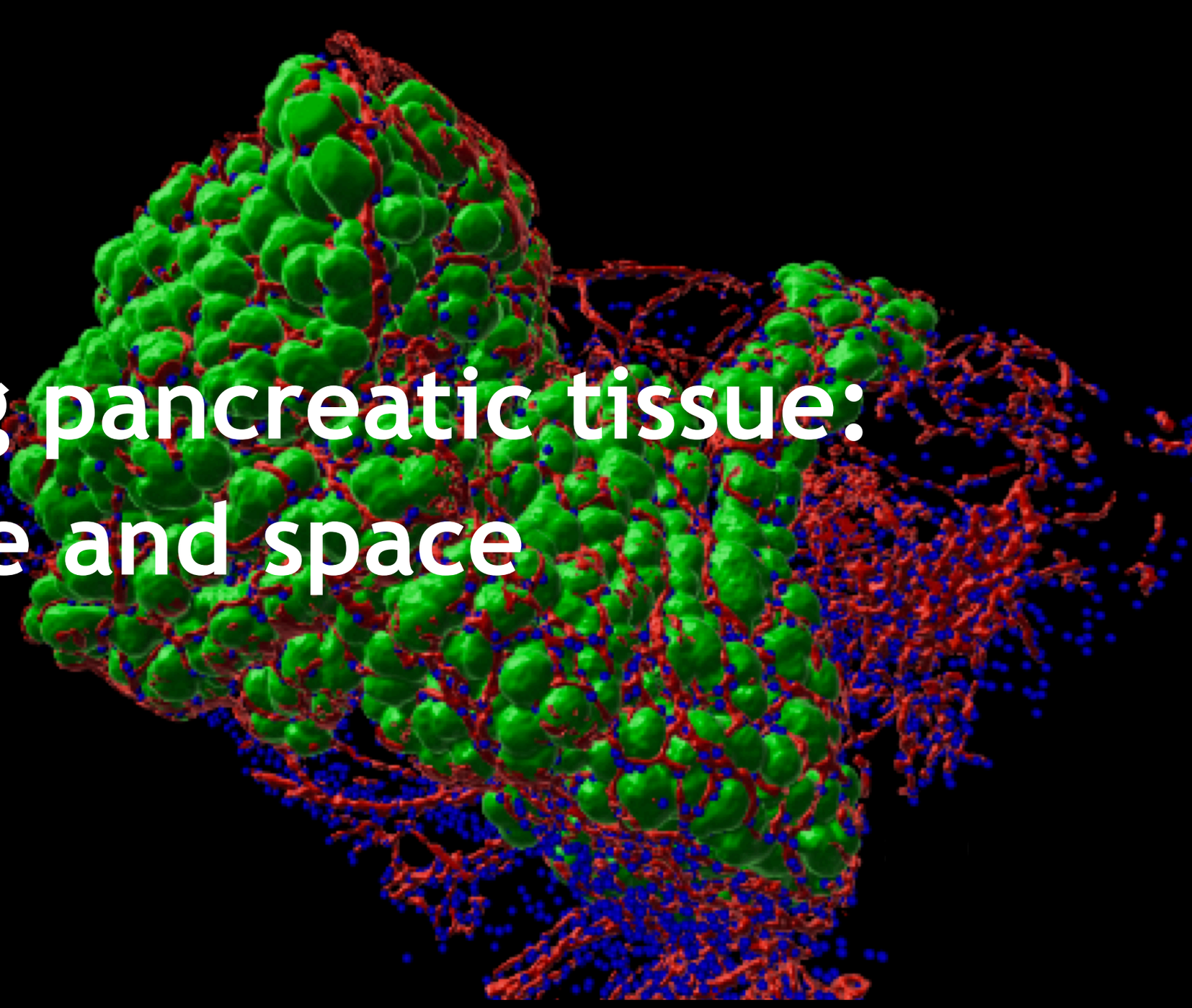


Engineering pancreatic tissue: cells in time and space

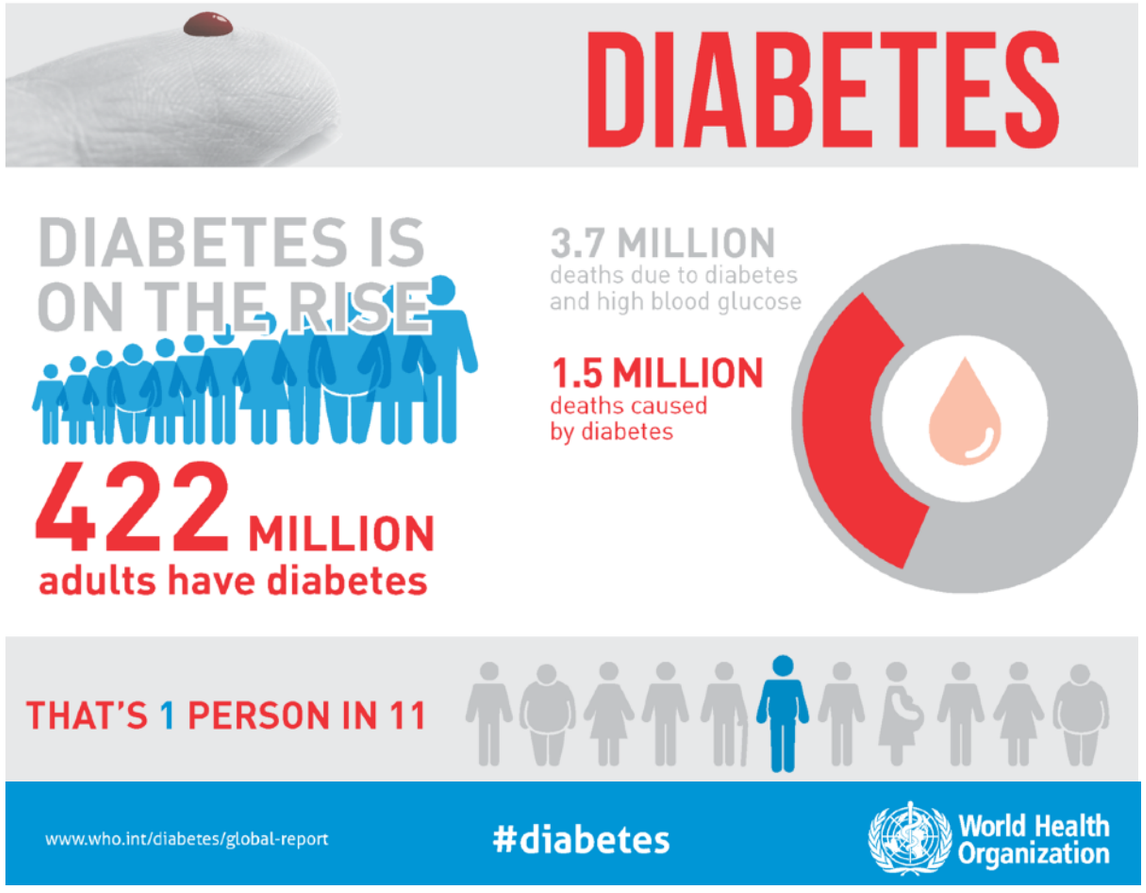
Francesca M. Spagnoli

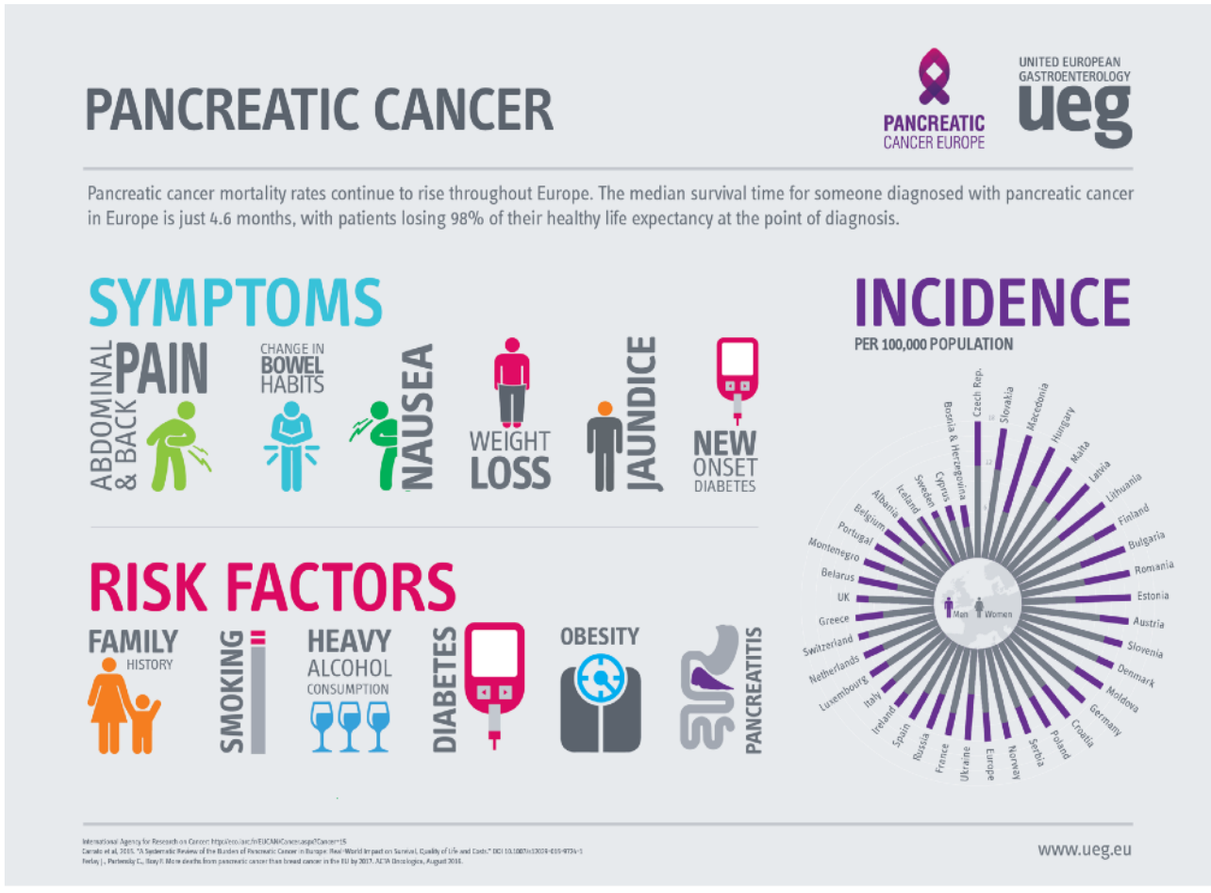
EIC | ERC Workshop

29.06.2021

https://www.pan3dp-project.eu/

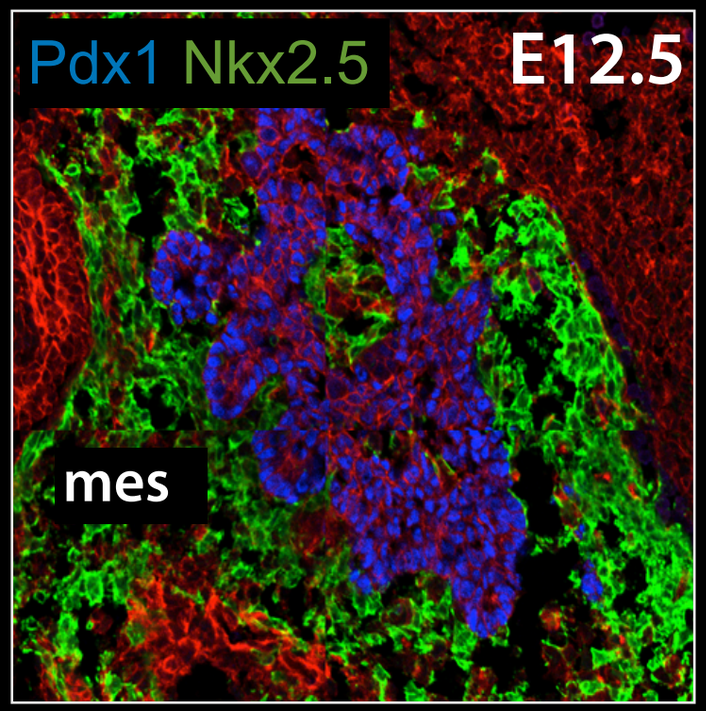
Pancreatic Diseases

