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## Nanoencapsulation of stem cells and regenerative medicine

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Cell nanoencapsulation is a novel delivery system based on a self-assembly technique mediated by electrostatic interactions called Layer-by-Layer (LbL) deposition, without an increase in volume implant because of the nanometric thickness of its layers. LbL coats the entire surface of individual cells, providing mechanical resistance to cells against manipulation and storage conditions prior to implantation in the patient. LbL is formed by polymeric layers or film depositions that are mediated by alternating opposite electrostatic interactions on a charged template. Using this technology, single-cell nanocapsule formation using human adipose-derived mesenchymal stem cells (ADSC) was assessed to determine the experimental factors to successfully preserve viability and functionality of cells in order to be used in regenerative medicine applications. For example, nanoencapsulation of mesenchymal stem cells (MSC) could be useful for cell targeting by conjugating a specific antibody, tissue engineering by incorporating a matrix protein that could be used as a scaffold and immune isolation when using multilayer nanoencapsulation. Thus MSC may serve as a promising platform for cell-based encapsulation in regenerative medicine, both for cellular therapy as well as for tissue engineering.

### Biography

Roberto Ebensperger is Associate Professor of Clinical Pharmacology and Director of the Laboratory of Cellular Therapy and Regenerative Medicine in the Pontificia Universidad Católica de Chile. He is Pharmacist and PhD in Biochemistry from the Universidad de Chile. He has had several Postdoctoral training in molecular cardiology at Medizinische Hochschule Hannover, hair follicle biology and pathology at Centre for Skin Sciences, University of Bradford, hematology and aging biology at Université Pierre et Marie Curie Paris VI. He was invited Professor at Equipe Biologie Cellulaire du Vieillessement, Université Pierre et Marie Curie. Currently, he is interested in mesenchymal stem cell applications in wound healing. In 2013 he founded Plasticel, a spin-off company that initiated R&D activities in applications for cellular therapy for plastic surgery and baldness.

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