

**Title:** Neural Migration, Differentiation, and Stress Response Captured with Single-Cell RNA-Seq

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**Abstract:** Neural stem cells often migrate from a stem cell niche to the site of innervation, typically accompanied by differentiation. We have investigated this phenomenon using single-cell RNA-seq in two distinct model systems. In zebrafish embryos, we generated a site-specific *phox2bb* knock-in line to isolate rare cells from the developing enteric nervous system. We observed stem-like and neural-like cell populations and used pseudotime analysis to reveal the progression of gene expression along these trajectories. In a Cnidarian model system, *Clytia hemisphaerica* medusa (jellyfish) were dissociated and labeled with animal-specific DNA oligonucleotides or ClickTags. After subjecting the samples to single-cell RNA-sequencing, we uncovered a cell atlas for *Clytia* gene expression under starved and fed conditions. We characterize the process of cnidocyte (stinging cell) differentiation and speculate on the origin of a starvation-specific neuronal cell type.