CellR4 2014; 2 (4): e1150

In Vivo Assessment of Human Islet Potency

R.D. Molano, R. Ricordi, A. Pileggi

Cell Transplant Center, Diabetes Research Institute, University of Miami, Miami, FL, USA

Corresponding Author: Camillo Ricordi, MD; e-mail: ricordi@miami.edu

Abstract

Transplantation of insulin-producing cells into immunodeficient mice represents an important tool for the assessment of viability and function of cellular products intended to restore beta cell function in the clinical and research applications. The in vivo bioassay allows for the assessment of the ability of the cellular product to restore and maintain euglycemia in vivo after transplantation into chemically-induced diabetic recipients. Herein we describe the protocol utilized for the in vivo potency assessment of human islet cell products. Modifications of the protocol enable the use of the bioassay for the potency assessment of human or animal insulin-producing cells from adult, neonatal or fetal sources or generated from stem cells.

Acknowledgements

This work was supported in part by National Institute of Health - NCRR grants for General Clinical Research Center MO1RR16587, NIDDK 1R01-DK55347-IU42RR016603, 5R01DK25802-24, 5U01DK70460-02, 5U42RR016603-08S1, 5R01DK025802-23, Islet Cell Resources grant 5U42RR016603, 5R01DK56953-05, and Clinical Islet transplant Consortium grants U01DK 070460 and 1UL1TR000460; the Juvenile Diabetes Research Foundation International grants 17-2012-361, 17-2010-5, 4-2008-811, 4-200-946 and 4-2004-361; and the Diabetes Research Institute Foundation (www.DiabetesResearch.org). The authors are grateful to the members of the Human Cell Processing Facility, of the Preclinical Cell Processing and Translational Models Core, the Cell Transplant Center, of the Clinical Islet Transplant Program, General Clinical Research Center, of the Imaging Core at the Diabetes Research Institute, and of Administrative Offices at the Diabetes Research Institute and of the Organ Procurement Organizations for the continuous enthusiasm and support to our program.