

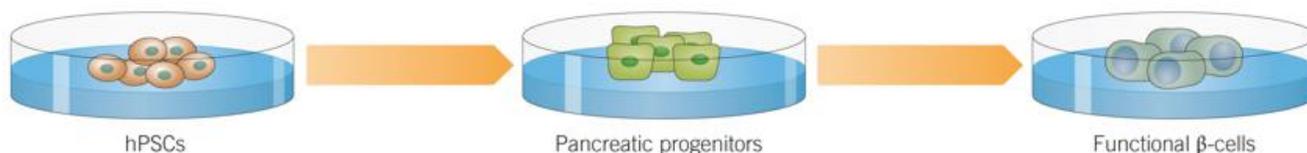
Generation of β cells from hPSCs

This is intended as a guide only; for full experimental details please read the reference provided.

In Brief

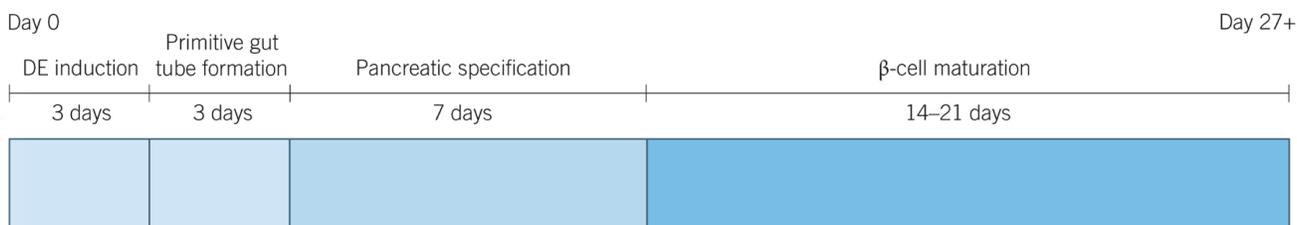
Pagliuca *et al.* describe the generation of insulin-producing pancreatic β cells from human pluripotent stem cells (PSCs) *in vitro* in 4 - 5 weeks using a cocktail of small molecules and proteins.

Briefly, using a suspension-based culture system hESCs and hPSCs were seeded at 6×10^5 cells/ml. After 48 h and 72 h, respectively, differentiation was started by changing the media to Day media. Pancreatic β cells were generated as follows: Days 0-3: Definitive endoderm (DE) induction; Days 4-6; Generation of primitive gut tube (PGT); Days 7-13: Pancreatic specification; Days 14-27+ β cell maturation. The resulting β cells released insulin in response to glucose stimulation *in vitro* and following transplantation into mice.



Cocktails

DE Induction		PGT Generation		Pancreatic Specification		Endoderm Specification		β-cell Differentiation	
Activin A	100 ng/ml	KGF	50 ng/ml	KGF	50 ng/ml	SANT-1 Cat.No. 1974	0.25 μM (Days 14-17 only)	RepSox Cat.No. 3742	10 μM
CHIR 99021 Cat.No. 4423	3 μM	Activin A	100 ng/ml	Retinoic Acid Cat.No. 0695	2 μM	Retinoic Acid Cat.No. 0695	100 nM (25 nM from Day 18)	T3 Cat.No. 6666	3 μM
				SANT-1 Cat.No. 1974	0.25 μM	Compound E Cat.No. 6476	1 μM		
				LDN 193189 Cat.No. 6053	200 nM (Day 7-8 only)	RepSox Cat.No. 3742	10 μM		
				Phorbol 12,13-dibutyrate Cat.No. 4153	10 μM (Day 7-8 only)	T3 Cat.No. 6666	1 μM		
						Betacellulin	20 ng/ml		



Reference

Pagliuca *et al.* (2014) Generation of functional human pancreatic β cells *in vitro*. Cell **159** 428.
PMID: [25303535](#)