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Advances in stem cell technology-hESC-derived beta-cells as a source for diabetes therapy

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During recent years the research development of human pluripotent stem cells has progressed vastly. Technical achievements have enabled generation of both in vitro products as well as in vivo applications. The tremendous possibilities of using stem cells in clinical therapy are promising and have created a growing interest in the pharmaceutical and biotech industry.

Type 1 Diabetes (T1D) is an autoimmune disease with an activated immune destruction of the insulin-producing beta-cells in pancreas, resulting in an insufficient production of insulin and, thus, causing hyperglycemia as a consequence. These patients are normally treated with a continuous administration of insulin-related drugs. In order to cure T1D patients, transplantation of islands of the Langerhans have been successfully performed, but the shortage of pancreatic donors do not meet the demands to fully apply as a therapy for T1D patients. Nevertheless, the successfulness of these transplantations serves as a proof of concept for beta-cell replacement and a requirement of an unlimited resource of beta-cells is highly desirable.

Novo Nordisk, a leader company in diabetes care, Cellectis Stem Cells, a pioneer in stem cell biotechnology, and Lunds University have since 2008 a joint program addressing the possibilities of generating insulin-producing beta-cells from human Embryonic Stem Cells (hESC). This presentation will focus on our strategy and current status of the project in differentiating hESC to beta-cells. Moreover, advancement in stem cell technology (e.g., generation, characterization, banking, mass production and differentiation) will be discussed and how this can be used for advancing also other areas of regenerative medicine.

Biography

Christian Andersson started as a senior scientist at Cellectis Stem Cells/Cellartis AB in January 2012. Andersson conducted his Ph.D. studies at the Dep. of Medical Biochemistry at the University of Gothenburg. After his dissertation, in December 2003, he started as a project leader at the Lundberg Laboratory for Diabetes Research at the University of Gothenburg.

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