

# Stem Cell Differentiation in Hydra at Single Cell Resolution

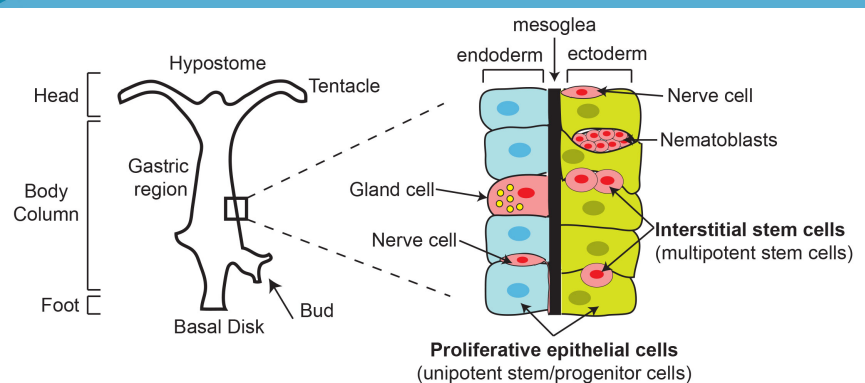
## About Dr. Celina Juliano

Dr. Juliano is currently a professor at the UC Davis Department of Molecular & Cell Biology.

Her research investigates molecular mechanisms that underlie stem cell function which achieves a better understanding of regenerative biology and the aging process. To study this her lab uses the Hydra, a simple aquatic animal, which undergoes continual self-renewal, lacks senescence, and has robust regenerative capabilities.



## Hydra



**Figure 1 - Hydra body plan and stem cell populations.** *Hydra* propagates by both asexual budding (arrow) and sexual reproduction (not shown). *Hydra* is composed of three distinct lineages: Ectodermal epithelial (green), Endodermal epithelial (blue) and the Interstitial lineage (pink). The two epithelial lineages form the outside and inside of the body column as two single cell layers separated by the mesoglea, an extracellular matrix. The epithelial cells along the entire length of the body column are **unipotent stem/progenitor cells** that act both as an epithelium and as the source of terminally differentiated cell types found at the extremities (tentacle and basal disk cells). The interstitial lineage is supported by **multipotent stem cells** (I-cells) found in the interstices between the ectodermal epithelial cells of the body column. The I-cells give rise to the nerve cells, gland cells, nematocysts, and germ cells (not shown).

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