



## Life Sciences Seminar

# Evolution of Telencephalon Spatial Structures and Cell types

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Technion

Host: Lora Sweeney

Teleost fish form the largest group of vertebrates, making them critically important for the study on the mechanisms of brain evolution. In fact, teleosts show a tremendous variety of adaptive behaviors similar to birds and mammals, however, the neural basis mediating these behaviors remains elusive. We performed a systematic comparative survey of the goldfish telencephalon; the seat of plastic behavior, learning and memory in vertebrates. We delineated and mapped goldfish telencephalon cell types using single-cell RNA-seq and spatial transcriptomics, resulting in de novo molecular neuroanatomy parcellation. Glial cells were highly conserved across 450 million years of evolution separating mouse and goldfish, while neurons showed diversity and modularity in gene expression. Specifically, somatostatin (SST) interneurons, famously interspersed in the mammalian isocortex for local inhibitory input, were curiously aggregated in a single goldfish telencephalon nucleus, but molecularly conserved. Cerebral nuclei including the striatum, a hub for motivated behavior in amniotes, had molecularly and spatially conserved goldfish homologues. We further suggest different elements of a hippocampal formation across the goldfish pallium. Together, our atlas provides new insights to organization and evolution of vertebrate forebrains and may serve as a resource for the functional study underlying cognition in teleost fish.

**Monday, August 28, 2023 03:00pm - 04:00pm**

Central Building Mond 2



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