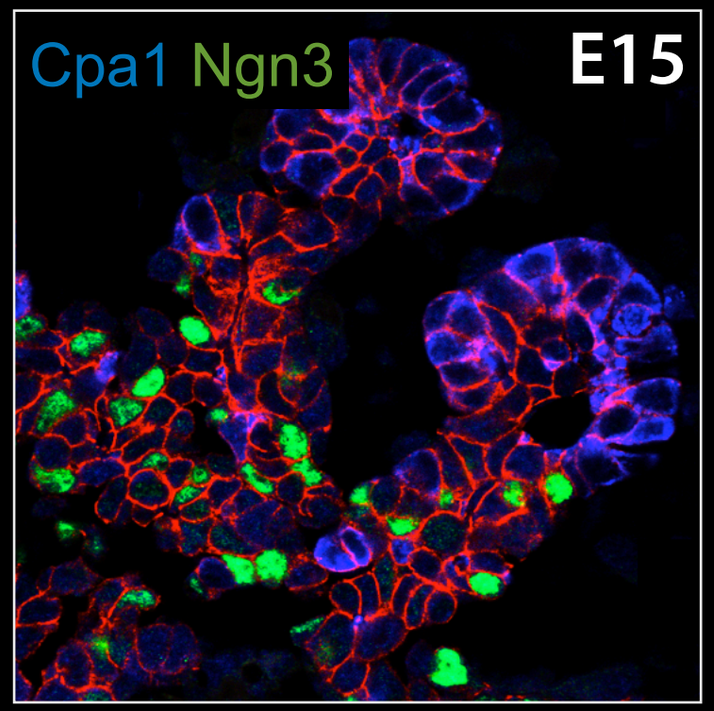


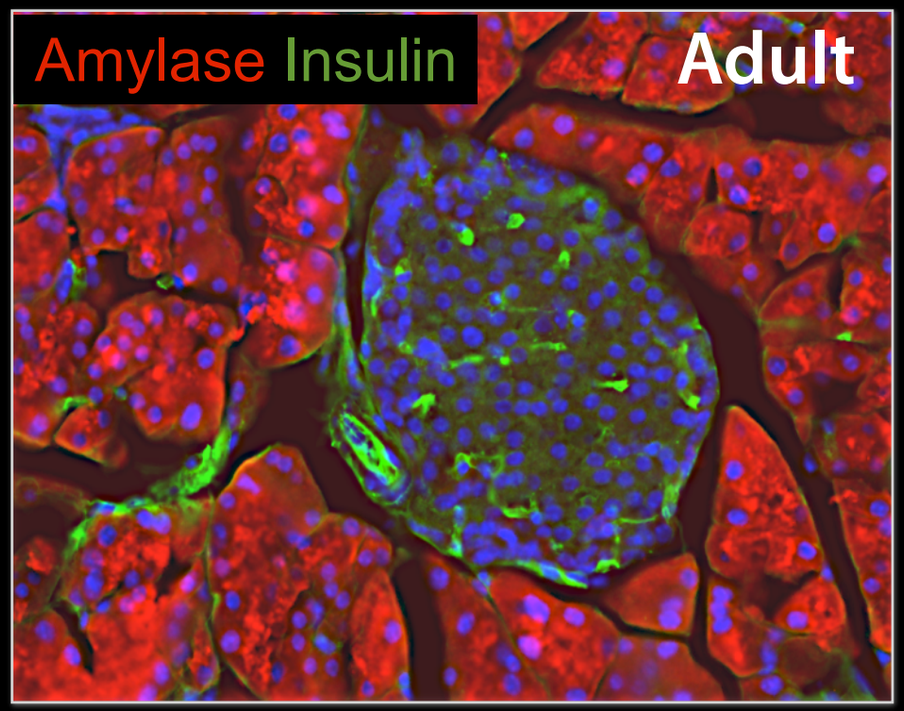


> Islet transplantation is a functional therapy to cure diabetes

Engineering cells with a developmental logic

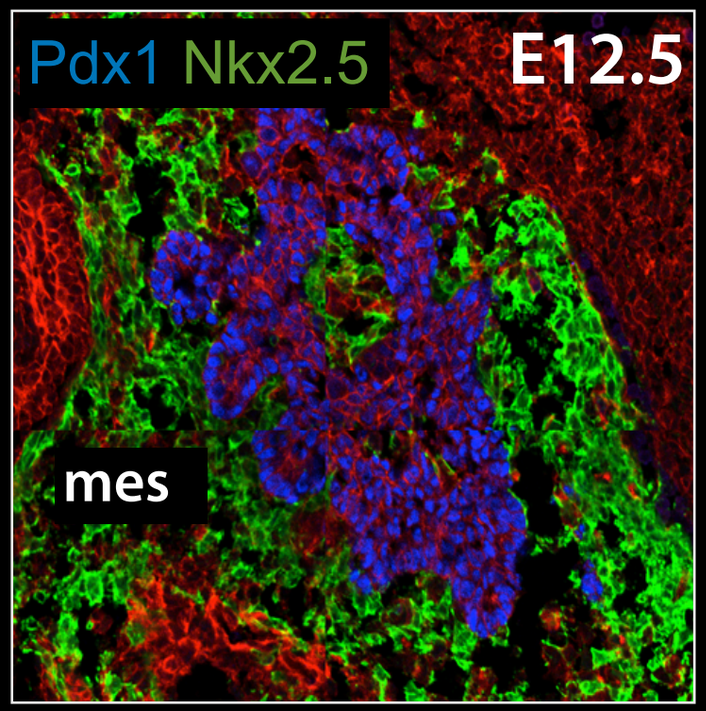


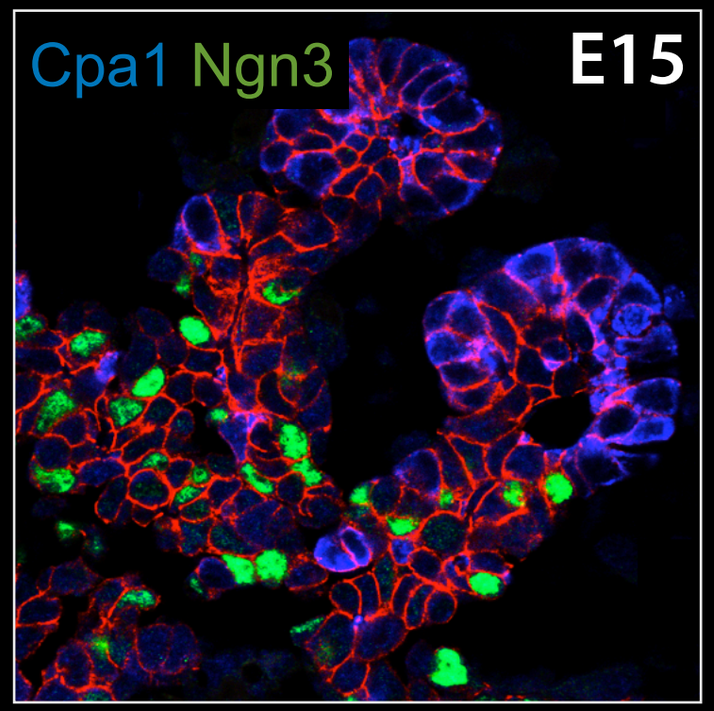


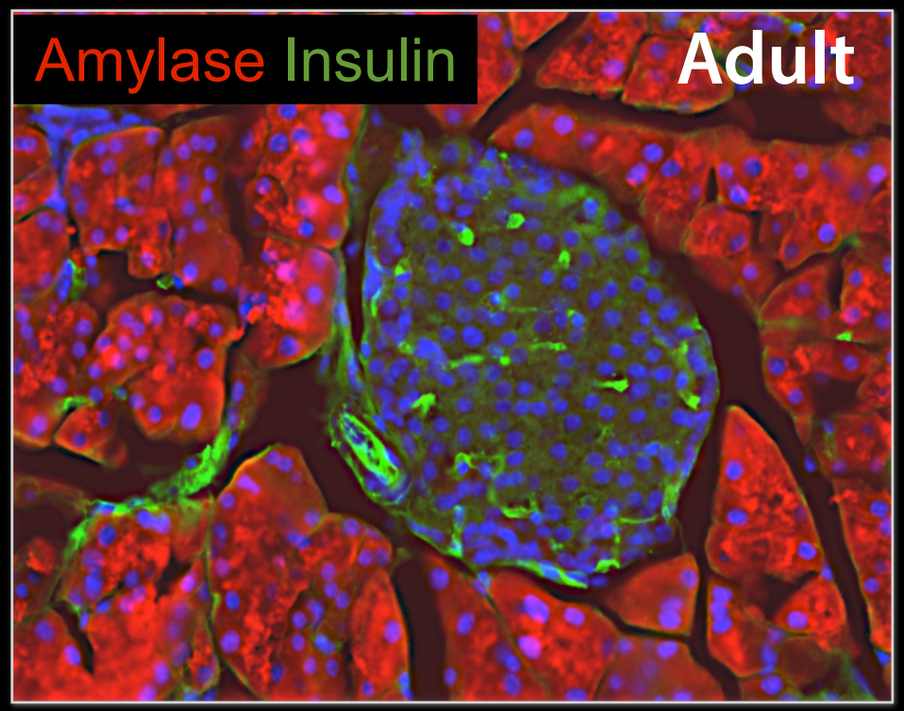


Rodriguez-Seguel et al. ***Genes Dev.*** 2013
Petzold, Naumann, Spagnoli FM. ***Development*** 2013
Cerdá-Esteban et al. ***Nat Commun.*** 2017
Escot et al. ***Nat Commun.*** 2018
Cozzitorto et al. ***Dev Cell*** 2020
Willnow et al. ***Nature*** in press

Engineering cells with a developmental logic







> Defining autologous renewable sources of pancreatic cells (ERC)

