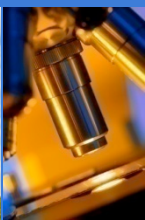


β -cells persist in some T1DM pancreata without evidence of β -cell turnover nor insulin-glucagon co- expression

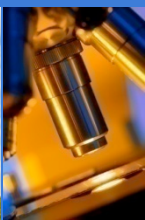
Daniel R. Jacobson, Matthew M. Rankin, Alisa B. Schiffman,
Changhong Li, Jake A. Kushner



β -cell function persists in T1DM patients,
even in some with longstanding disease

What is the developmental mechanism of
functional β -cell persistence?

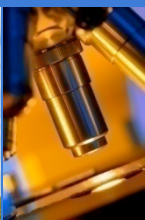
We used high throughput imaging
techniques to acquire and quantify β -cell
mass and turnover, and islet composition



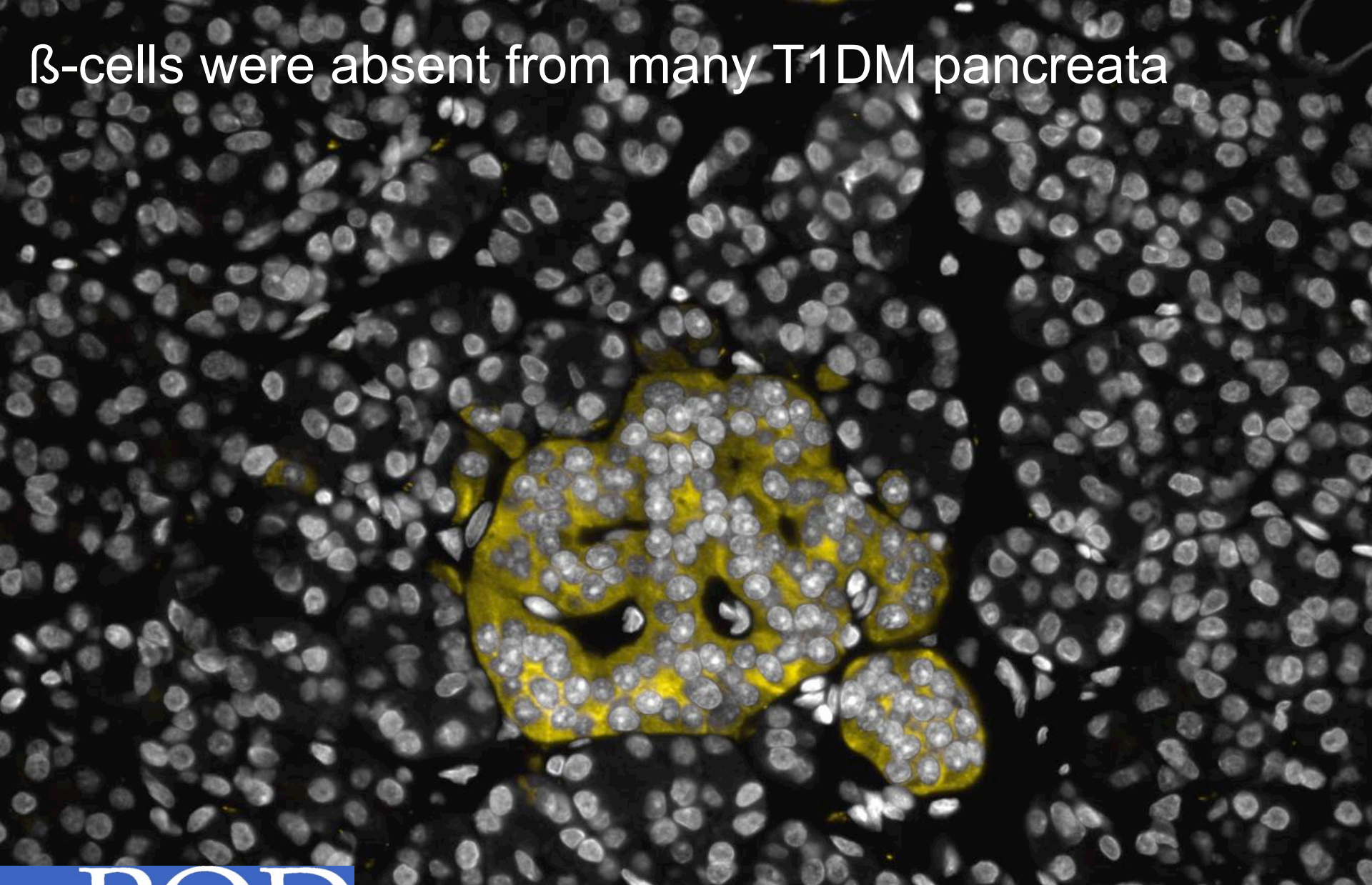
Do β -cells persist in T1DM pancreata?



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β -cells were absent from many T1DM pancreata



nPOD 6033 (40 year old, T1DM 28 years)

