During mouse embryonic development, hematopoiesis has been well studied. At the stage of our sample (E11.5), embryonic erythrocytes can be found in circulation system and are undergoing differentiation to mature erythrocytes [1][2]. It has been proposed that beginning at E11.5, first definitive erythrocytes were produced [3]. In our t-SNE projection, blood-related signals were detected from several clusters in our GSEA. One of the three clouds presents ‘erythrocytes’ signals (**FIGXXX**). By analyzing its sub clusters at IBS i5 resolution, all sub clusters show comparable results. Interestingly, this cloud shows a crescent like structure, which may indicate a transition of differentiating erythrocytes along its axis. To test this hypothesis, we first projected several hemoglobin genes onto this structure (**FIGXXX**). Adult β-globin (*Hbb-βS* and *Hbb- βT*) shows an opposite gradient trend as embryonic β-globin (*Hbb-Y and Hbb-h1*), while the same as adult α-globin (*Hba-a1*). The gradient of these genes expression indicates a switch between unmatured and mature erythrocytes, which has been reported before [2][4]. One the other end, we re-computed PCs for this cloud to see genes driving this crescent like structure **(FIGXXX**). By running GSEA for top genes contributing to negative and positive PC1, we found that cells from one end of the cloud show a stronger signal of house-keeping biological processes like ‘mitotic division’ and ‘translation’, which matches cells undergoing enucleation. We also found clusters with blood-related signals which can be potential cell types differentiated from hematopoietic stem cells, such as monocytes (**FIGXXX**), megakaryocytes (**FIGXXX**). Marker gene projections were made to support GSEA results (**FIGXXX**).

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