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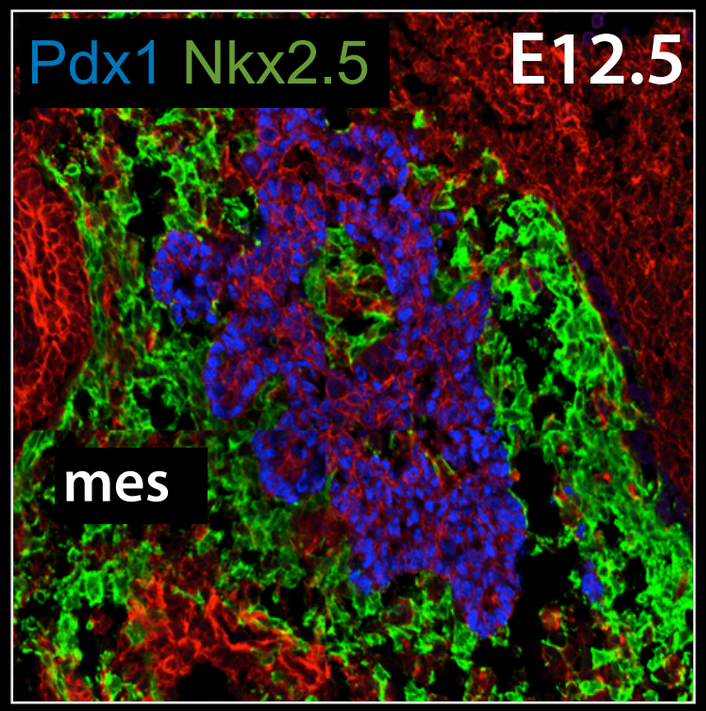
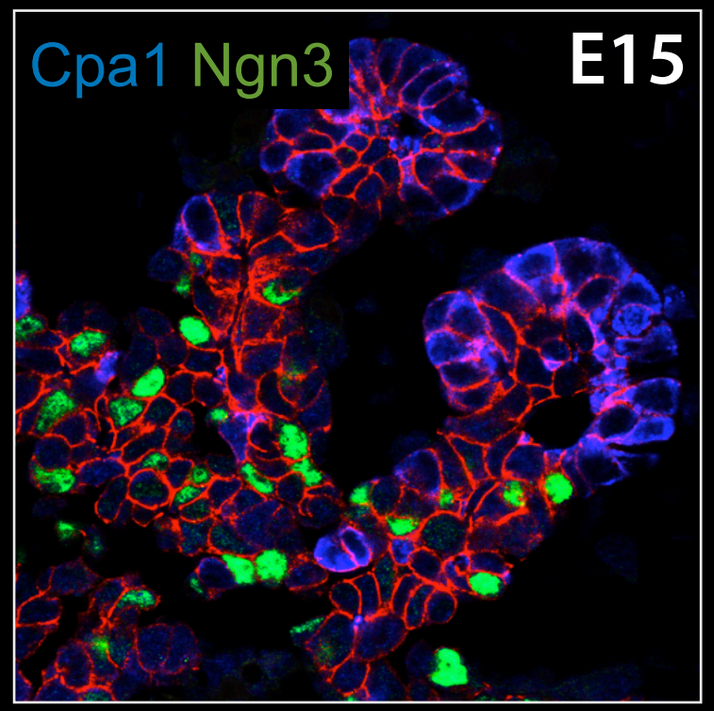
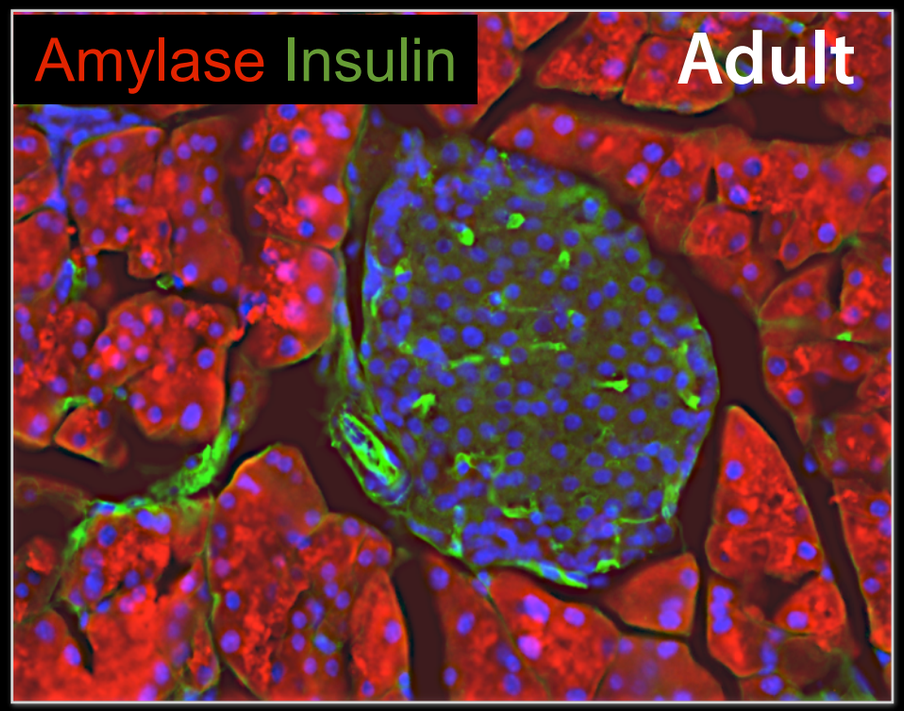
Engineering cells with a developmental logic







> Defining autologous renewable sources of pancreatic cells (ERC)

> Mimicking the microenviroment to make *more and better* pancreatic cells