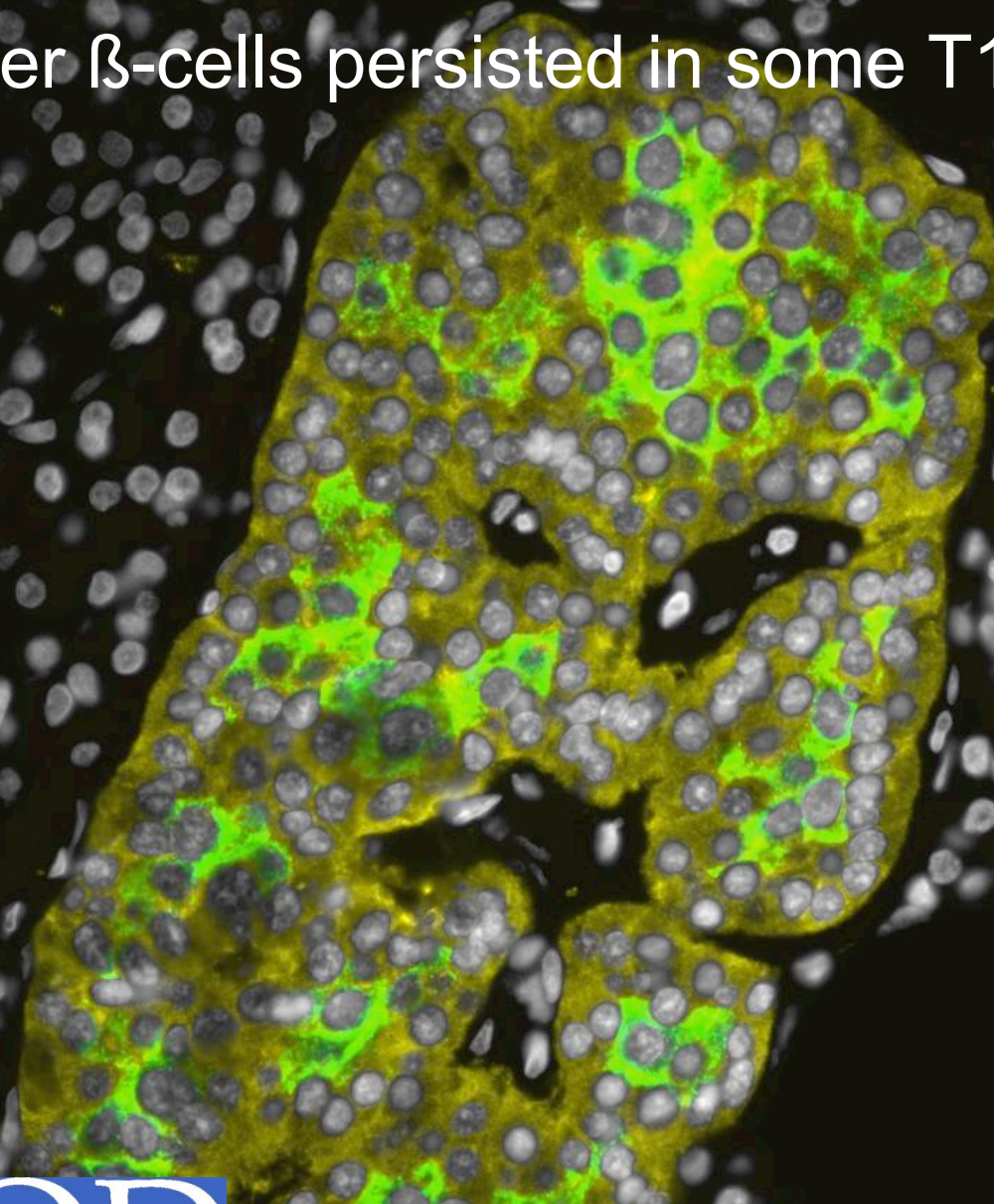
DAPI Insulin Synaptophysin

β -cells were absent from many T1DM pancreata

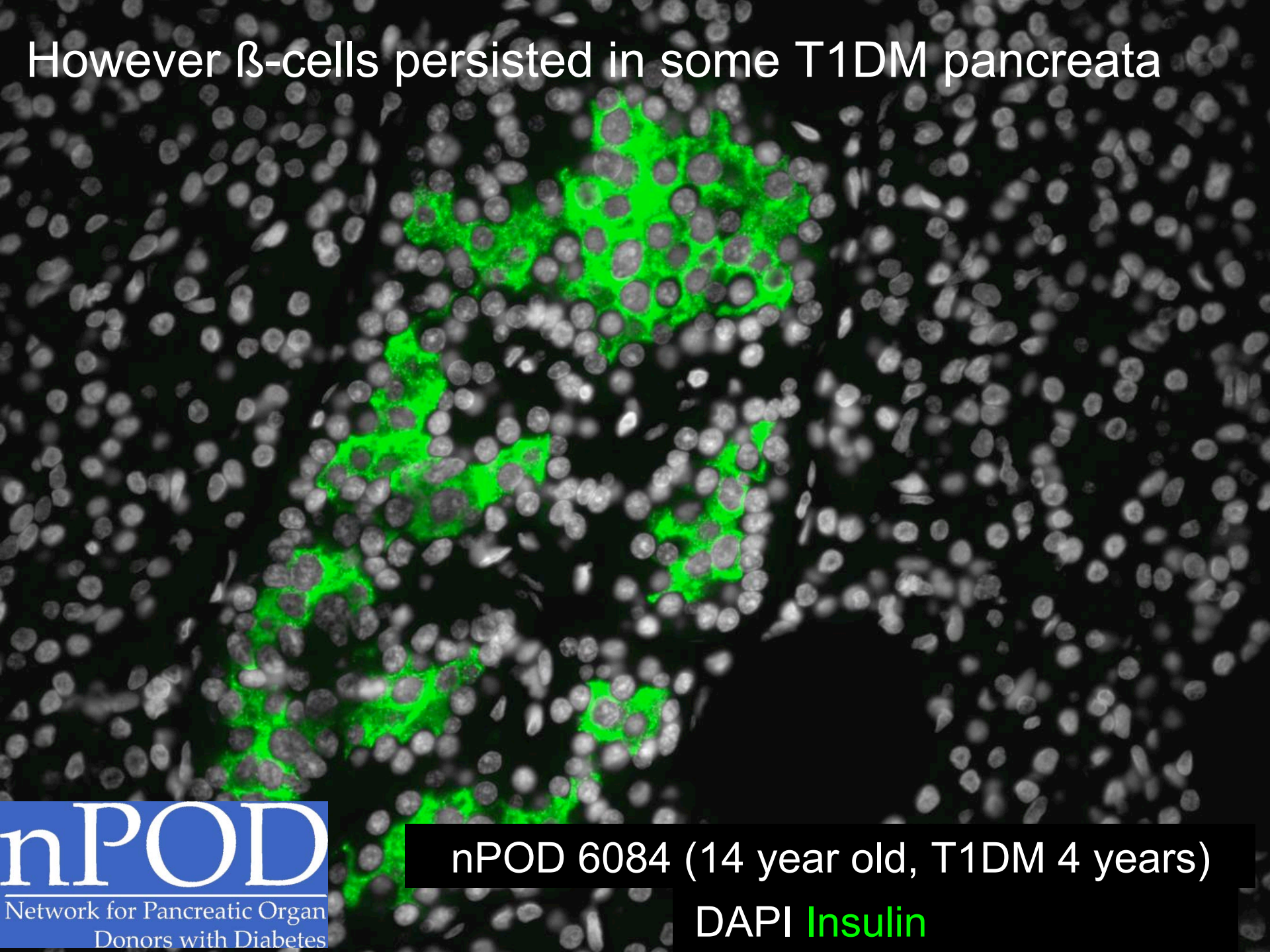
nPOD 6033 (40 year old, T1DM 28 years)

