

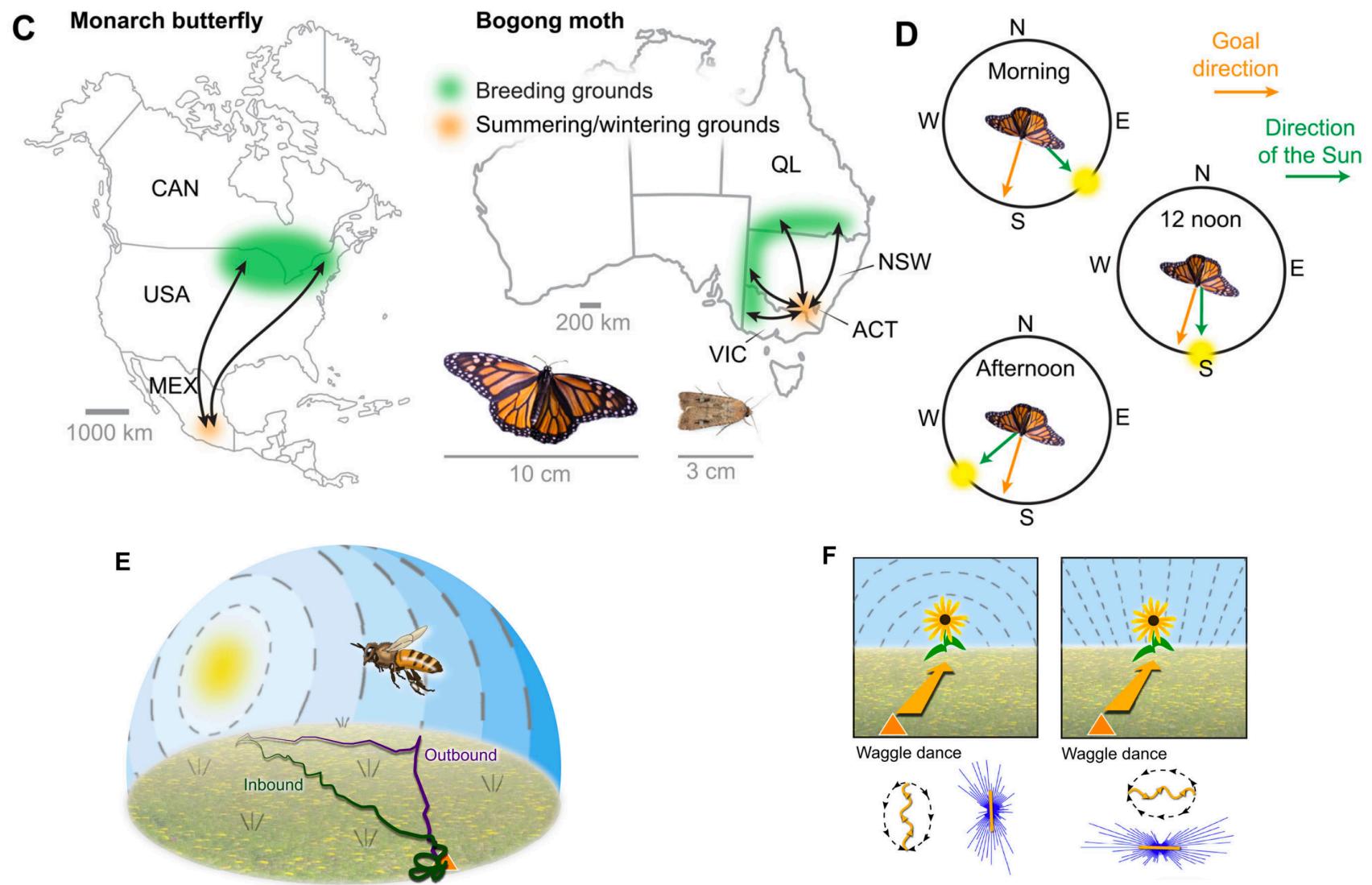
Connectome based theory in Drosophila

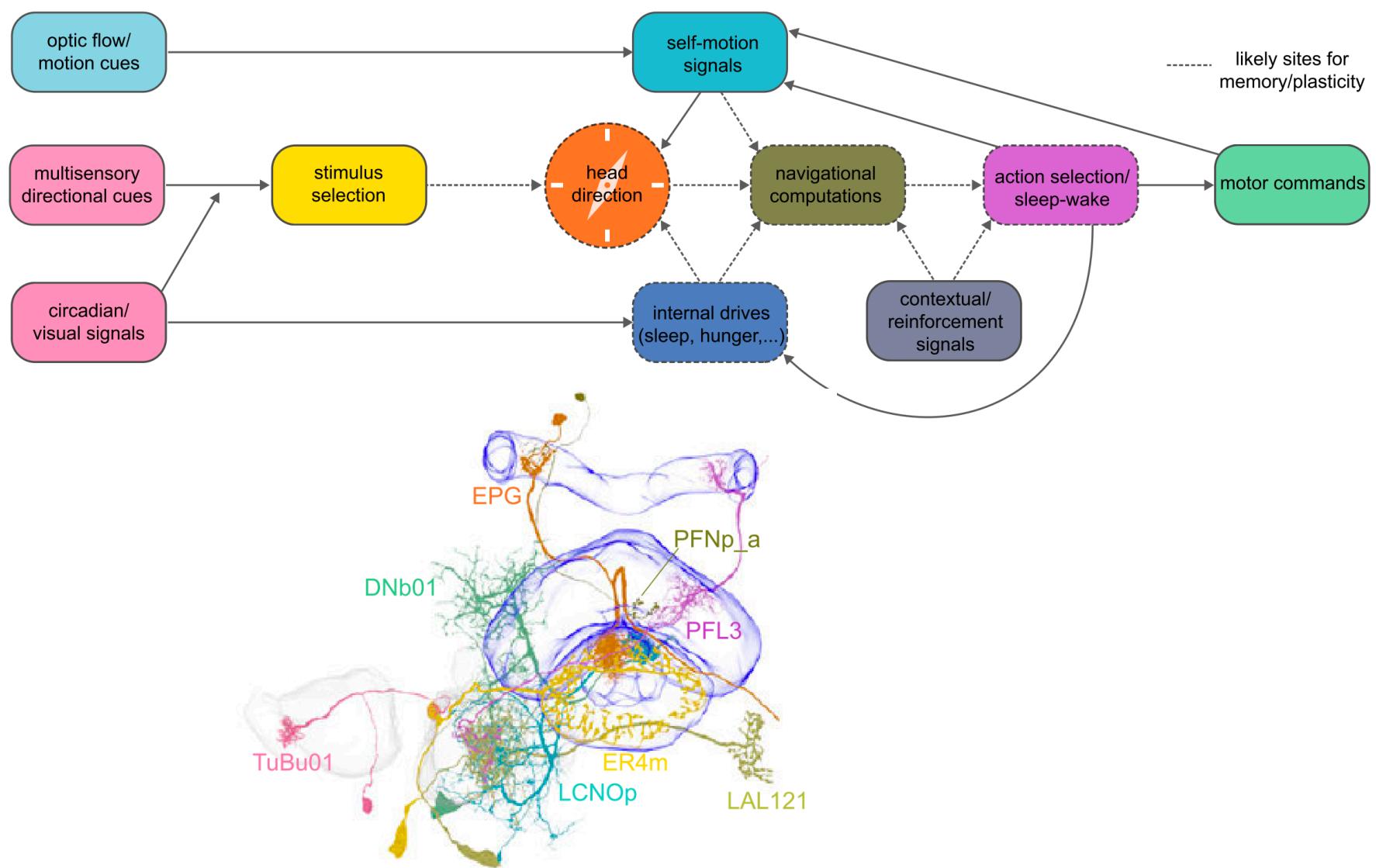
Brabeeba Wang

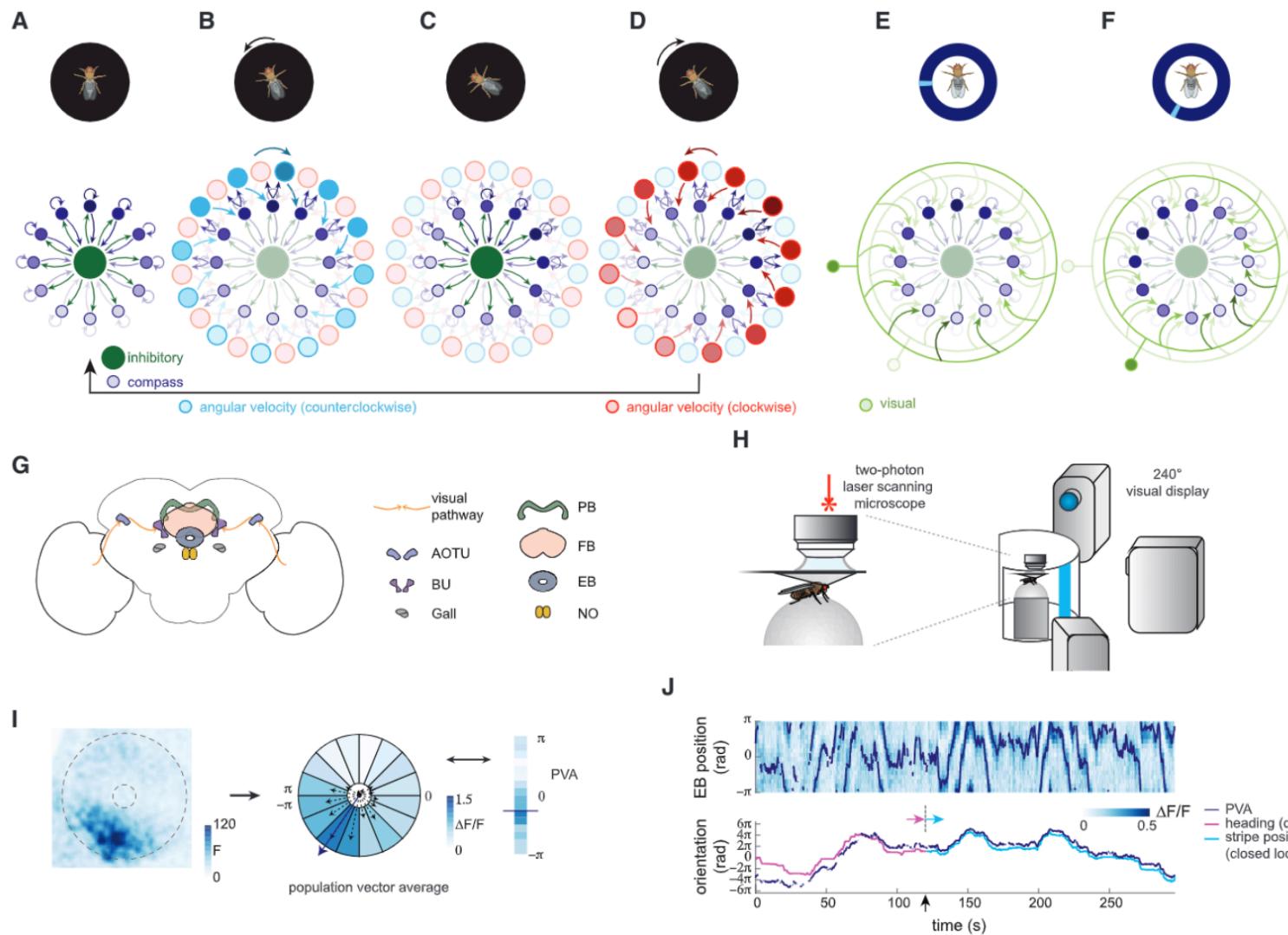
05/02/2023

How does connectome inspire theory?

- Behaviors (computational goal)
- Connectome (biological prior)
- Functional electrophysiology (neural representation)
- => Theory

