapters, articles and abstracts and is most recognized for his discovery of pluripotent stem cells from the placenta and as a member of the team which discovered TNF (tumor necrosis factor). He was the recipient of the Thomas Alva Edison Award in 2007 and 2011, The Fred J Epstein Lifetime Achievement Award and has received numerous other honors for his many contributions to biomedicine and aviation.

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