

Propositions accompanying the doctoral dissertation

Gata2 in Hematopoietic Cell Generation

1. *Gata2Venus* reporter expression discriminates cells of different hematopoietic potentials that emerge during embryonic stem cell differentiation. (this thesis)
2. Progressive stages of *Gata2Venus* embryonic stem cell hematopoietic differentiation are highly analogous to the *in vivo* waves of hematopoietic cell generation. (this thesis)
3. *Gpr56* is a positive regulator of hematopoietic progenitor cell development. (this thesis)
4. *Gpr97* provides compensatory expression and function when *Gpr56* is not present. (this thesis)
5. *Gata2Venus* reporter marks all mast cell potential in pluripotent stem cell differentiation cultures, and offers a rapid and robust approach for the generation of functional mast cells. (this thesis)
6. 'Substantial clonal expansion of hematopoietic stem cells *in vitro*, unquestionably requires more than just a cytokine cocktail, and instead requires a three-dimensional reconstruction of the niche, including the appropriate cells and extracellular matrix, to allow the generation of a stable 'stem-cell–niche synapse'.' (Wilson, A. & Trumpp, A. *Nature Immunology*, 2006). This is likely true for the *de novo* generation of hematopoietic stem cells.
7. 'Given that hematopoietic stem cell transplantation, and the transfusion of terminally differentiated blood cells, are effective therapies for the treatment of haematological disorders, the generation of these cell types from pluripotent stem cells would overcome the current shortage of compatible donors and expand the patient groups that can be treated with cell based therapies.' (Ditadi, A., Sturgeon, C., Keller, G. *Nature*, 2017)
8. 'An impending challenge in the hematopoietic stem cell field is the extent of biological heterogeneity that requires molecular elucidation at the single-cell level.' (Eaves, C.J. *Blood*, 2015)
9. 'An event that comes as a surprise, has a major effect, and is often inappropriately rationalized after the fact with the benefit of hindsight.' The Black Swan Theory. (Taleb, N. N. *The Black Swan: The impact of the highly improbable*)
10. 'It ain't what you know that gets you into trouble. It's what you know for sure that just ain't so.' (Josh Billings, Mark Twain)
11. 'Simplicity is the keynote of all true elegance.' (Coco Chanel)

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