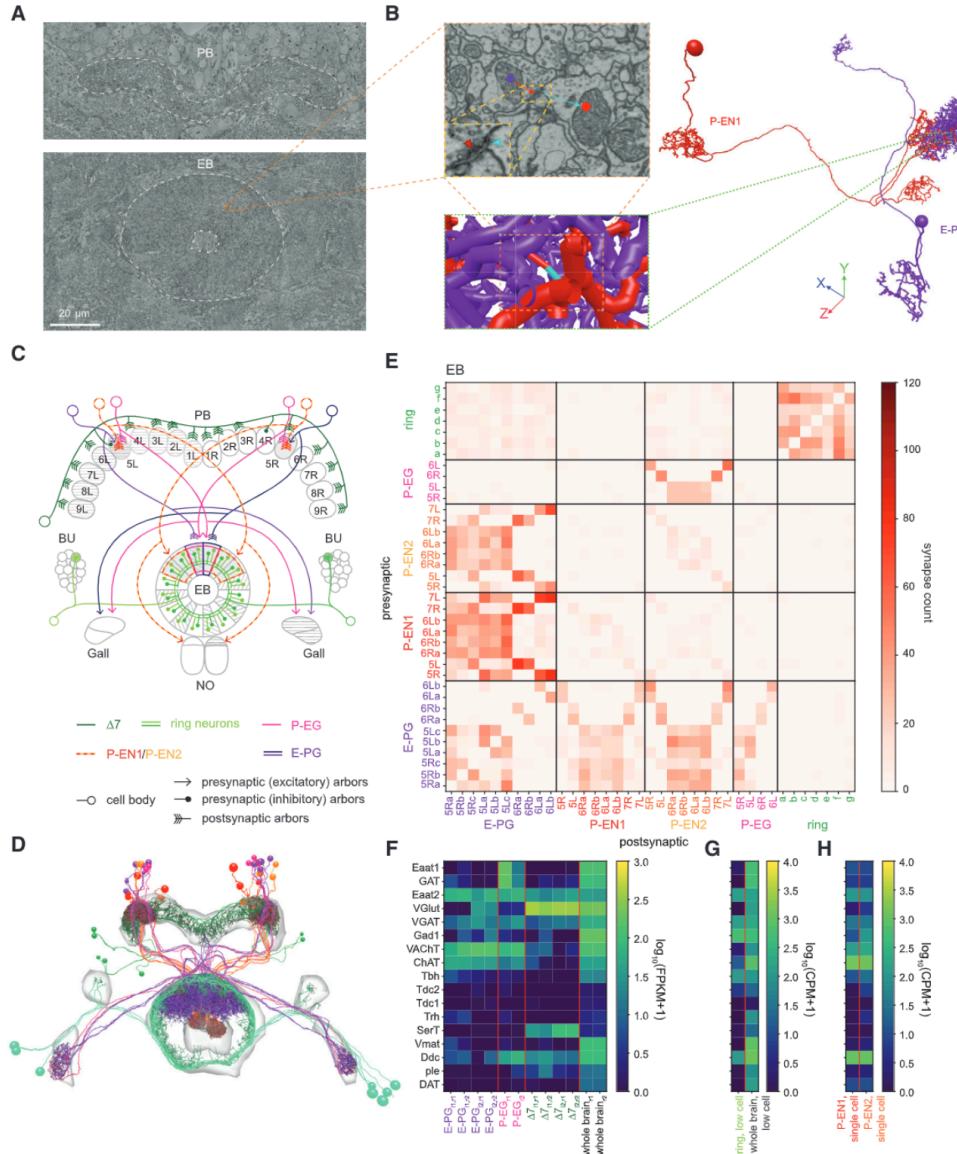


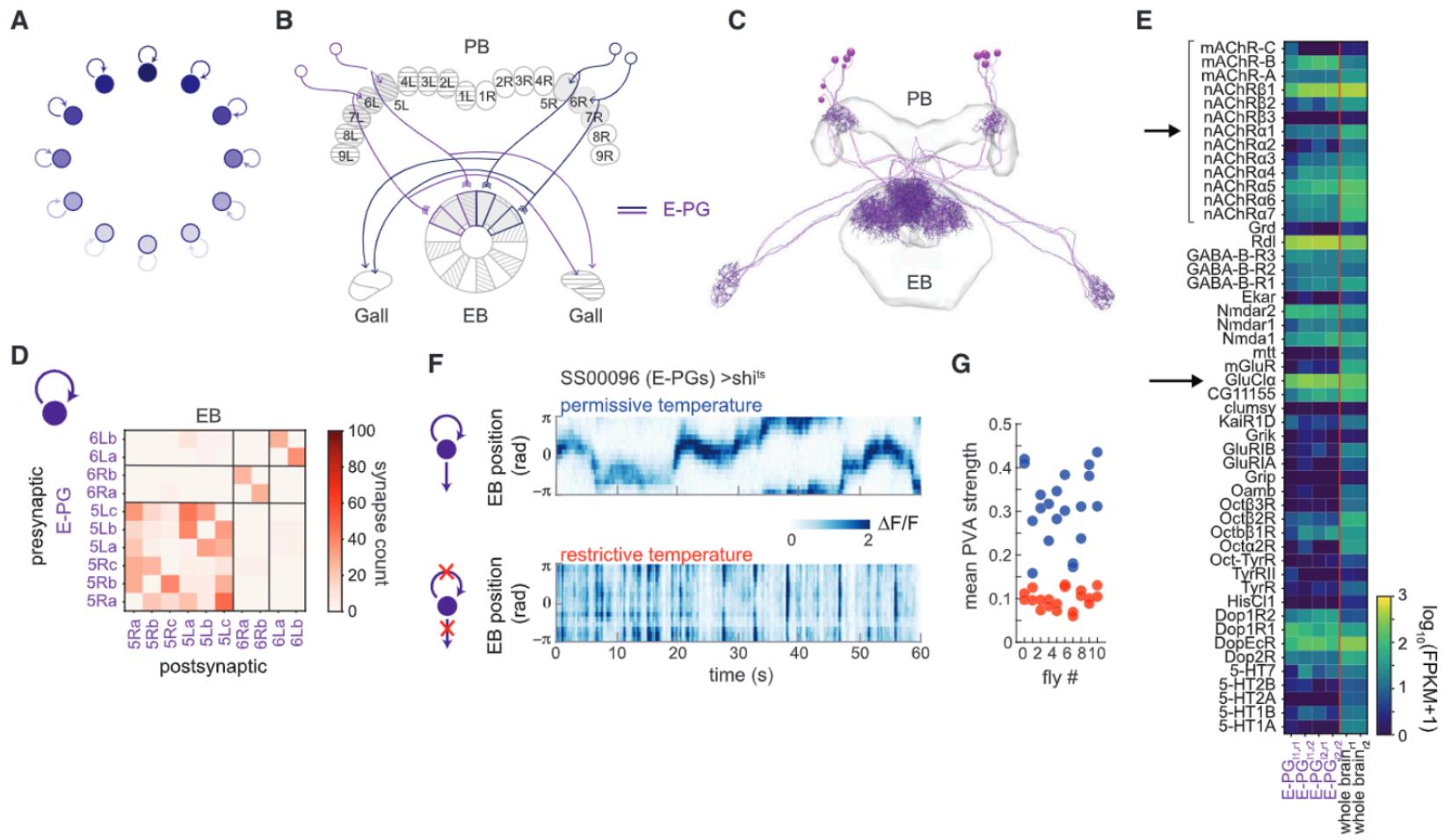
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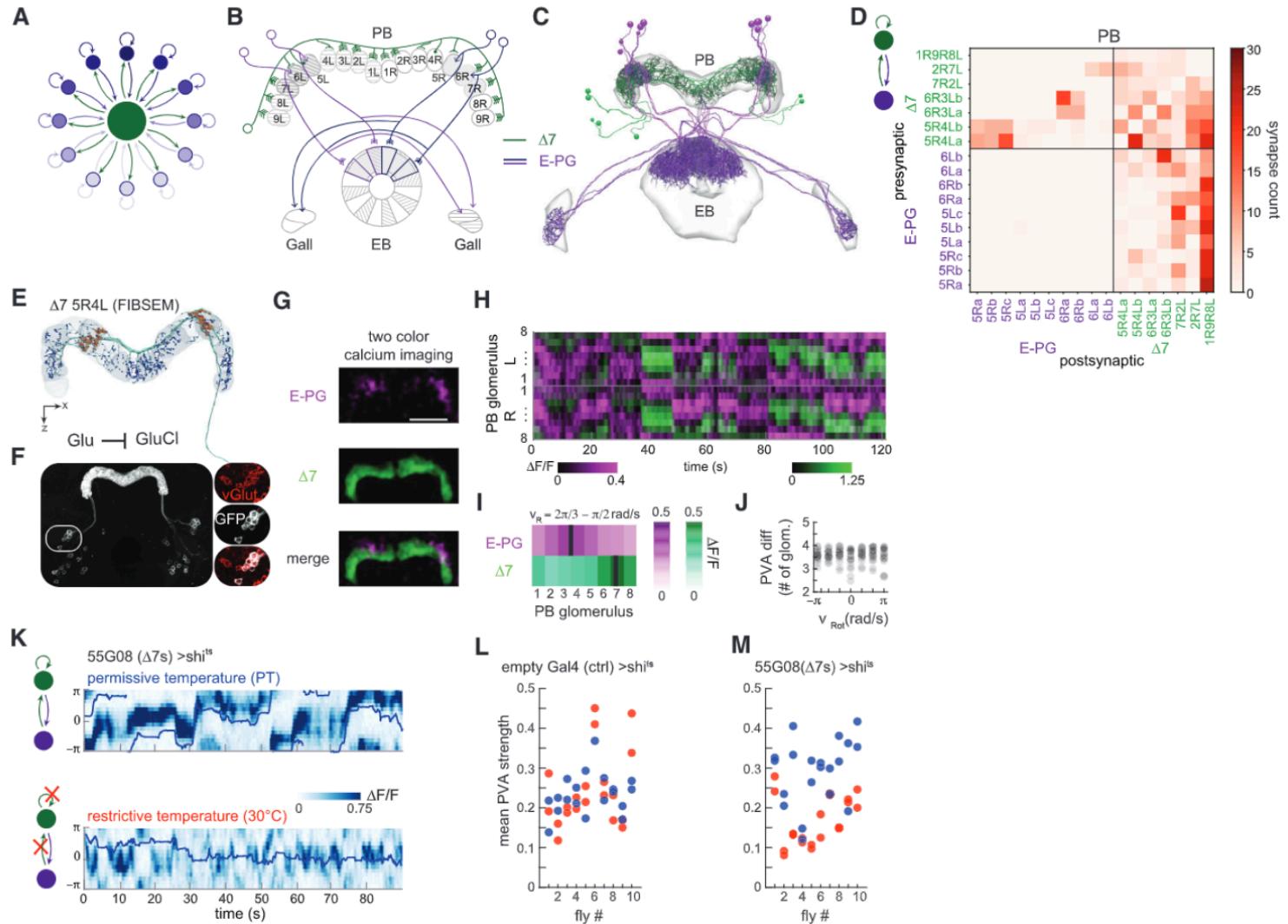