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Petzold, Naumann, Spagnoli FM. ***Development*** 2013
Cerdá-Esteban et al. ***Nat Commun.*** 2017
Escot et al. ***Nat Commun.*** 2018
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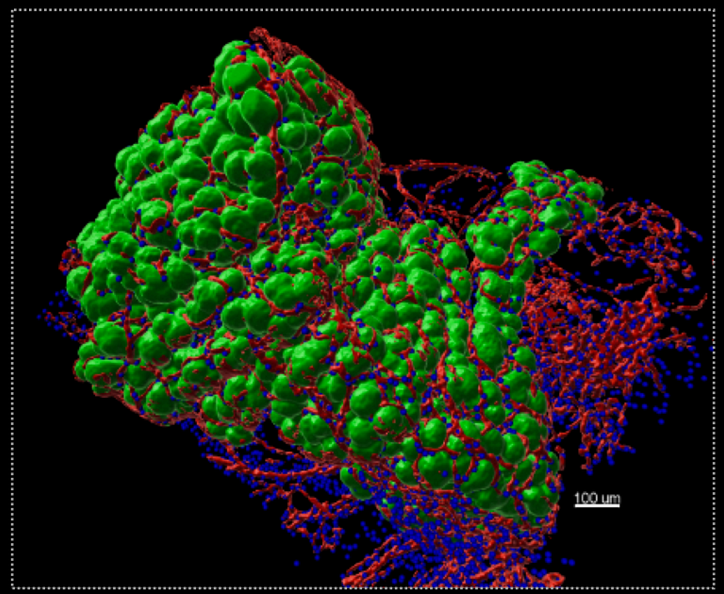
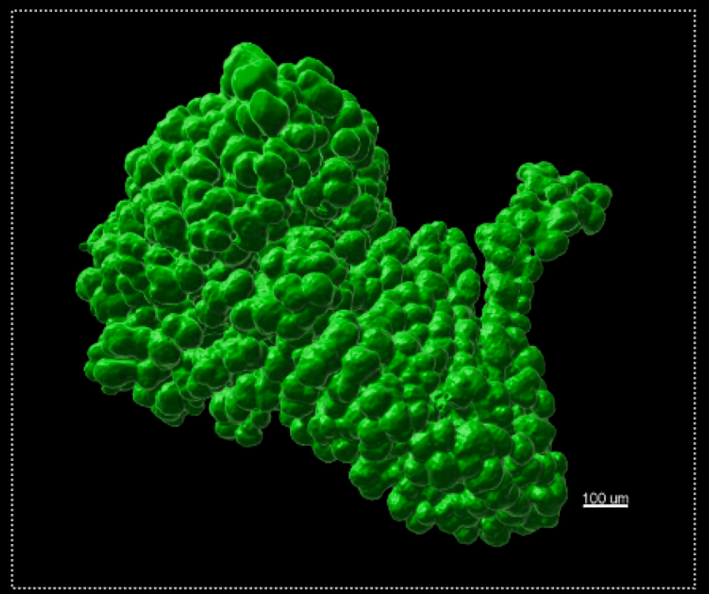
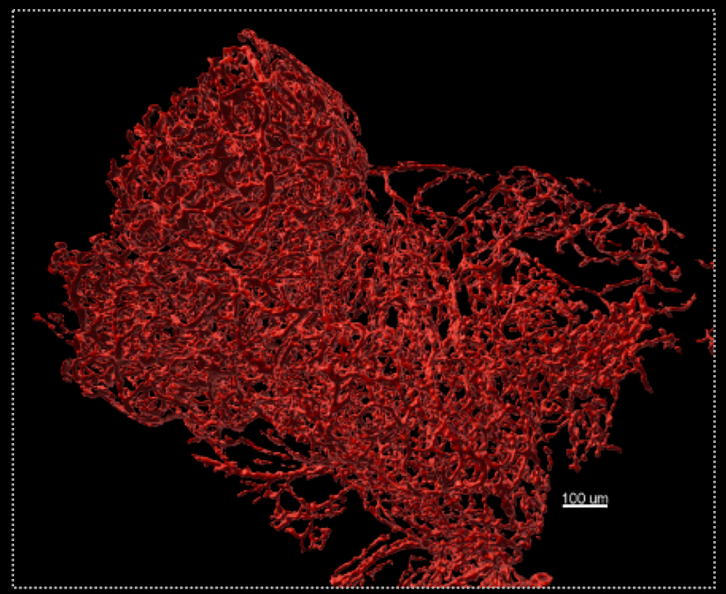
Bioprinting with a developmental logic