DAPI **Insulin**

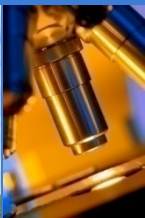
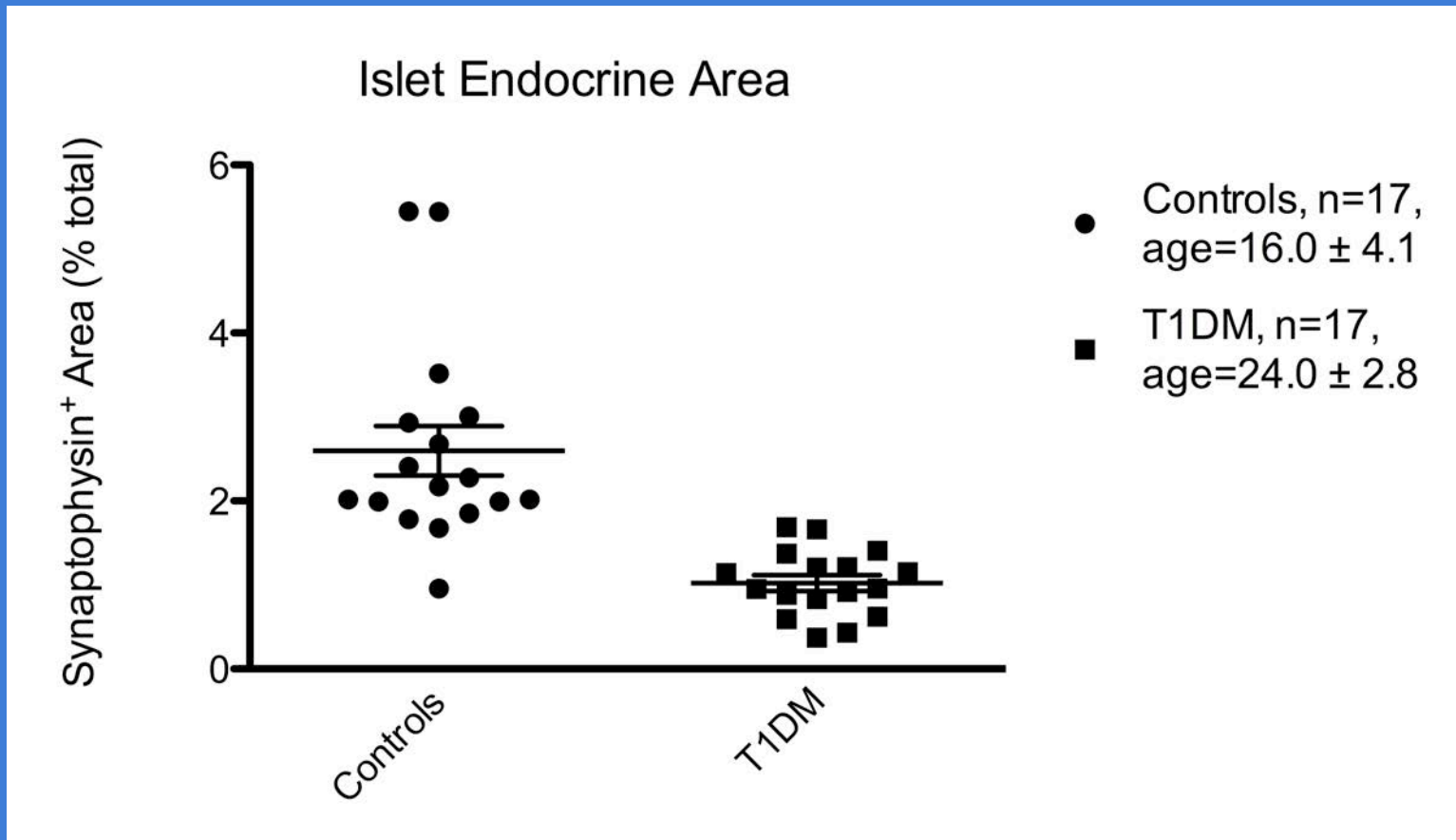
However β -cells persisted in some T1DM pancreata



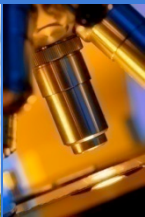
However β -cells persisted in some T1DM pancreata



Islet endocrine area is also reduced in T1DM pancreata



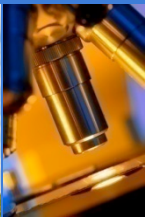
What is the developmental basis for persistence of β -cell function in T1DM?