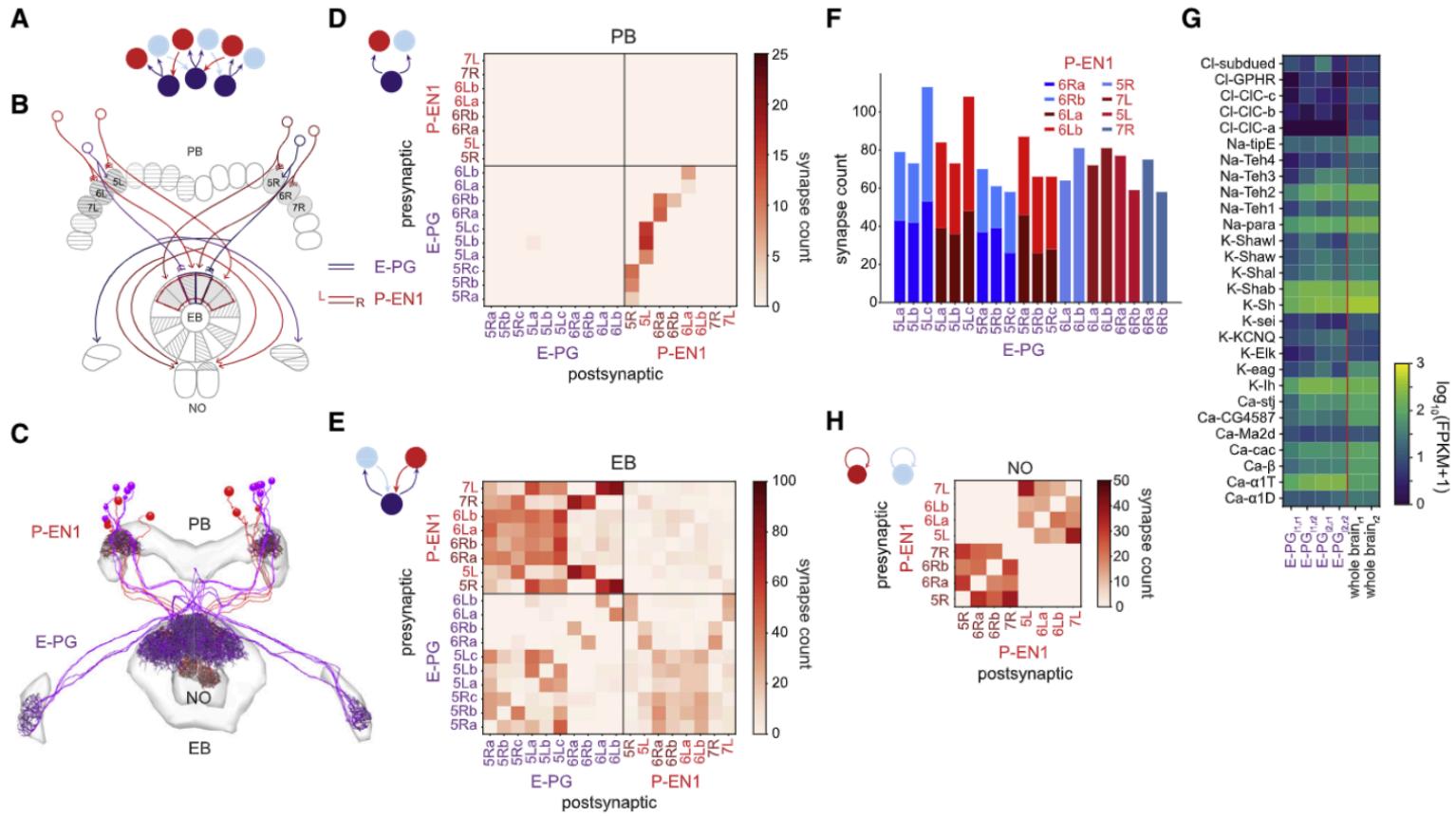
Central complex

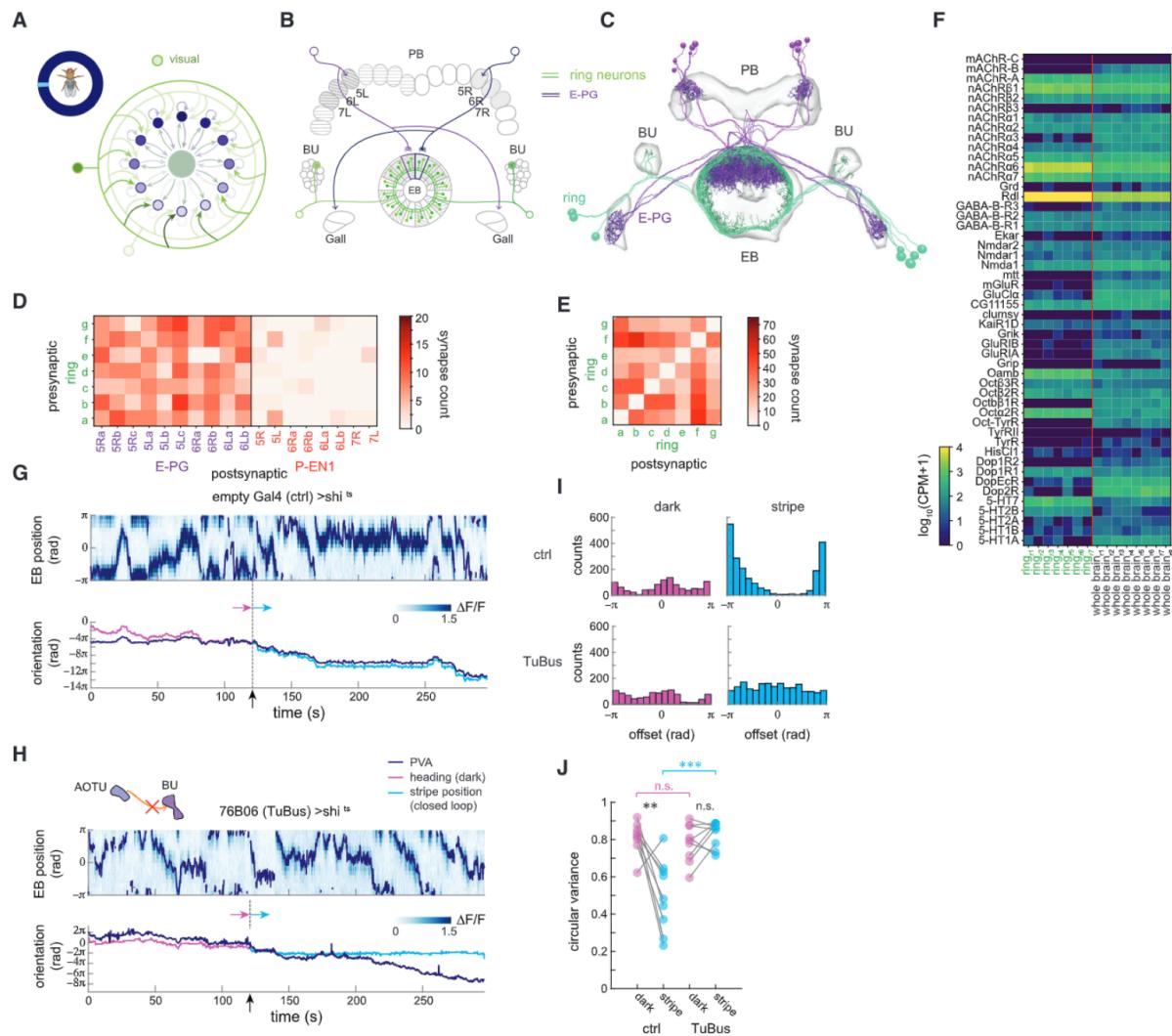
- Ellipsoid body: head directional system
- Protocerebral bridge: integration of self motion / optic flow to velocity
- Nodulus: velocity inputs
- Fan shape body: vector based navigation center

