STRONG CHILDREN'S RESEARCH CENTER

Summer 2012 Research Scholar

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ABSTRACT

Title: **Different Lineages of Erythropoiesis Arise from Human Embryonic Stem Cells**

Background: Three distinct but overlapping lineages of red blood cells arise during mammalian development (Figure 1). The first two lineages: primitive and erythro-myeloid (EMP) definitive erythropoiesis, emerge in the yolk sac of the murine embryo and also in murine embryonic stem cells (mESC). The Palis lab has found embryonic and mESC derived EMP to be a source of extensively self-renewing erythroblasts (ESRE).

Objective: The goal of this project is to determine if similar overlapping lineages of erythropoiesis also emerge in human development.

Results: Cell morphology, globin gene expression, and glucocorticoid receptor expression were analyzed in differentiated human embryonic stem cell (hESC) cultures in order to classify cell types generated at different developmental time points. Colonies derived from early erythroid progenitors express predominantly embryonic globins, while colonies derived from later progenitors express predominantly fetal globins as well as glucocorticoid receptor.

Results: These data suggest that primitive and erythro-myeloid definitive erythroid lineages also arise during human development and offer the hope that self-renewing erythroblasts can be generated in vitro to serve as a new source of red blood cells for transfusion therapy.