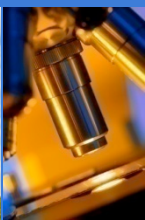
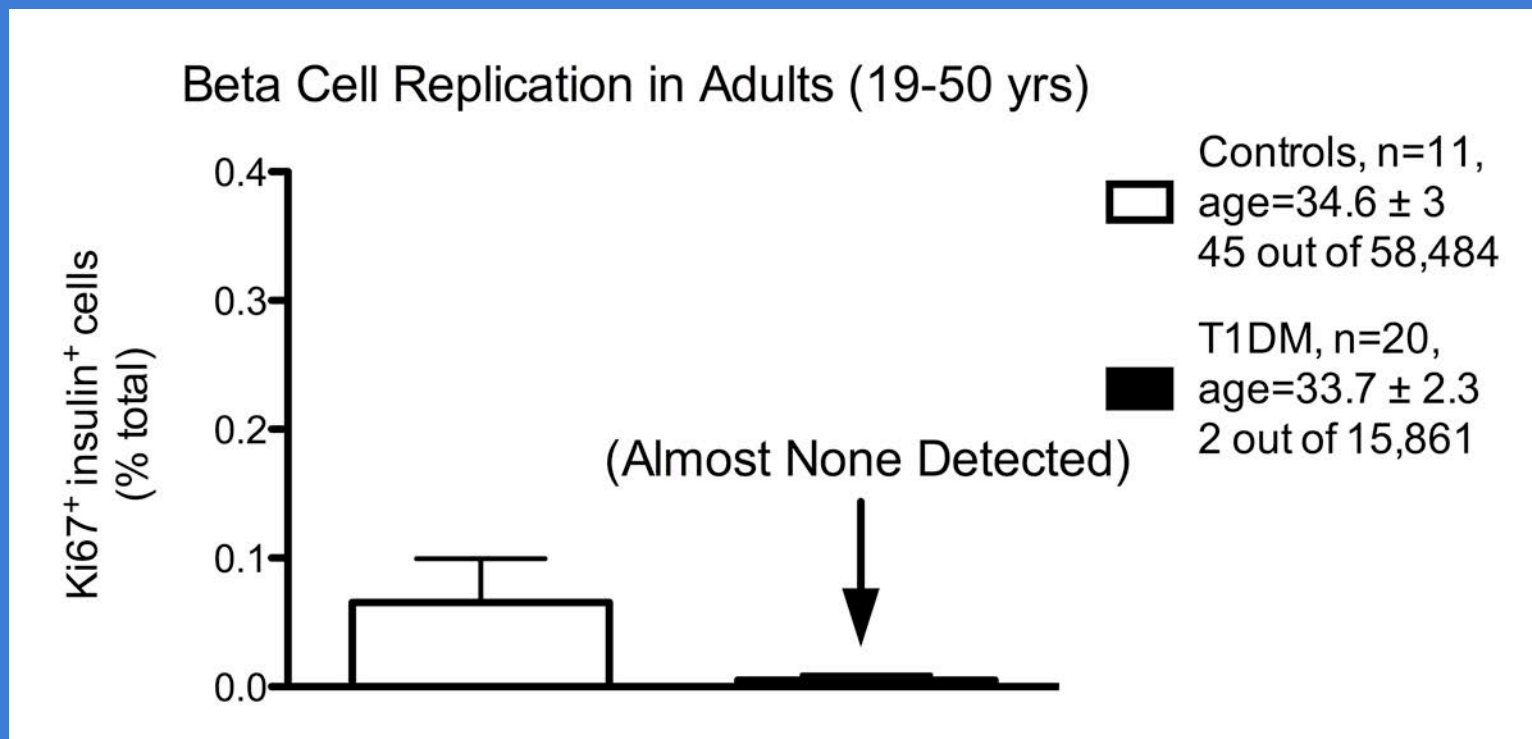
Is β -cell replication increased in T1DM
pancreata?



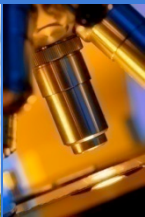
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No! β -cell replication is extremely low in control pancreata and actually reduced in T1DMs



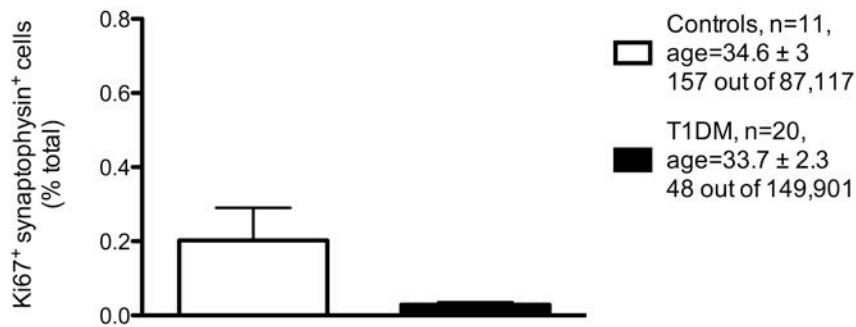
Is islet endocrine cell replication altered in T1DM pancreata?