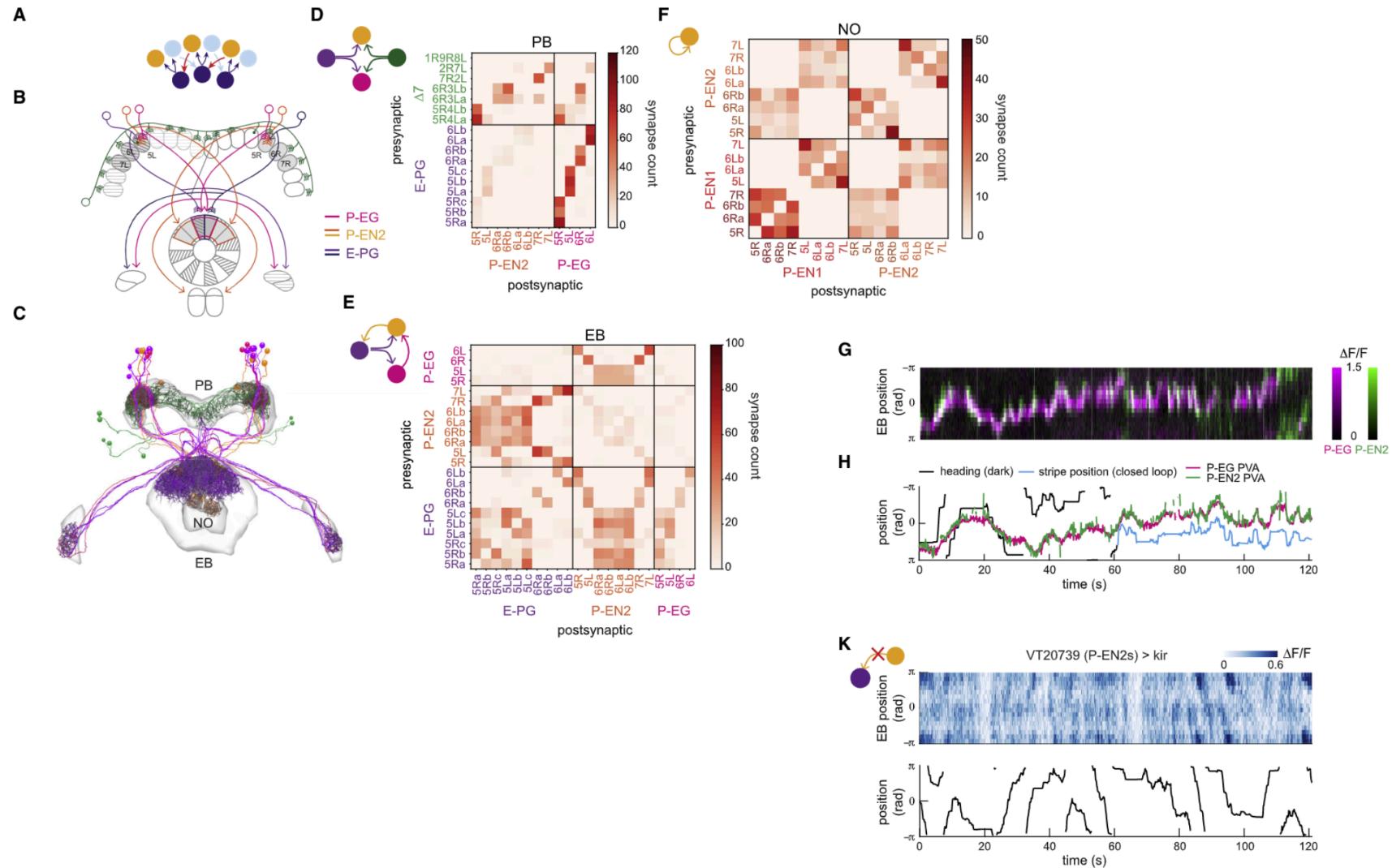


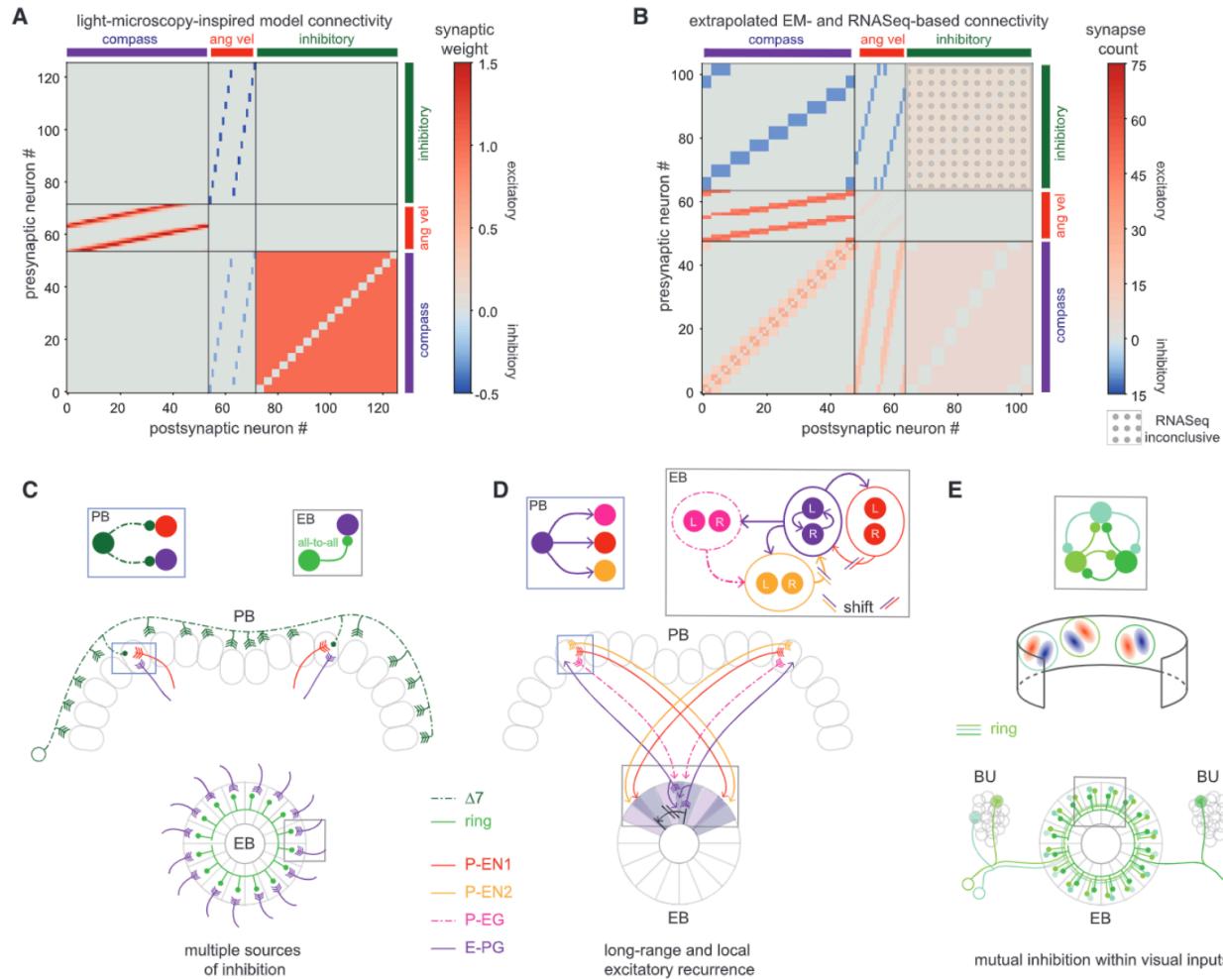




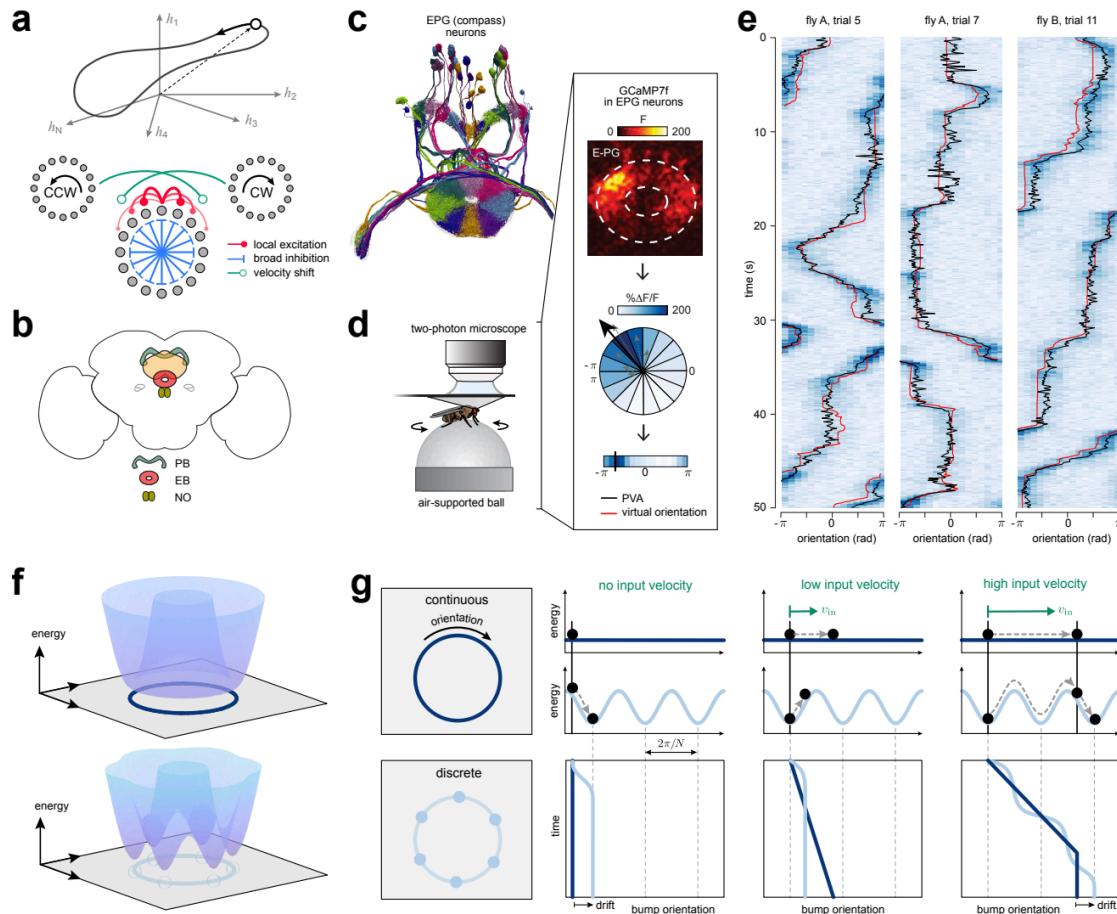


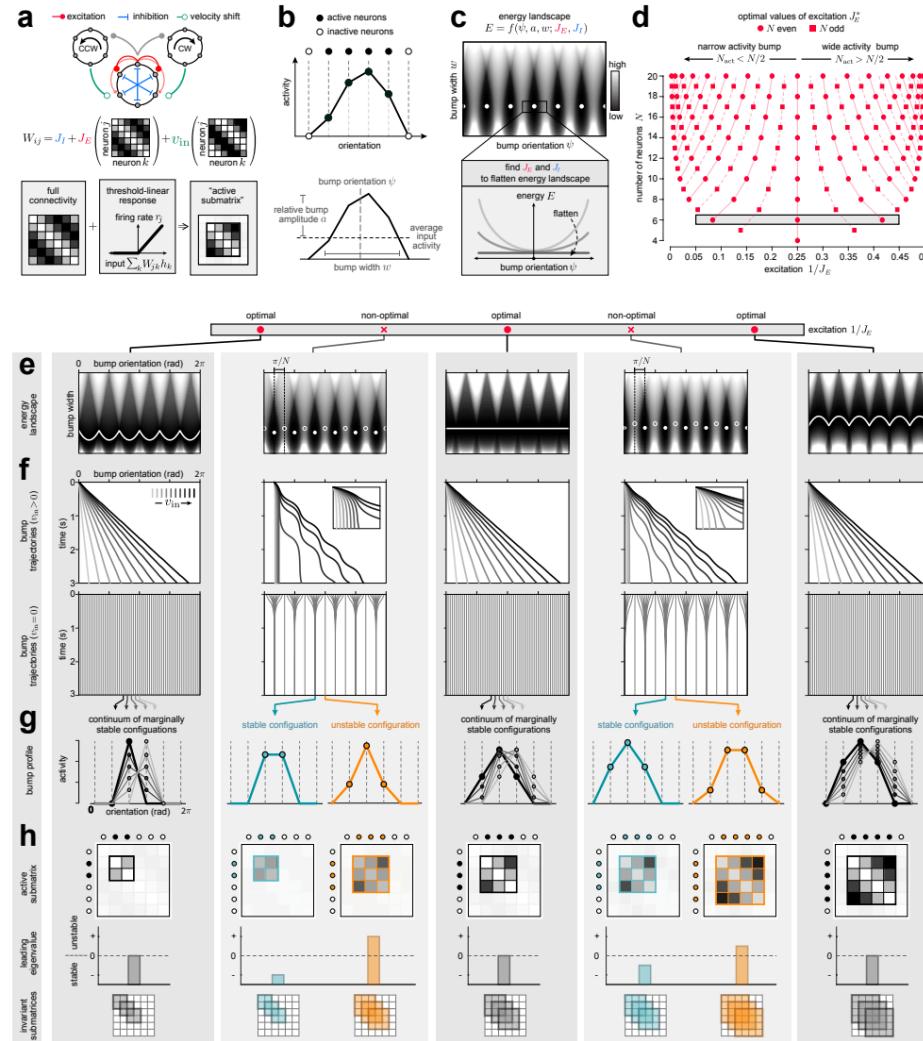