Objectives:

1. To build an atlas of 3D architecture of the developing pancreas
2. To develop bioprinting technology for engineering vascularized pancreatic tissue units
3. To establish conditions for in vitro differentiation of the bioprinted pancreatic tissue

https://openbis-pancreas-atlas.ethz.ch/

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ETH zürich
TECHNION Israel Institute of Technology
poietis make tissues real
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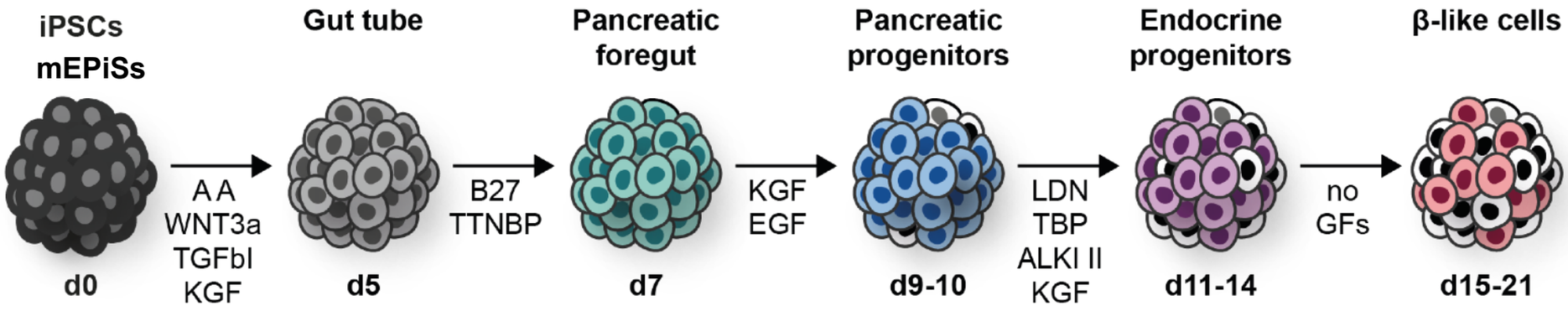
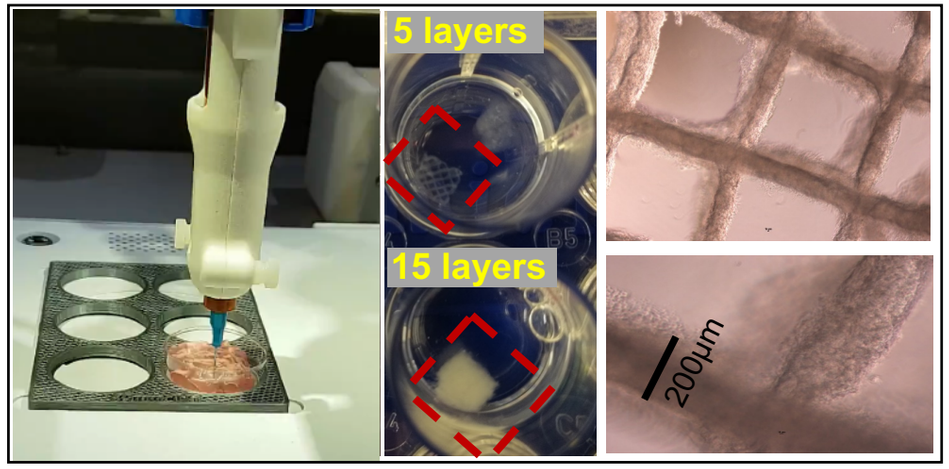
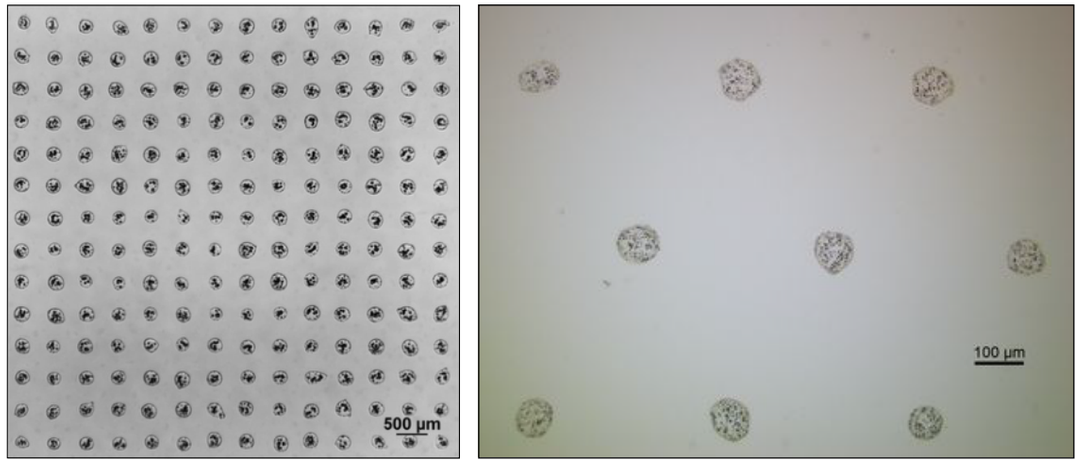
Developing bioprinting processes