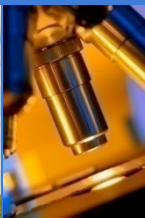
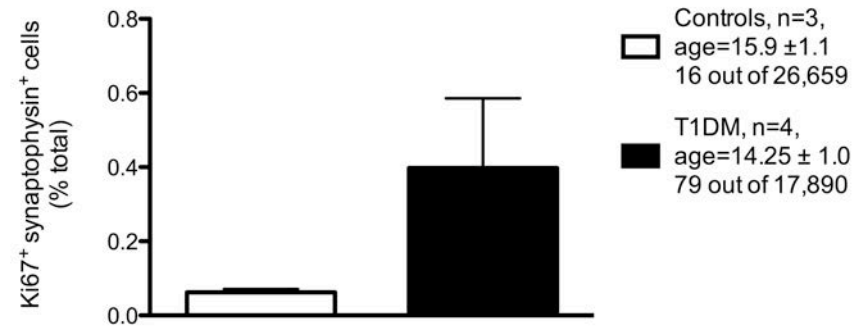
Islet endocrine replication is reduced in adult T1DM pancreata

However, adolescent islet endocrine cell replication is strongly increased!

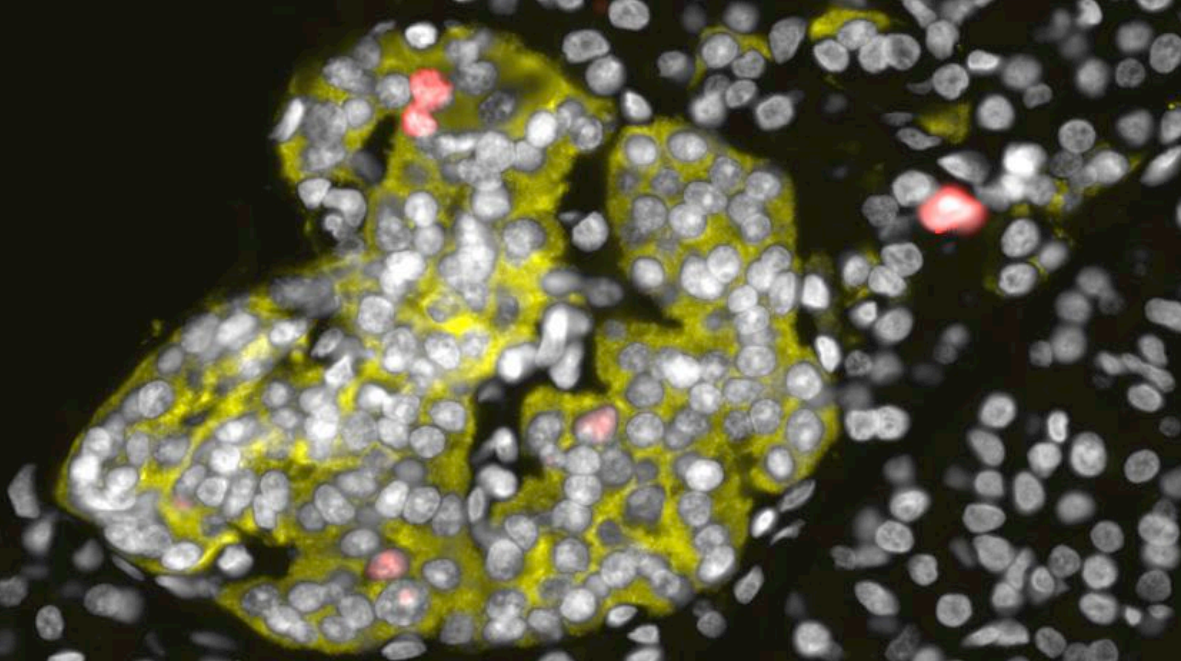
Islet Endocrine Cell Replication in Adults (19-50 yrs)



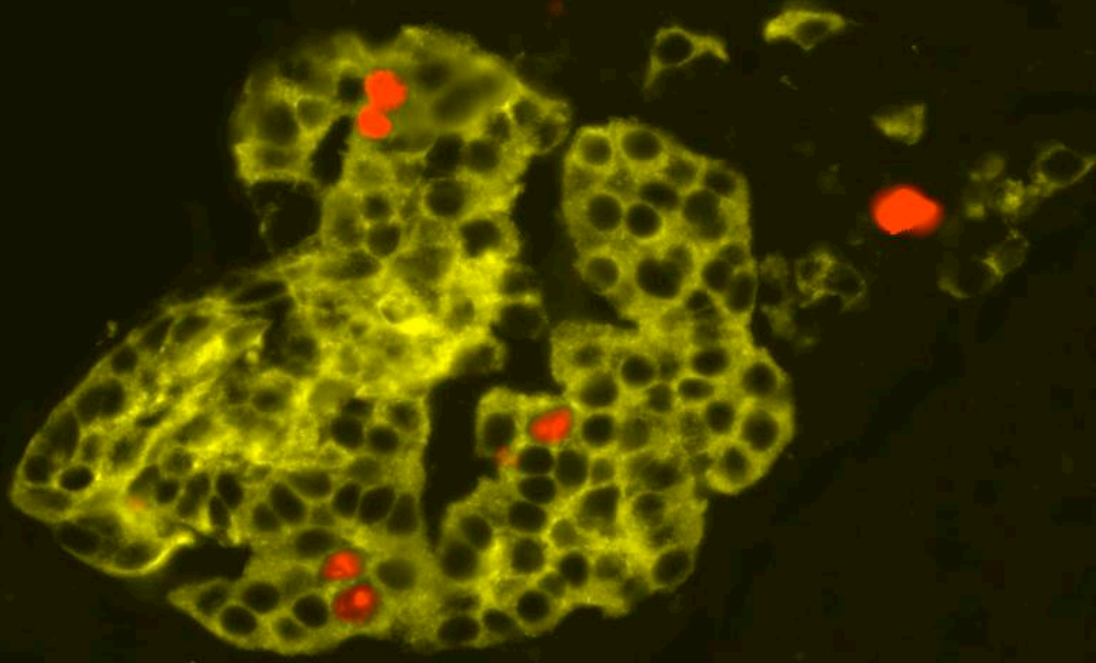
Islet Endocrine Cell Replication in Adolescents (11-18 yrs)



