Beta Cell Interest Group (BIG) Seminar

VANDERBILT UNIVERSITY labnodes

Current and ongoing beta cell research is presented in this weekly seminar by faculty, postdoctoral fellows and students. If you are interested in attending the Beta Cell Interest Group (BIG) seminars and joining the BIG community, please contact David Jacobson.

Keywords: beta cell BIG

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Meeting Details

Start Date / Time	February 18, 2015 at 9:00 AM
End Date / Time	February 18, 2015 at 9:55 AM
Duration	55 minutes
Location	512 Light Hall
Presenter Name	Xiaodong Zhu (Kaverina lab)
Presentation Title	Microtubules negatively regulate insulin secretion in pancreatic β cells
Status	This meeting has already occurred

Meeting Agenda/Notes

Glucose-stimulated insulin secretion (GSIS) from pancreatic β cells has to be tightly regulated to maintain glucose homeostasis. A hypothesis that microtubules (MTs) transport insulin granules to exocytic sites has been a matter of debate. Here, we report that MTs regulate insulin secretion by restraining excessive delivery of insulin granules to the plasma membrane. We found that MTs in β cells emerge from the Golgi and form a meshwork that anchors insulin granules . Furthermore, we show that instead of directional transportation, insulin granules are randomly walking in the cytoplasm. Both actin and MTs contribute to such movement. Interestingly, MT depolymerization facilitates delivery of insulin to the cell membrane and dramatically enhances GSIS, suggesting that MTs withhold granules away from secretion sites and that glucose induces dynamic MT turnover for GSIS to occur. Our results demonstrate that MTs act as a cellular “rheostat” for precisely metered insulin secretion, which is tuned by modulating MT density and dynamics.