(light)
PhD seminar

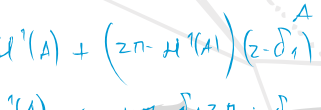
12th July 2018, 17:30
Seminar Room, BCAM

Integrated Oscillator Model for Pancreatic β-cells: Analysis of the Transitions Between Bursting Modes

Isabella Marinelli (BCAM)

Intracellular Ca^{2+} oscillations and pulsatile insulin secretion are results of bursts of electrical impulses produced by insulin-secreting β-cells of pancreatic islets of Langerhans. Recently, mathematical modelling have been focused on the mechanism for this bursting activity and, as new data are acquired, old models are modified and new models are developed. Comprehensive models must now account for the various modes of bursting observed in islet β-cells (fast bursting, slow bursting, and compound bursting).

The Integrated Oscillator Model (IOM) is one such model. In this model, β-cell electrical activity, intracellular Ca^{2+}, and glucose metabolism interact via numerous feedforward and feedback pathways, and produce metabolic oscillations with sawtooth or pulsatile time course, reflecting very different oscillation mechanisms. In this study, favourable conditions are determined to one type of oscillations or the other; the transitions between modes of bursting and the relationship of the transitions to the patterns of metabolic oscillations are analysed. Importantly, this work suggests pathways through which oscillations of one type can be converted to oscillations of another type and clarifies what can be expected in experimental measurements of β-cell oscillatory activity.



basque center for applied mathematics

eman ta zabal zazu
Universidad del País Vasco
Euskal Herriko Unibertsitatea

LIGHT PhD Seminar is a space for students to share their work with other students and to rehearse public presentations.
If you want to participate, contact us at:
lightseminar@bcamath.org