Islet endocrine cells replicated in some adolescent T1DM pancreata



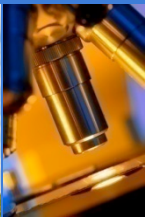
Islet endocrine cells replicated in some adolescent T1DM pancreata



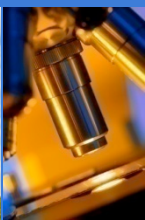
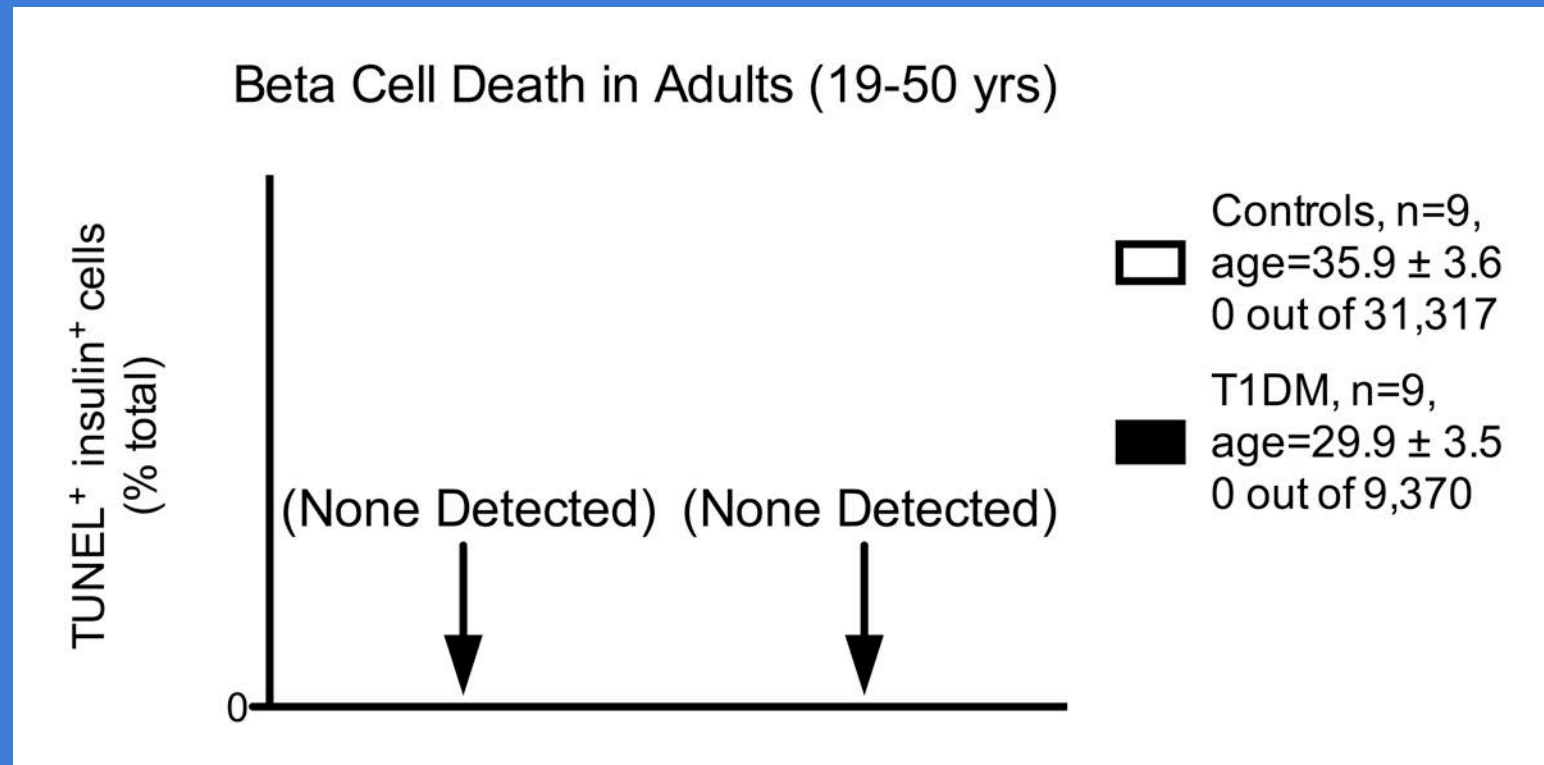
Is β -cell death increased in T1DM pancreata?



