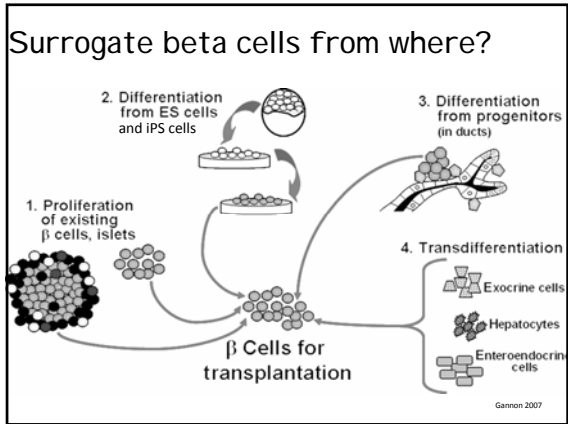


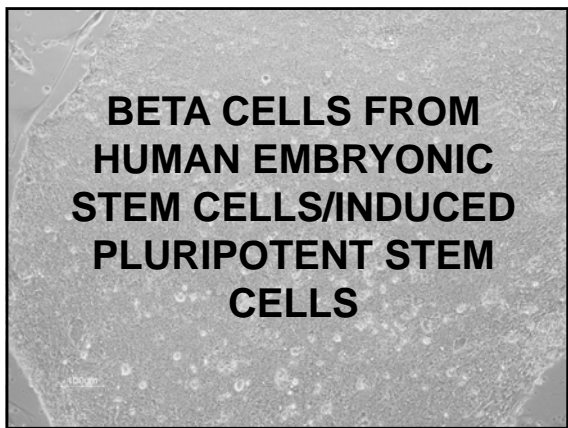
Sources of new beta cells:

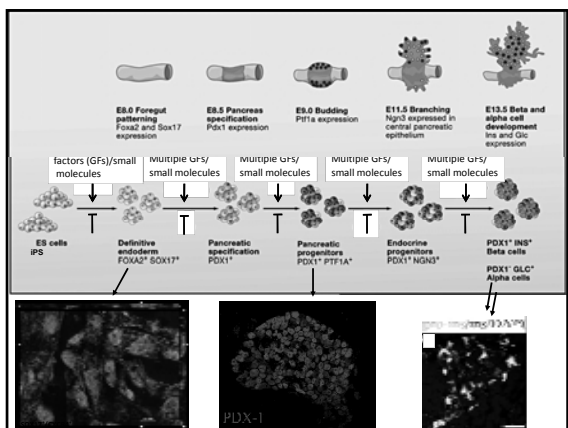
- Beta cells from hESCs/iPS cells
- Regeneration of beta cells
- Transdifferentiation of beta cells

Beta cell developmental biology

Stem cells to model diabetes







Beta cells from hESCs cells

ARTICLES

biotechnology

Pancreatic endoderm derived from human embryonic stem cells generates glucose-responsive insulin-secreting cells *in vivo*

David Korstanj, Laura A. MacInnes, Kamelia Radova, Anne-C. Rang, Christy C. Kelly, Susan Blazan, Wally Young, Miki Eshkolov, Alan C. Kline, Joshua C. Smith, Alan D. Gebede, Kevin S. TF. Adams, Melissa K. Ferguson, Thomas F. Slater

Am J Physiol Endocrinol Metab. 2010 Jun 29.

Inconsistent formation and non function of insulin positive cells from pancreatic endoderm derived from human embryonic stem cells in athymic nude rats.

Matveyenko AV, Georgia S, Bhushan A, Butler PC.

Regeneration of beta cells

ARTICLES

Adult pancreatic β -cells are formed by self-duplication rather than stem-cell differentiation

Yael Dik, Asher Ben-Ner, Roni Khatami, Eyal Ben-Zion, L. Rubin

Cell

β Cells Can Be Generated from Endogenous Progenitors in Injured Adult Mouse Pancreas

Xiobin Xu,^{1,2} John D'Hoier,^{1,2} Guoqiang Wang,^{1,2} Stefan Boonin,^{1,2} Nona De Luca,^{1,2} Xiangqun Xiao,^{1,2} Mark Van De Casteele,^{1,2} George Melnick,^{2,3} Zhibing Ling,^{1,2} Dany Popescu,^{1,2} Luc Bouillon,^{1,2} Raphael Schachner,^{1,4} Gerard Gribble,^{1,5} and Harry Haering^{1,6,7}

