Propositions accompanying the thesis

Hematopoietic Progenitor and Stem Cell Regulation during Development: Hypoxia and Niches

1. The human placenta is replete with potent hematopoietic stem cells (HSCs) that can be considered, in addition to umbilical cord blood cells, as a source of HSCs for banking and potential clinical use (*this thesis; Cell Stem Cell 5, 385-395, 2009*).

2. HIF1α is one of the regulators of hematopoietic progenitor and stem cell (HPSC) development and function in embryonic hematopoietic tissues beginning from the hemogenic endothelial stage onward (*this thesis*).

3. HIF1α is essential for endothelial-to-hematopoietic transition and/or growth/expansion of the emerging hematopoietic progenitor and stem cells (*this thesis*).

4. HIF1α plays a role in regulating bone marrow HSC function under stress conditions (*this thesis*).

5. If their roles are completely clarified, Hypoxia and HIF1α can be major factors for improving the *in vitro* growth and manipulation of HSCs for clinical transplantation strategies.

6. The balance between the quiescent and proliferative states of HSCs is tightly regulated by the surrounding niche (*Coskun and Hirschi, Birth Defects Research Part C, Embryo Today: Reviews 90, 229-242, 2010; Arai and Suda, StemBook, 2008*).

7. The hematopoietic stem cell niche: low in oxygen but a nice place to be (*Eliasson and Johnsson, Journal of Cellular Physiology 222: 17–22, 2010*).

8. Hypoxia and HIFs are responsible for many aspects of embryonic development and placenta morphogenesis (*Dunwoodie, Developmental Cell 17, 755-773, 2009*).

9. The metabolic properties of HSCs support their adaptation and survival in hypoxic niche (*Simsek et al., Cell Stem Cell 7, 380-390, 2010*).

10. We are only beginning to understand the role of hypoxia and its signaling pathways in stem cell functions. Considerable effort needs to be invested in addressing important questions surrounding stem cell niches and the impact of their hypoxic microenvironment on HSC fate decisions in vivo (*Pollard and Kranc, Cell Stem Cell 7, 276-278, 2010*).

11. Writing propositions after writing a whole thesis is a nice touch!