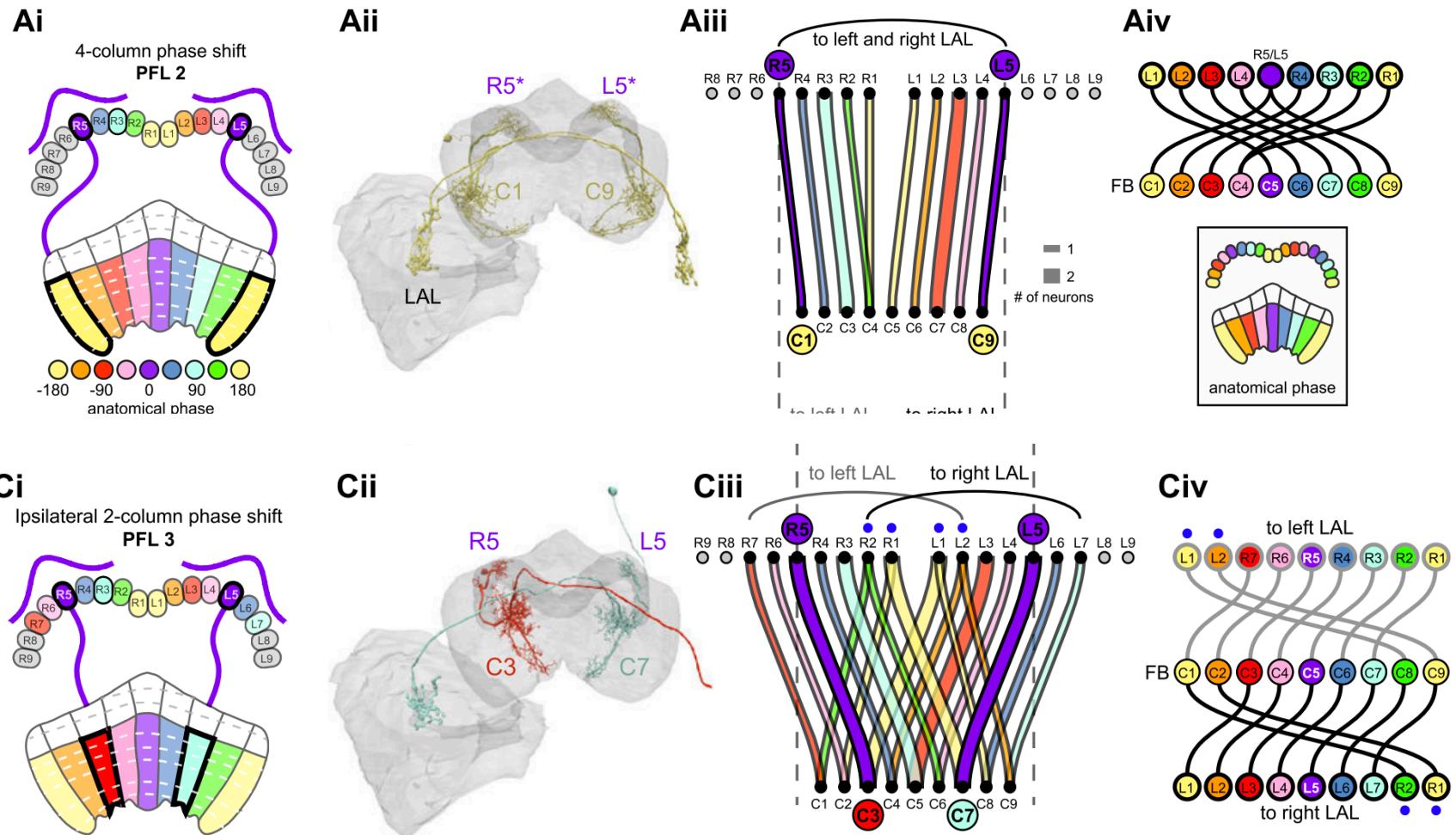




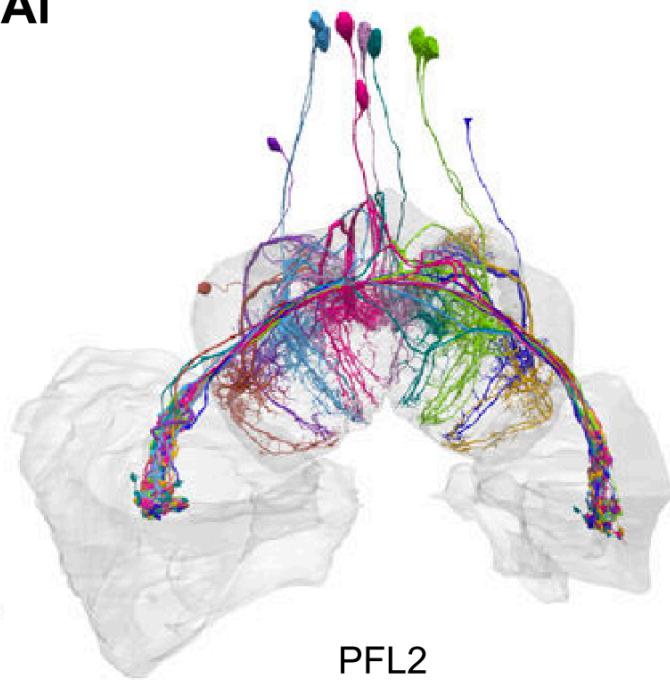
**How can PVA track actual heading
with high accuracy with only
handful of neurons?**