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DOI: 10.1016/j.cell.2007.12.016

Transdifferentiation of beta cells

ARTICLES

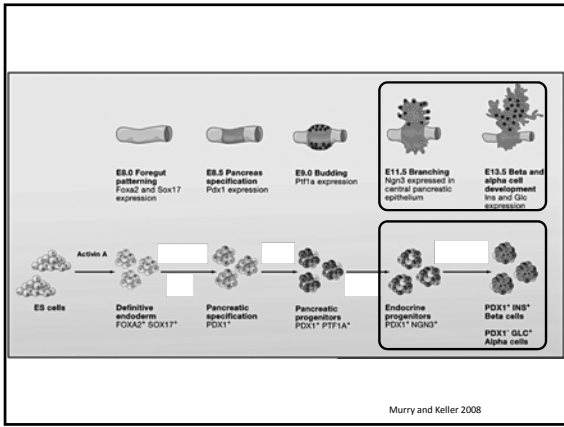
In vivo reprogramming of adult pancreatic exocrine cells to β -cells

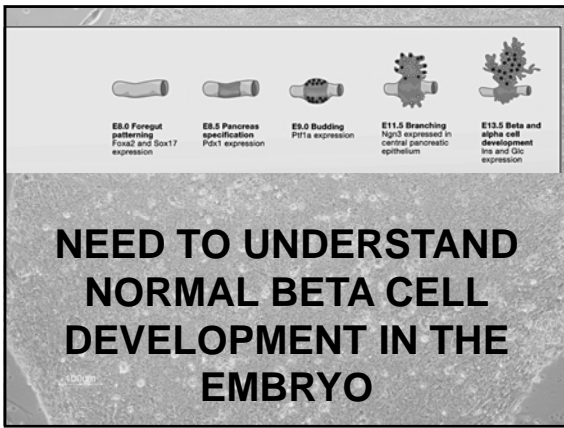
Chao Zhou,¹ Melissa Brown,² Andrew Kovarik,³ Ignacio Rodriguez,⁴ R. Douglas A. Millar⁵

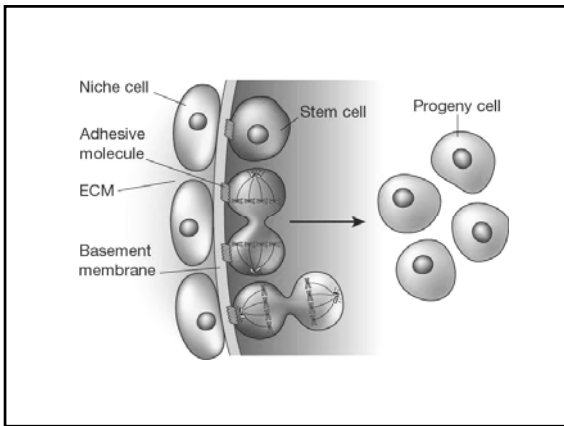
Cell

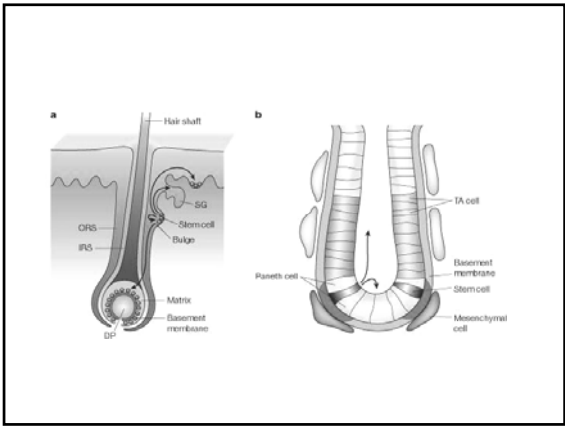
The Ectopic Expression of *Pax4* in the Mouse Pancreas Converts Progenitor Cells into α and Subsequently β Cells

