The highly calcium-sensitive pool of granules in biphasic insulin secretion: Experimental and theoretical investigations

Fact Sheet

Project Information

HCSP IN BETA-CELLS
Grant agreement ID: 252981
Status
Closed project
Start date 1 June 2010
End date 12 January 2012

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FP7-PEOPLE
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EU contribution € 136 002,05

Coordinated by
LUNDS UNIVERSITET
Sweden

Objective

Insulin is released from the pancreatic beta-cells in a biphasic manner in response to a step in the ambient glucose concentration, and the loss of first-phase secretion is an early marker of diabetes. Studies have shown that there exist pools of insulin secretory granules with different calcium sensitivities. The project will study the nature, regulation and role of the highly calcium-sensitive pool (HCSP) in pancreatic beta-cells. Special focus will be on its relation to "newcomer granules", which fuse shortly after arriving to the membrane, during biphasic insulin secretion. We will apply a combination of well-established experimental methods such as patch-clamp techniques, life confocal and TIRF imaging, in novel combinations with knock-down of key exocytotic proteins, in particular Syntaxin and Synaptotagmin. The experimental part will be complemented and supported by modelling studies, building on our recently published model, which identified the HCSP with newcomer granules.
This interdisciplinary project will test the model experimentally, and vice versa, use the model to suggest key experiments. The suggested work will complement the theoretical training of the fellow with hands-on experience.

Field of science
/natural sciences/chemical sciences/inorganic chemistry/inorganic compounds
/medical and health sciences/clinical medicine/endocrinology/diabetes
/natural sciences/biological sciences/biochemistry/biomolecules/proteins

Programme(s)

Topic(s)

Call for proposal
FP7-PEOPLE-2009-IEF

Funding Scheme
MC-IEF - Intra-European Fellowships (IEF)

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Activity type
Higher or Secondary Education Establishments

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€ 136 002,05

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