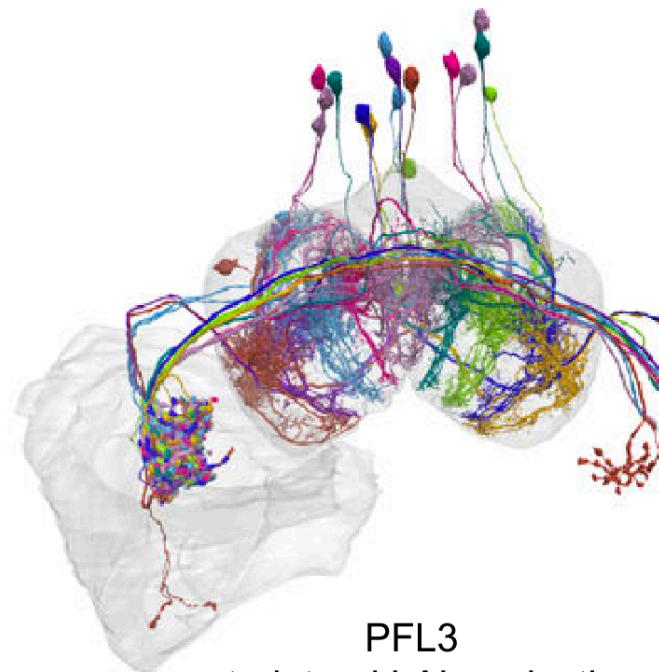


Ai

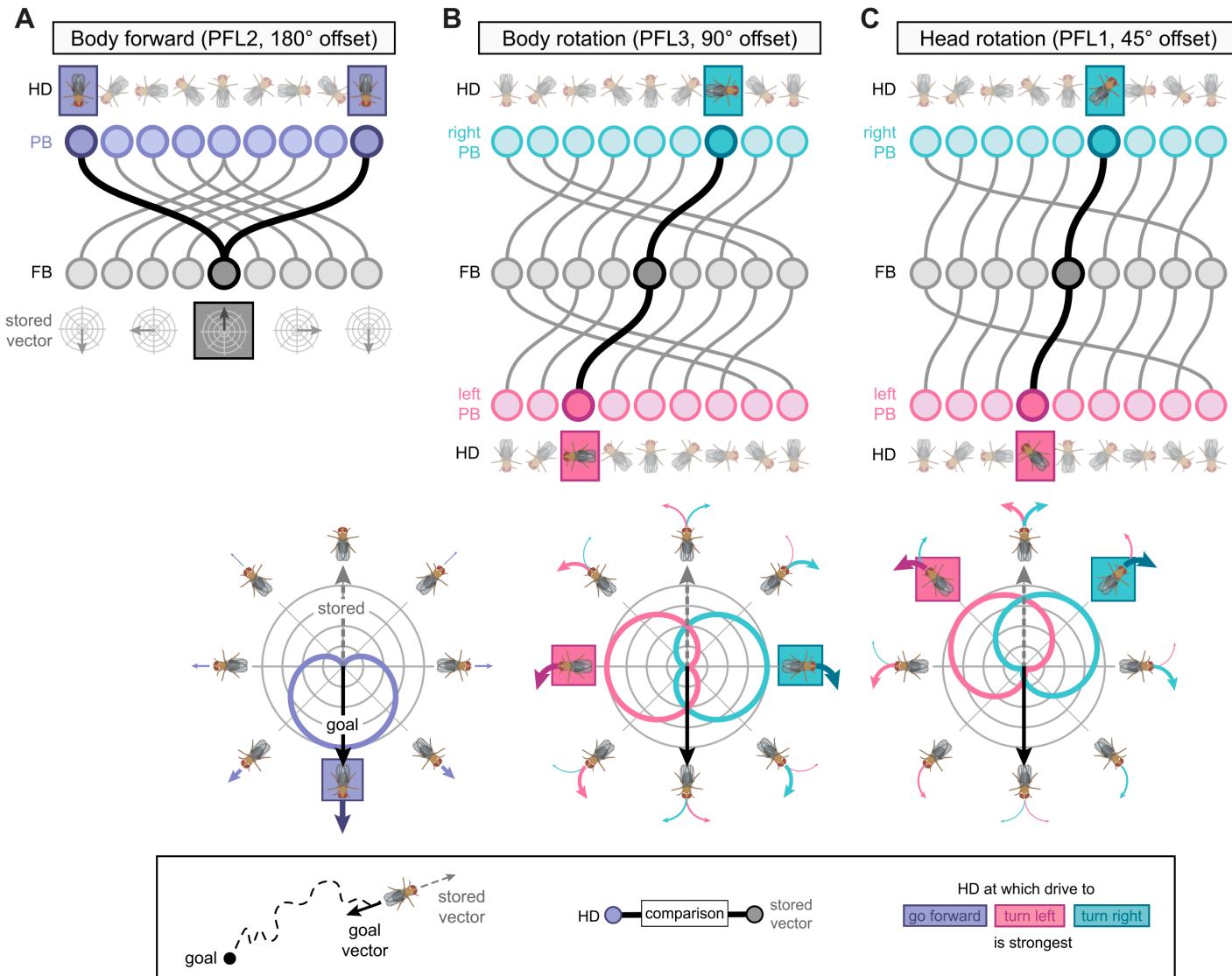


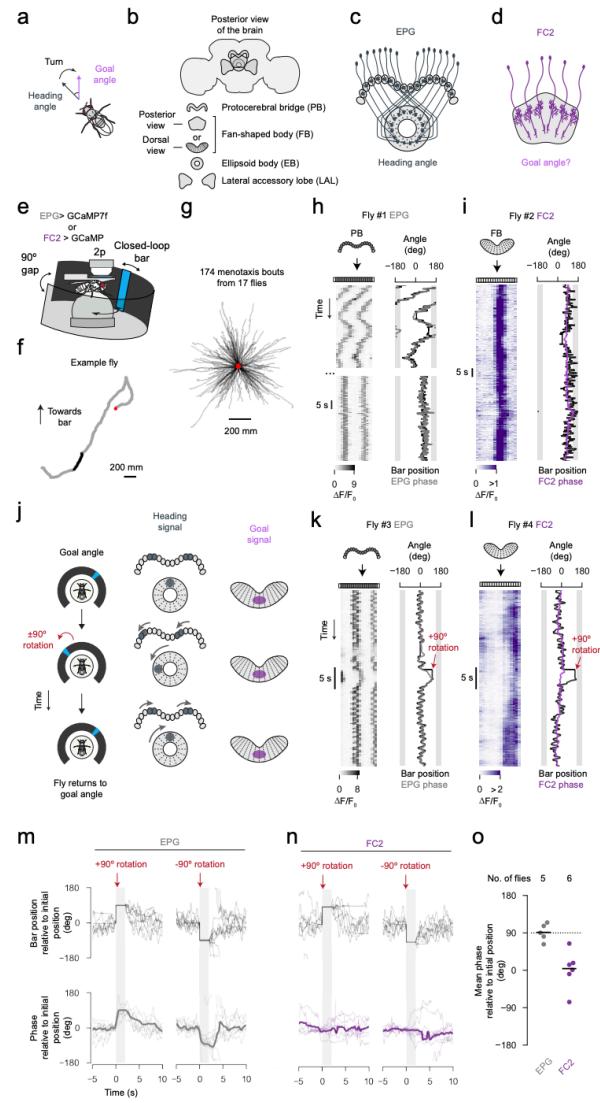
PFL2
bilateral LAL projections
9 columns
12 neurons
4C phase shift

