Postdoc position available: Role of cell types in development of *Hydra vulgaris*

We are recruiting candidates for a joint postdoctoral position to investigate neuronal cell types in the development of the nervous system of the cnidarian *Hydra vulgaris*. To understand the development of a nervous system, a dream experiment would be to watch how a collection of single, isolated neurons put themselves together to form a functional nervous system, monitoring the activity of every neuron and muscle cell as this happens. This experiment is possible in *Hydra*. This small, transparent polyp can completely self-assemble after its body has been dissociated into a puree of individual cells. This remarkable process is complete within a few days and occurs robustly in culture dishes under a microscope (https://www.youtube.com/watch?v=1DGIIEISQMA)(1). Hydra has a simple nervous system, composed of a few hundred neurons, belonging to a dozen identified cell types (2). In *Hydra* one can also image the activity of every neuron (3) and every muscle cell (4), and also use machine learning algorithms to describe its behavior systematically (5). Moreover, one can image all neuronal activity during reaggregation of the animal, as circuits become synchronized (6).

The project, a collaboration between the Hobert and Yuste laboratories at Columbia University, will focus on identifying and mapping the cell types in Hydra during reaggregation, harnessing both molecular and optical imaging approaches. We will investigate molecular and cellular mechanisms by which its different cell types neurons self-sort and self-organize into functional circuits. One particularly goal would be to establish and further develop transgene and/or CRISPR/Cas9 technology to generate fluorescently labeled hydra animals to allow for live imaging of nervous system development (akin to efforts described here: https://pubmed.ncbi.nlm.nih.gov/33378642/). Our team is a collaborative and creative group of scientists with diverse backgrounds and interests, but united by our drive to understand the role of cell types in neural circuits. Our expertise spans from biophysics, genetics, molecular and cell biology, neuroscience, engineering, optics, chemistry and computational theory. Candidates should have PhD training in the biology of basal metazoans or genetically tractable model systems. To apply please email the following to both Oliver Hobert (or38@columbia.edu) and Rafael Yuste (rmy5@columbia.edu).

1- Cover letter that describes your past research experience and motivation for applying
2- Pdfs of most relevant published papers or pre-prints
3- Names and contact information for 3 or more potential references

References:

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