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RETROGRADE-AAV PLATFORM THAT ENABLES MULTIPLEX PROJECTION TRACING AND MULTI-MODAL PROFILING OF PROJECTION NEURONS

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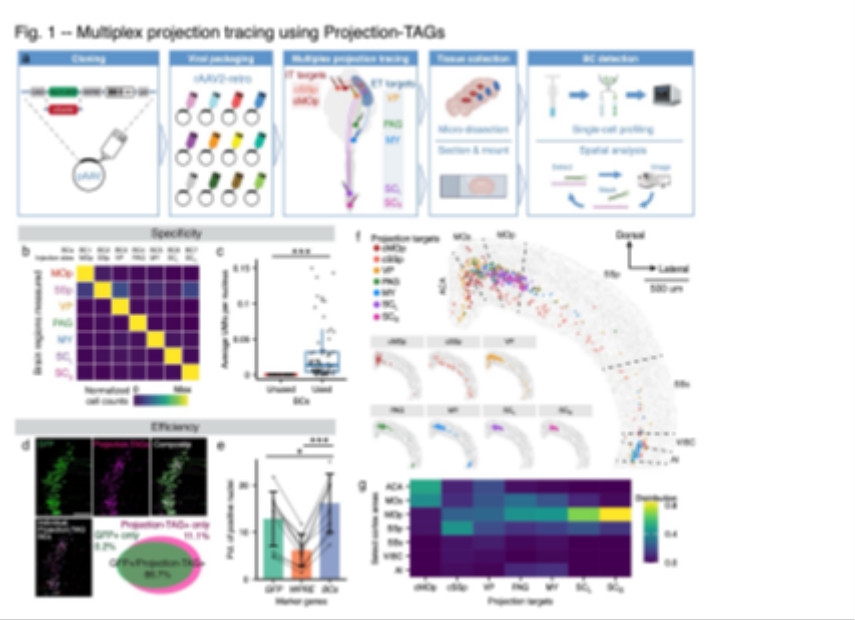
Value proposition: *Powerful, high throughput platform that allows for the multiplex tracing of projection neurons to obtain a snapshot of activity-dependent recruitment of distinct projection neurons and their molecular features.*

Technology Description

Researchers at Washington University in St. Louis have developed Projection- TAGS, a retrograde AAV platform that allows multiplex tracing of projection neurons by tagging each neuronal projection with a unique RNA barcode. Investigating the spatial organization, transcriptional and epigenetic landscapes of brain wide projection neurons is hampered by the lack of efficient and easily adoptable tools.

This platform can perform systemic multiomics analyses to gain insight into the spatial location, gene expression, and chromatin accessibility profiles of diverse projection neurons, and can be leveraged to build a comprehensive multi-modal map of brain neuronal cell types and their projections.



Above figure: Multiplex projection tracing using Projection-TAGs

Stage of Research

Performed multiplex projection tracing of the mouse cortex and high-throughput single-cell profiling of the transcriptional and epigenetic landscapes of the cortical projection neurons. Additionally, screened 50 barcodes that can be packaged to increase multiplexing of projection tagging.

Publications

- Yang L, Liu F, Hahm H, Okuda T… MR, Samineni VK. Projection-TAGs enable multiplex projection tracing and multi-modal profiling of projection neurons. bioRxiv [Preprint]. 2024 Apr 28:2024.04.24.590975.

Applications

- Projection tracing and multi-modal profiling of projection neurons

Key Advantages

- Powerful, high-throughput platform for multi-modal profiling
- Significantly less expensive to perform than alternative methods of neuronal tracing
- Set of engineered retrograde AAVs each express a unique barcode
- Flexible and extremely compatible with various sequencing tools/instruments

Patents

Patent application filed

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