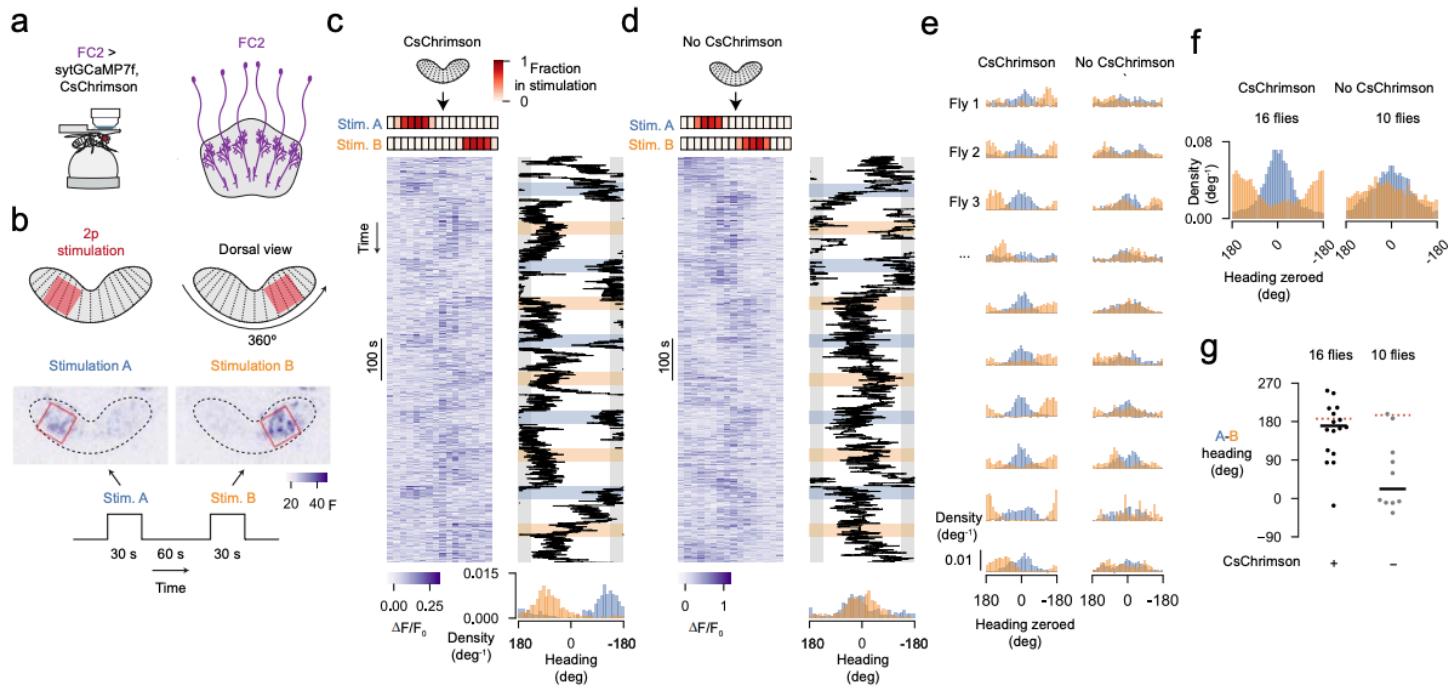
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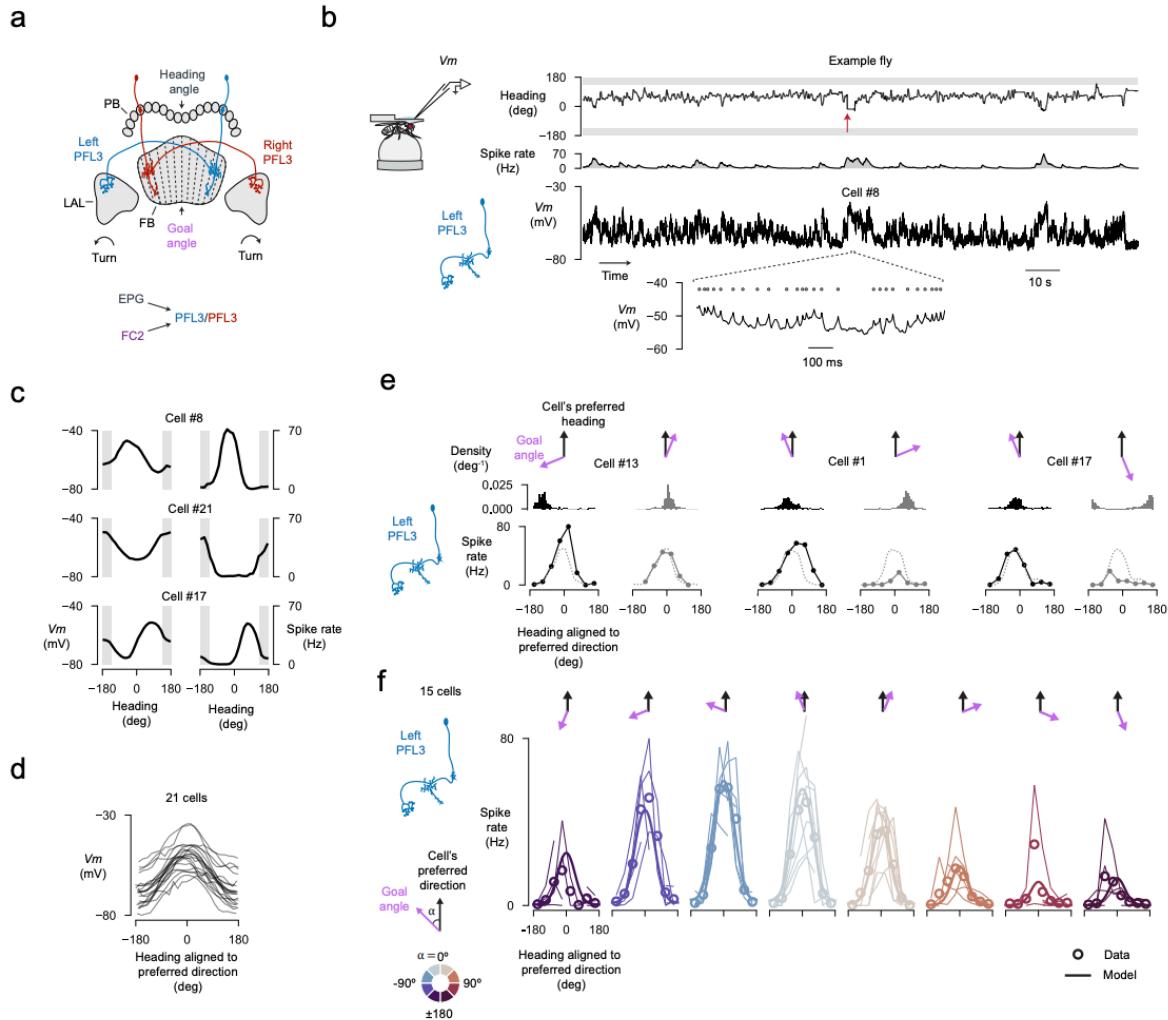


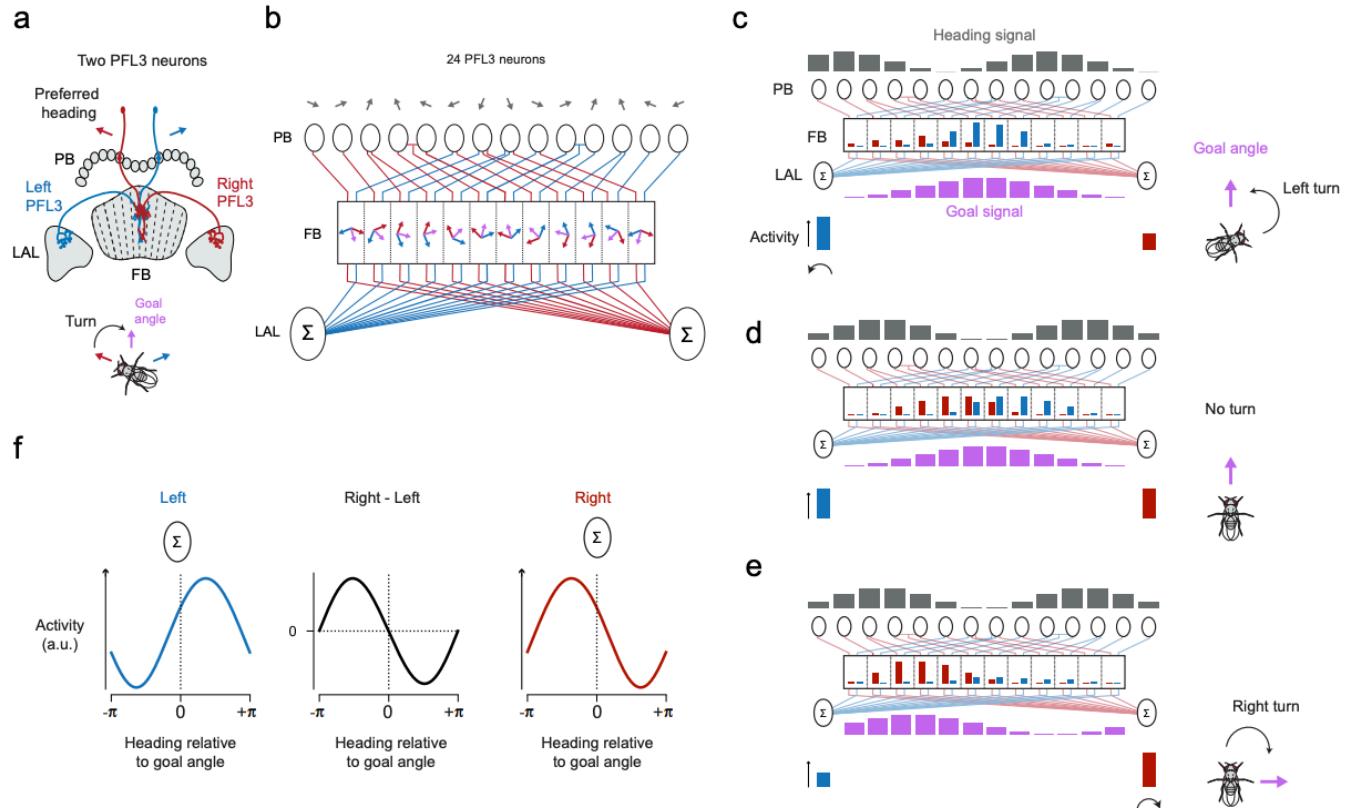
PFL3
contralateral LAL projections