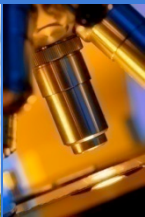
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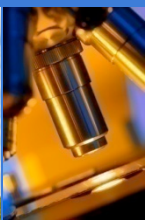
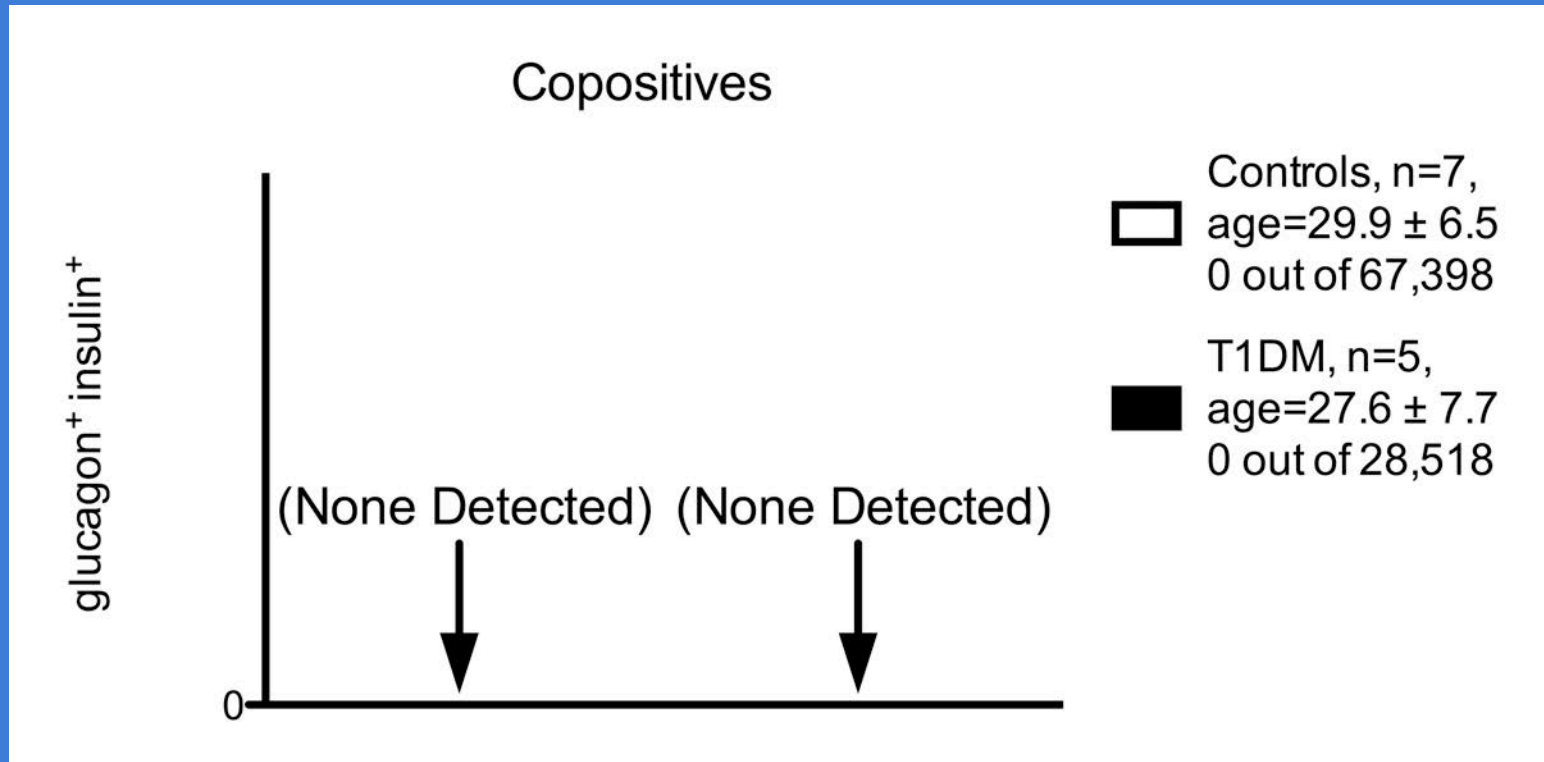
β -cell death was virtually undetectable in both Control and in T1DM pancreata



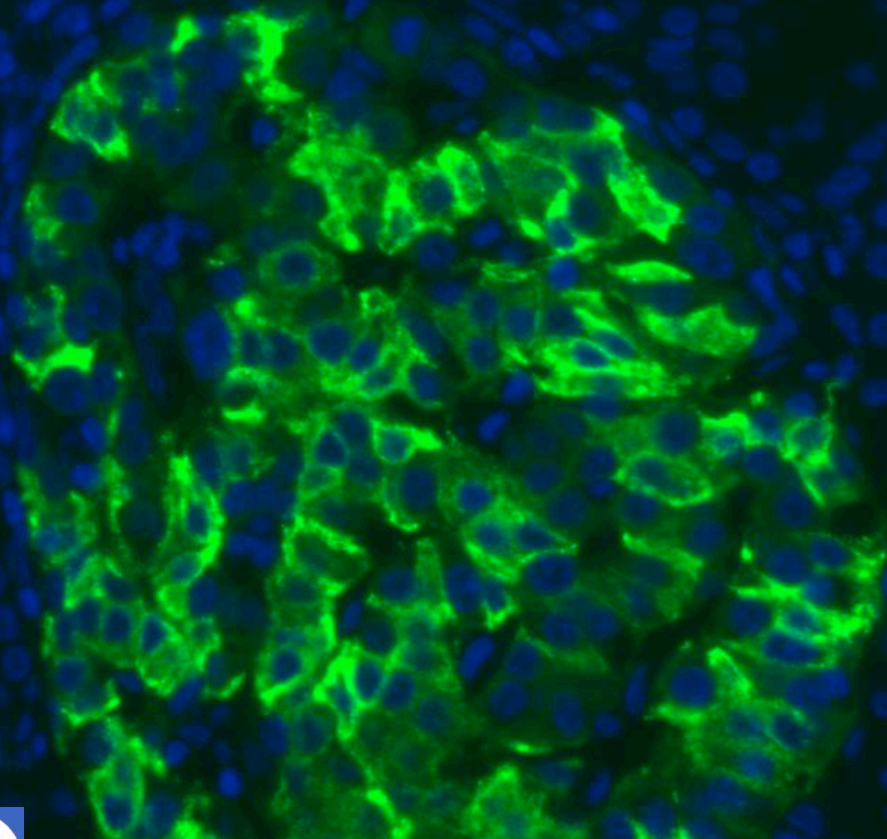
Where do persistent β -cells come from?
Could α -cells transdifferentiate into β -cells
in T1DM pancreata?