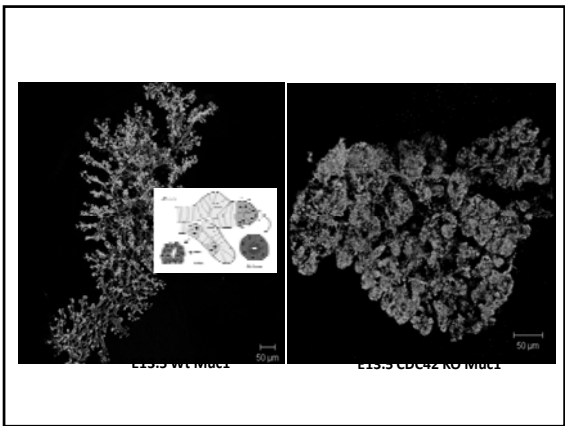
Patrick Colbran,^{1,2,3,4} Yanyan Li,^{1,2,3,4} Melissa Brown,^{1,2,3,4} Andrew Kovarik,^{1,2,3,4} Ignacio Rodriguez,^{1,2,3,4} R. Douglas A. Millar,^{1,2,3,4} and Harry Haering^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100,101,102,103,104,105,106,107,108,109,110,111,112,113,114,115,116,117,118,119,120,121,122,123,124,125,126,127,128,129,130,131,132,133,134,135,136,137,138,139,140,141,142,143,144,145,146,147,148,149,150,151,152,153,154,155,156,157,158,159,160,161,162,163,164,165,166,167,168,169,170,171,172,173,174,175,176,177,178,179,180,181,182,183,184,185,186,187,188,189,190,191,192,193,194,195,196,197,198,199,200,201,202,203,204,205,206,207,208,209,210,211,212,213,214,215,216,217,218,219,220,221,222,223,224,225,226,227,228,229,230,231,232,233,234,235,236,237,238,239,240,241,242,243,244,245,246,247,248,249,250,251,252,253,254,255,256,257,258,259,260,261,262,263,264,265,266,267,268,269,270,271,272,273,274,275,276,277,278,279,280,281,282,283,284,285,286,287,288,289,290,291,292,293,294,295,296,297,298,299,300,301,302,303,304,305,306,307,308,309,310,311,312,313,314,315,316,317,318,319,320,321,322,323,324,325,326,327,328,329,330,331,332,333,334,335,336,337,338,339,340,341,342,343,344,345,346,347,348,349,350,351,352,353,354,355,356,357,358,359,360,361,362,363,364,365,366,367,368,369,370,371,372,373,374,375,376,377,378,379,380,381,382,383,384,385,386,387,388,389,390,391,392,393,394,395,396,397,398,399,400,401,402,403,404,405,406,407,408,409,410,411,412,413,414,415,416,417,418,419,420,421,422,423,424,425,426,427,428,429,430,431,432,433,434,435,436,437,438,439,440,441,442,443,444,445,446,447,448,449,450,451,452,453,454,455,456,457,458,459,460,461,462,463,464,465,466,467,468,469,470,471,472,473,474,475,476,477,478,479,480,481,482,483,484,485,486,487,488,489,490,491,492,493,494,495,496,497,498,499,500,501,502,503,504,505,506,507,508,509,510,511,512,513,514,515,516,517,518,519,520,521,522,523,524,525,526,527,528,529,530,531,532,533,534,535,536,537,538,539,540,541,542,543,544,545,546,547,548,549,550,551,552,553,554,555,556,557,558,559,560,561,562,563,564,565,566,567,568,569,570,571,572,573,574,575,576,577,578,579,580,581,582,583,584,585,586,587,588,589,590,591,592,593,594,595,596,597,598,599,600,601,602,603,604,605,606,607,608,609,610,611,612,613,614,615,616,617,618,619,620,621,622,623,624,625,626,627,628,629,630,631,632,633,634,635,636,637,638,639,640,641,642,643,644,645,646,647,648,649,650,651,652,653,654,655,656,657,658,659,660,661,662,663,664,665,666,667,668,669,670,671,672,673,674,675,676,677,678,679,680,681,682,683,684,685,686,687,688,689,690,691,692,693,694,695,696,697,698,699,700,701,702,703,704,705,706,707,708,709,710,711,712,713,714,715,716,717,718,719,720,721,722,723,724,725,726,727,728,729,730,731,732,733,734,735,736,737,738,739,740,741,742,743,744,745,746,747,748,749,750,751,752,753,754,755,756,757,758,759,760,761,762,763,764,765,766,767,768,769,770,771,772,773,774,775,776,777,778,779,780,781,782,783,784,785,786,787,788,789,790,791,792,793,794,795,796,797,798,799,800,801,802,803,804,805,806,807,808,809,810,811,812,813,814,815,816,817,818,819,820,821,822,823,824,825,826,827,828,829,830,831,832,833,834,835,836,837,838,839,840,841,842,843,844,845,846,847,848,849,850,851,852,853,854,855,856,857,858,859,860,861,862,863,864,865,866,867,868,869,870,871,872,873,874,875,876,877,878,879,880,881,882,883,884,885,886,887,888,889,890,891,892,893,894,895,896,897,898,899,900,901,902,903,904,905,906,907,908,909,910,911,912,913,914,915,916,917,918,919,920,921,922,923,924,925,926,927,928,929,930,931,932,933,934,935,936,937,938,939,940,941,942,943,944,945,946,947,948,949,950,951,952,953,954,955,956,957,958,959,960,961,962,963,964,965,966,967,968,969,970,971,972,973,974,975,976,977,978,979,980,981,982,983,984,985,986,987,988,989,990,991,992,993,994,995,996,997,998,999,1000}