9 columns
24 neurons
2C ipsilateral phase shift

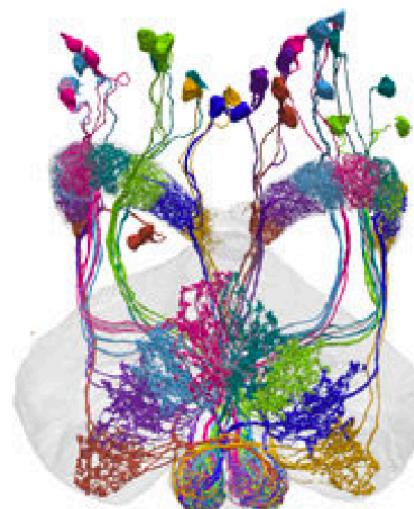
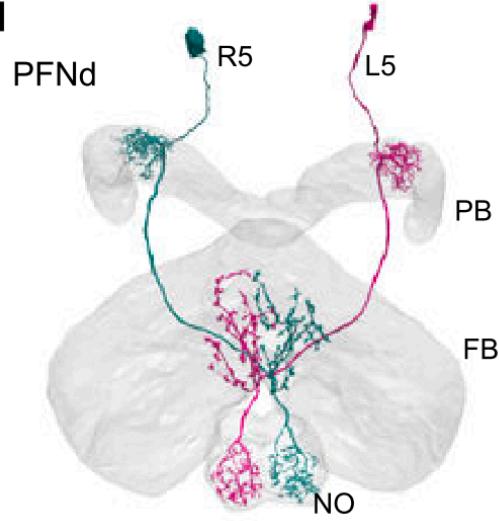










Ai**Bi**

Contralateral phase shift
(all PFNs)