Extrusion PP printed in Fibrin + ECM



LAB PP printed droplet in Fibrin + ECM

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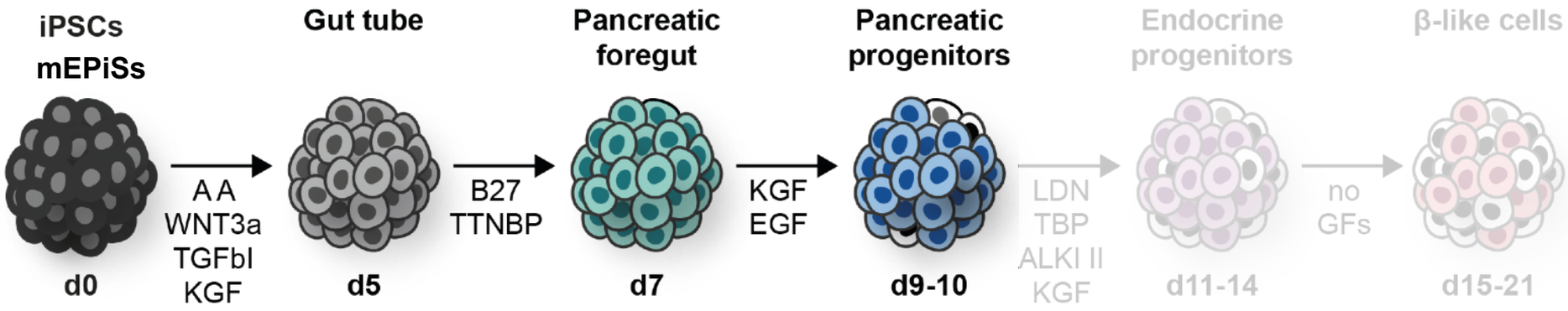
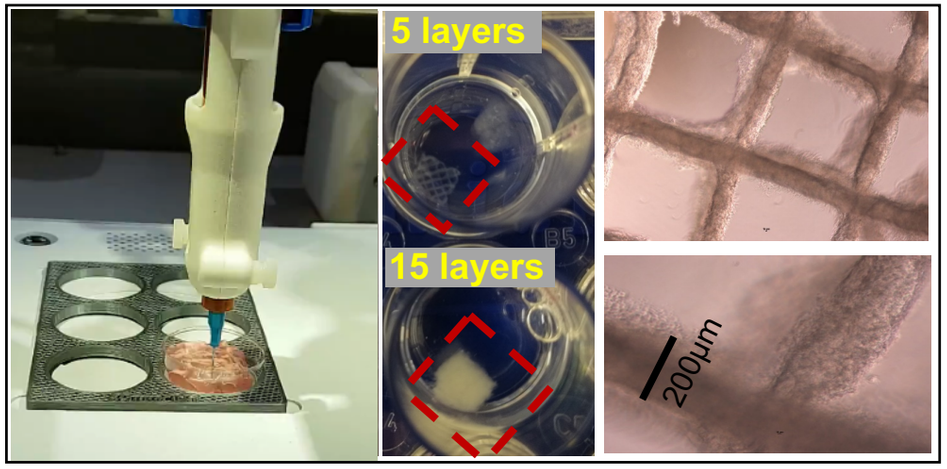
Developing bioprinting processes





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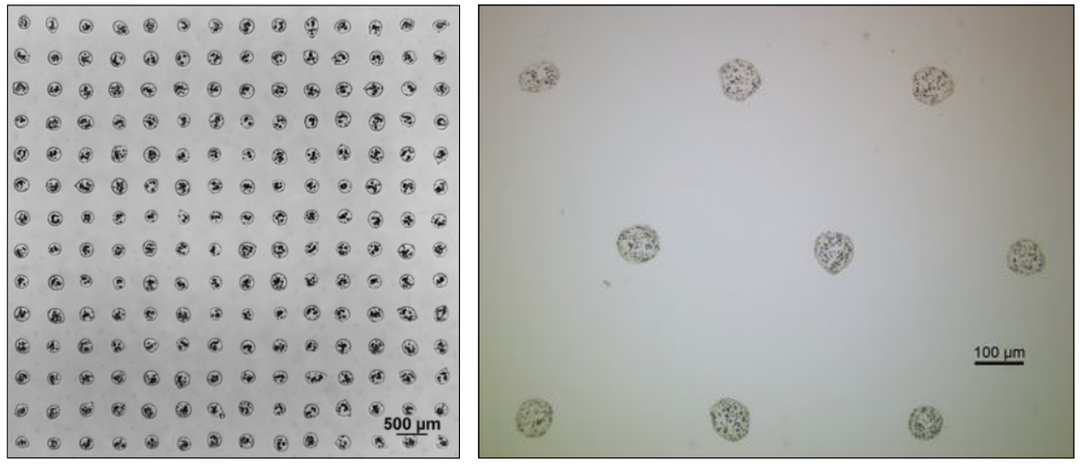

