Cell Therapy of Diabetes Mellitus: how far are we?

endothelium or the role of GATA-4 in liver fibrosis.

<u>Bernat Soria</u>, Centro Andaluz de Biología Molecular y Medicina Regenerativa (CABIMER), Sevilla and CIBERDEM, Barcelona.

Due to the high prevalence and cost of diabetes in Spain (more than 3.5 million people and about 6.000 million € of annual cost), diabetes has to be considered a Public Health problem. Diabetes describes a situation in which blood sugar is unregulated, is not a disease but a group of diseases. Type 1 is an autoimmune disease in which pancreatic B-cells disappear, whilst type 2 is a lifestyle caused disease with a progressive decrease in B-cell mass and peripheral insulin resistance. Additionally there are less frequent forms such as monogenic diseases (MODY) or gestational diabetes. In this Seminar we will explore the therapeutic possibilities of cell therapy in treating or alleviating diabetes and their complications, such as diabetic foot. Strategies:

- 1. Immunomodulation and blockade of the lymphocytic attack on the B-cell
- 2. Transplantation of insulin producing cells derived from pluripotent stem cells and expansion from resident islet cells.
- 3. Neovascularization (angiogenesis and vasculogenesis) to avoid amputation and recovery from critical ischaemia of the legs in diabetic and non-diabetic patients We will also discuss other strategies to generate vascular smooth muscle cells, corneal

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CLINICAL TRIALS:

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- 2. NCT01079403 (EudraCT: 2008-019774-33). "Use of adipose-derived mesenchymal stem cells as cell regeneration therapies in the critical ischaemia of the limbs in diabetic patients"
- 3. EuDraCT: 2010-019774-33. "Use of stem cells in cell therapy of critical ischaemia of the limbs in type 2 insulinised patients"
- 4. NCT01056471 (EudraCT 2008-004015-35: "Safety and feasibility of multiple doses of adipose derived mesenchymal stem cells in multiple sclerosis"