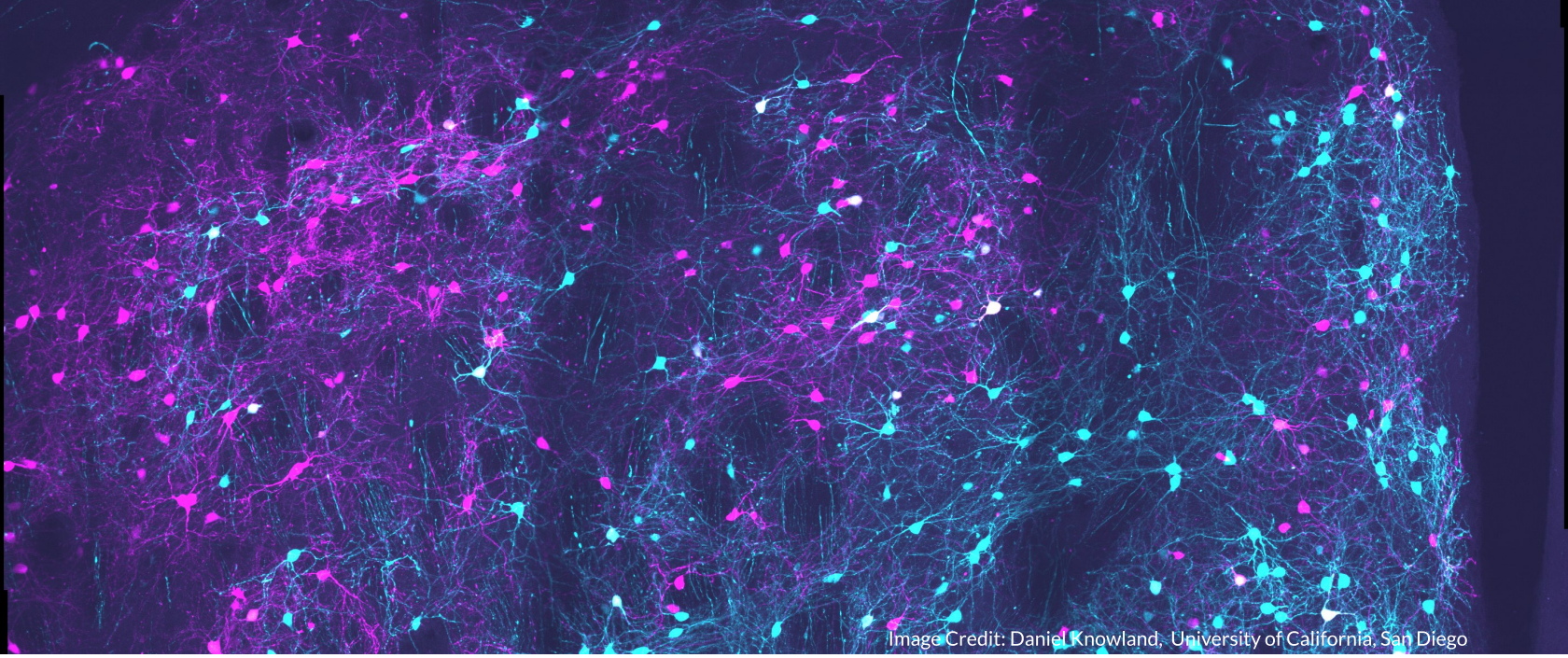

Image Credit: Daniel Knowland, University of California, San Diego

SUPER RESOLUTION

The nervous system is simultaneously the most highly-organized and diversely populated organ system we have, and neurons must assume a wide range of both highly specific and divergent roles. Subtle changes at the molecular level attune these neurons to their surroundings, their information flow, and their history.

So far, we've journeyed through most of the brain's strata, moving through the furrows of the cortex, along projections down to the limbic subnuclei, and into their underlying microcircuits. However, these are all composed of even more intricate architectures: the spectacular elements within the neurons themselves.

Take a look at a synapse on an earlier page: it is not only a contact between those two neurons, but it holds an array of vesicles zipping into a membrane in concert, opposite a finely-tuned balance of receptors bound to a dense lattice right below the surface. Such organization is not exclusive to the synapse, but instead supports every structure in the nervous system.

Just as all these higher, complex structures are composed of lower, simple structures, the mind's emergent phenomena arise out of molecular phenomena. After all, appreciating art and learning to talk are simply, at the most basic level, very specific ways that salt moves through pores in our neurons.

If we want to fully comprehend why some songs remind us of past summers, or why a child's first word was 'cat,' we must understand the molecular basis behind these experiences. If we want to fully comprehend why some babies are born unable to hear, or why some autistic children will never learn to speak, we must know the molecular basis behind these disorders. For these reasons (among many more), the relevance of subcellular processes can hardly be overstated.

Join us in this section as we descend deeper, into the neuron. Here, we can watch neural stem cells differentiate into mature neurons, growth factors making their dendritic arbors sprout and bloom. In more mature cells, we can see webs of actin crisscrossing the cytoplasm or leading creeping growth cones as they traverse. All of the following images underscore the intrinsic beauty of some of the finest structures within our nervous system.

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