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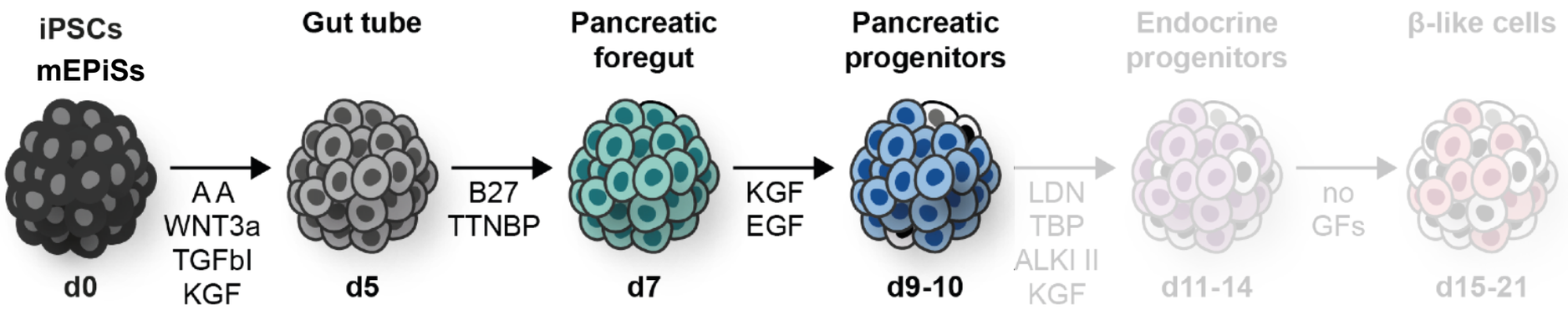
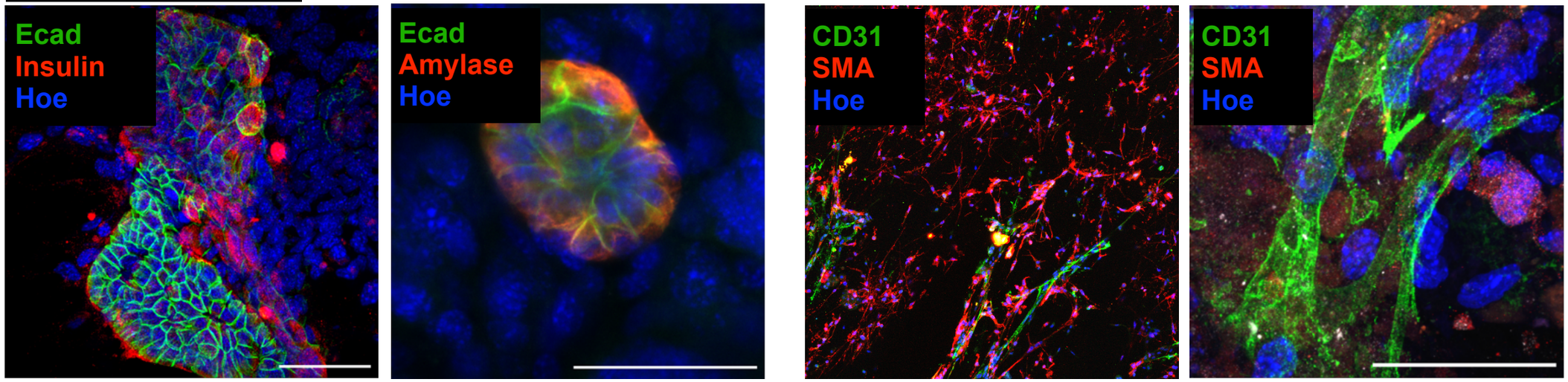


d14 after bioprinting



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Regenerative Medicine

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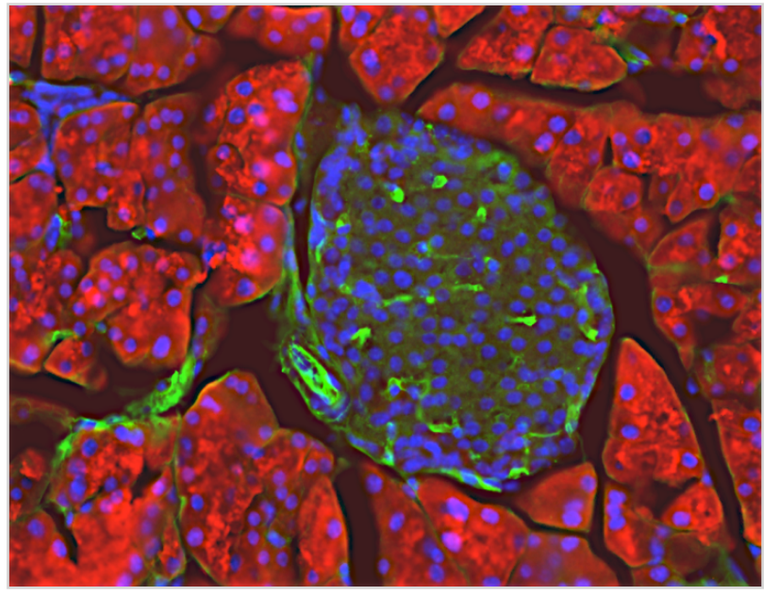
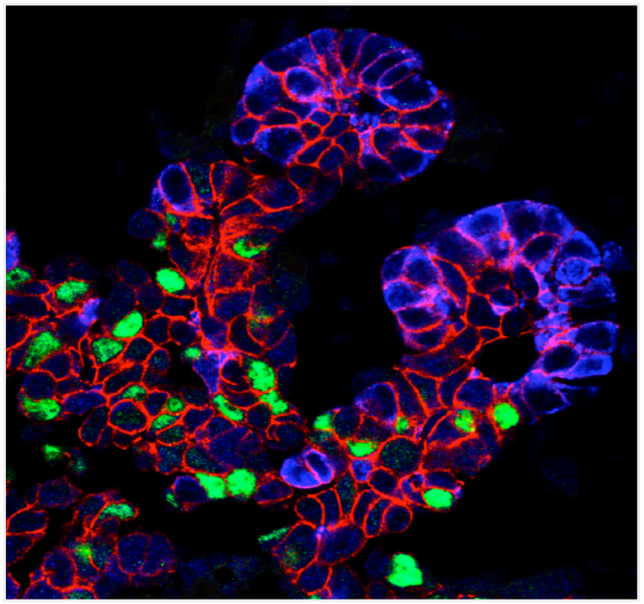


Developmental Processes



The Lab.

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Laura Mueller

Silvia Ruzittu

David Willnow

Heather Wilson

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C. Pierreux, UCL, BE