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ORGAN-SPECIFIC BARCODES IN HUMAN FETAL DEVELOPMENT AND STEM CELL DIFFERENTIATION: THE PANCREAS IN THE SPOTLIGHT

1. Whilst lymphatic vessels did not directly intrude the islets of Langerhans, three-dimensional reconstruction revealed that they were present in the vicinity of islets of Langerhans between W17-W22 (this thesis).

2. It was remarkable that the transcriptional expression profile of a set of less than 100 genes was sufficient to identify 21 different human fetal organs/tissues (plus maternal endometrium) and 18 adult human organs (this thesis).

3. Dynamic DNA methylation was associated with enhancers, but not promoters (this thesis).

4. However, hiPSCs derived from fetal brain retained some brain-specific DNA methylation marks that seemed sufficient to confer higher propensity to differentiate to neural derivatives (this thesis).

5. Pancreas organogenesis comprises a coordinated and highly complex interplay of signaling events and transcriptional networks that guide a step-wise process of organ development from early bud specification all the way to the final mature organ state (Pan and Wright, Developmental Dynamics, 2011).
6. The unprecedented number of functional elements identified in this study provides a valuable resource to the scientific community as well as significantly enhances our understanding of the human genome (The ENCODE Project Consortium, Nature, 2012).

7. In this study, we showed that iPS cells can be generated from adult HDF and other somatic cells by retroviral transduction of the same four transcription factors with mouse iPS cells, namely Oct3/4, Sox2, Klf4, and c-Myc (Takahashi et al., Cell, 2007).

8. Our results suggest that the epigenetic memory may predispose BiPSCs to differentiate more readily into insulin-producing cells (Bar-Nur et al., Cell Stem Cell, 2011).

9. What is a scientist after all? It is a curious man looking through a keyhole, the keyhole of nature, trying to know what is going on (Jacques-Yves Cousteau, 1971).

10. Every art should become science, and every science should become art (Friedrich von Schlegel, 1797).

11. Technology gives us power, but it does not and cannot tell us how to use that power (Jonathan Sacks, 2012).

12. All human knowledge takes the form of interpretation (Walter Benjamin, 1923).

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