

Propositions

1. Ground state pluripotency, previously associated with LIF+2i, is only LIF+WNT dependent. (this thesis)
2. WNT signaling does not block the transition to primed pluripotent stem cells, but to rosette-like stem cells. (this thesis)
3. Rosette-like stem cells show several key features of the rosette stage in embryonic development and, illustrated by their transcriptional and epigenetic profiles, are developmentally in between embryonic stem cells and epiblast stem cells. (this thesis)
4. DNA demethylation is not a hallmark of mouse embryonic stem cells but an effect of their culture conditions, particularly MEK inhibition in 2i. (this thesis)
5. Inhibition of endogenous WNT signals generates homogenous cultures of undifferentiated mouse epiblast stem cells and undifferentiated human embryonic stem cells, a prerequisite for preclinical studies with human pluripotent cells. (this thesis)
6. A third pluripotency state exists as part of a developmental continuum between the naïve and primed phases. (A. Smith, 2017. Formative pluripotency: the executive phase in a developmental continuum. *Development*, 144: 365-373)
7. Modified culture conditions can induce novel characteristics in embryonic stem cells or epiblast stem cells confirming that the functional definition of pluripotency can be fulfilled while encompassing a broad spectrum of additional properties. (S. Morgani, J. Nichols and A.K. Hadjantonakis, 2017. The many faces of Pluripotency: in vitro adaptations of a continuum of in vivo states. *BMC Developmental Biology*, 17: 7)
8. Embryonic stem cells are able to undertake morphogenetic events *in vitro* that closely mimic the epiblast transition from a ball of cells to a polarized epithelium both temporally and mechanistically. (I. Bedzhov and M. Zernicka-Goetz, 2014. Self-Organizing Properties of Mouse Pluripotent Cells Initiate Morphogenesis upon Implantation. *Cell*, 156(5): 1032-1044)
9. The pluripotency gene regulatory network integrates external signals, and exerts control over the decision between self-renewal and differentiation at the transcriptional, post-transcriptional and epigenetic levels. (M. Li and C.I. Belmonte, 2017. Ground rules of the pluripotency gene regulatory network. *Nature Reviews Genetics*, 18: 180-191).
10. Understanding the heterogeneity of pluripotent stem cells is an important part of understanding normal embryonic development and is essential for the future application of pluripotent stem cells in translational medical research. (J. Wu, T. Yamauchi and C.I. Belmonte, 2016. An overview of mammalian pluripotency. *Development*, 143: 1644-1648).
11. "At the end of a storm there's a golden sky..." (Gerry and the Pacemakers)