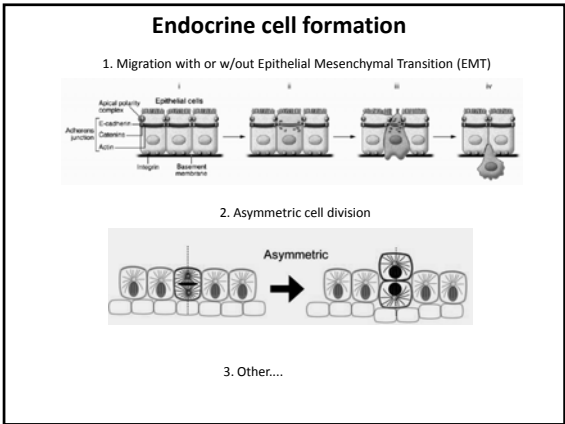


Endocrine cell differentiation/maturation

Delamination & Migration

Questions

1. How do we define delamination?
2. What controls delamination?
3. is delamination required for beta cell differentiation/maturation?



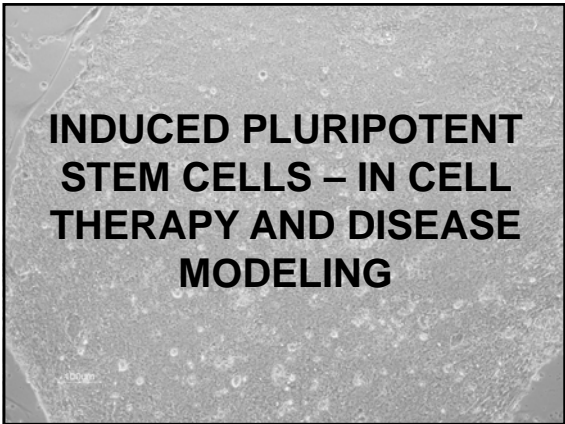
Cell

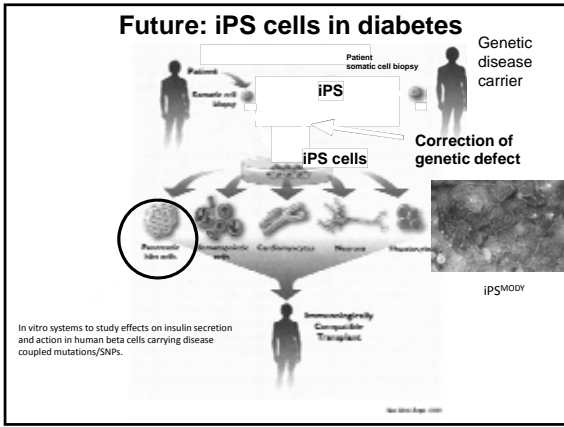
Cdc42-Mediated Tubulogenesis Controls Cell Specification

Gokul Kesavan,¹ Fredrik Wolfgang Sand,¹ Thomas Uwe Gräner,¹ Jenny Kristina Johansson,¹ Sune Kobberup,² Xunwei Wu,² Cord Brakebusch,² and Henrik Semb^{1,*}

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PNAS

Generation of pluripotent stem cells from patients with type 1 diabetes

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Lund Stem Cell Center
Swedish Research Council
