

The Institut de Recerca Sant Joan de Déu-Hospital Sant Joan de Déu (IRSJD) is seeking an Experienced Researcher to carry out a project on Type 1 Diabetes. Candidates should hold a PhD in Biological Sciences (Biomedicine, Biochemistry, or similar).

REFERENCIA: 245-17

Project Title and abstract

Encapsulated Synthetic Cellular Circuits to Restore Glycemic Control in Type 1 Diabetes

Diabetes is a global epidemic with a major impact in health and economy. Despite the enormous efforts devoted during decades to develop new treatments, very limited success have been achieved with treatments beyond the regular administration of exogenous insulin. To improve quality of life for individuals with diabetes, alternative treatments need to be established. Synthetic biology is emerging as a new biology-based technology that holds promise to revolutionize medicine. Taking inspiration from electronics, synthetic biology has succeed in developing biological devices that can perform simple desired computations, showing the way towards a future where biological synthetic circuits could be used in technological and medical applications. Here, based on our knowledge in the generation of cellular circuits, we propose to create synthetic gene circuits in single or multicellular consortia amenable for encapsulation that can regulate glucose levels by creating a hormone balance with potential application for the treatment of type 1 diabetes. We will use mathematical modeling in combination with synthetic biology approaches to design to create optimal genetic circuits for optimal balance of hormone secretion in response to changes in glucose levels. Those circuits will produce insulin or glucagon to maintain the proper homeostasis of glucose in blood. We will fabricate and optimize cell-loaded 3D microcapsules for its application in diabetes. Encapsulated cell circuits will be used for the in vivo treatment of a type 1 diabetes model. Based on quantitative and qualitative analyses of the dynamic response to glucose, further evolution and optimization will be carried out. We expect to deliver a new cellular device for therapeutic use able to respond to changes in glucose and produce insulin or glucagon to properly adjust blood glucose homeostasis.

The role

The researcher will lead in vivo treatments of type 1 diabetic animals by using 3D microcapsules, developed in collaborations with F Posas (Universitat Pompeu Fabra) and Gorka Uribe (Universidad del País Vasco). The candidate will work independently and will be encouraged to apply for his/her own grants to grow as an independent researcher within the Endocrine Division of the IRSJD.



Sant Joan de Déu
Institut de Recerca

Who would we like to hire?

Qualified individuals who are highly motivated, self-driven, independent, and proficient in English and have a solid publication record.

Desirable but not required

Previous experience working with animal models of type 1 diabetes (STZ-treated, NOD), beta-cell function and/or regeneration will be positively evaluated.

The Offer

Duration: 2 years

Estimated annual gross salary: A competitive salary will be provided, based on professional experience.

Starting date: 01/01/2018.

We offer work in a highly stimulating environment with state-of-the-art infrastructures, providing the successful applicant with unique professional career opportunities.

Application Procedure

All applications must include:

A presentation letter addressed to Dr. Diaz Naderi and Dr. Josep C Jimenez-Chillaron.

A full CV including contact details.

Two contacts for further references.

All applications must be submitted to rrhh@fsjd.org

Deadline: Please submit your application by September 31st 2017

The contract will be financed by La Marató TV3.

Job Type: Full-time