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Hair follicles develop in embryonic skin giving rise to important components such as the adult follicle stem cells and the dermal papilla (DP), which acts as an instructive niche. The stem cells come from epidermal placodes, whereas the DP originates from dermal condensates (DCs) of mesenchymal origin. In the dermis, fibroblast sorting into upper and lower compartments is crucial for hair follicle morphogenesis, as upper papillary fibroblasts are competent for DC formation. The signals that regulate fibroblast migration to produce the distinct dermal layers and induce DC fate and clustering remain unknown. Preliminary transcriptome data throughout hair follicle development implicate the Slit-Robo and Netrin-Dcc axon guidance pathways in fibroblast sorting and migration for DC emergence. My project will test the hypothesis that Slit-Robo and Netrin-Dcc signaling regulate fibroblast migration for DC formation, increasing our understanding of de novo hair follicle formation for future regenerative treatments.