Beta Cell Interest Group (BIG) Seminar

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	October 29, 2014 at 9:00 AM
End Date / Time	October 29, 2014 at 9:55 AM
Duration	55 minutes
Location	512 Light Hall
Presenter Name	Nathaniel Hart (Powers)
Presentation Title	Age-related changes in islet cell composition, proliferation, and mass in human pancreas
Status	This meeting has already occurred

Meeting Agenda/Notes

Reduced pancreatic β-cell mass is a hallmark of type 1 diabetes and a decline in pancreatic β-cell mass can also be associated with type 2 diabetes. β-cell mass in non-diabetic adult humans varies by as much as 3-5 fold and thus, differences in islet cell mass may influence diabetes susceptibility. However, the basis of postnatal islet development and determinants of adult islet cell mass in humans are poorly understood. To investigate pancreatic islet cell composition, mass, and proliferation in early life, we systematically analyzed cross-sections from three regions (head, body, tail) of the whole pancreas from 17 human juvenile donors (1 day to 10 years of age) by multicolor immunofluorescence, whole slide imaging, and an automated cell-counting algorithm. The β-cell and α-cell populations (relative to the total α-, β-, δ-cell pool) increased, and the δ-cell population decreased. β-cell mass, α-cell mass and δ-cell mass increased gradually with age, with the largest gain between 7-20mo and 4-10y. Although the α- and β-cell proliferation was variable between donors, the mean Ki67 labeling index of α-cells and β-cells was higher, with Ki67+ α-cells more frequent than Ki67+ β-cells, in donors £ 20mo of age. These results indicate that human islet cell composition, mass, and proliferation are dynamic in the first decade of life and suggest that postnatal human islet development may be a crucial determinant of adult islet cell mass.