No! α -cells do not co-express insulin and glucagon in T1DM pancreata



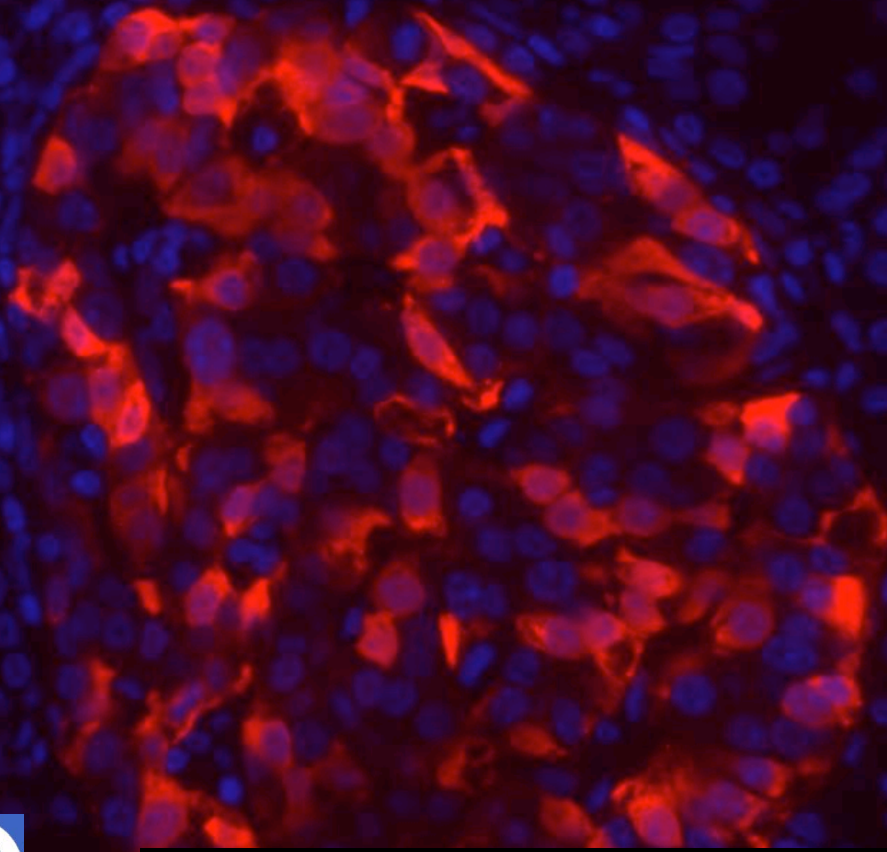
α -cells do not co-express insulin and glucagon in T1DM pancreata



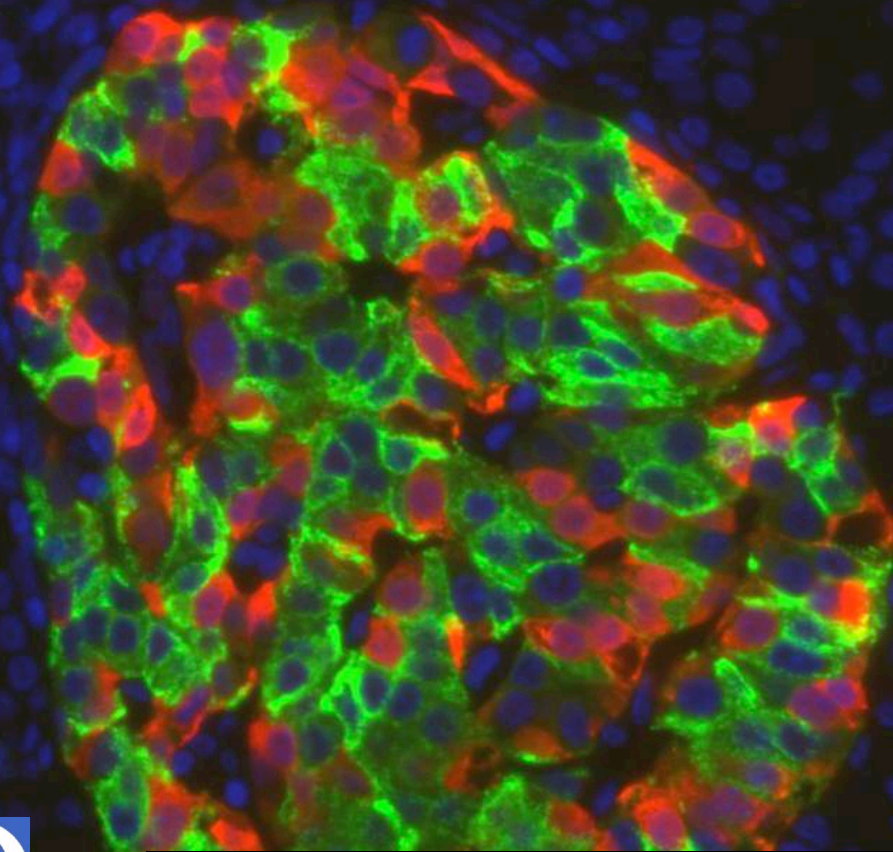
nPOD 6052 (12 year old, T1DM 1 years)

DAPI Insulin

α -cells do not co-express insulin and glucagon in T1DM pancreata



α -cells do not co-express insulin and glucagon in T1DM pancreata

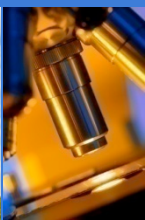


nPOD 6052 (12 year old, T1DM 1 years)

DAPI Insulin Glucagon

Summery

- β -cells persist in some T1DM pancreata.
- β -cell and islet endocrine cell area is reduced in T1DM pancreata.
- T1DM pancreata exhibit very little β -cell replication or death.
- α -cells do not transdifferentiate into β -cells.



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The Texas Children's Diabetes and Endocrinology Center

