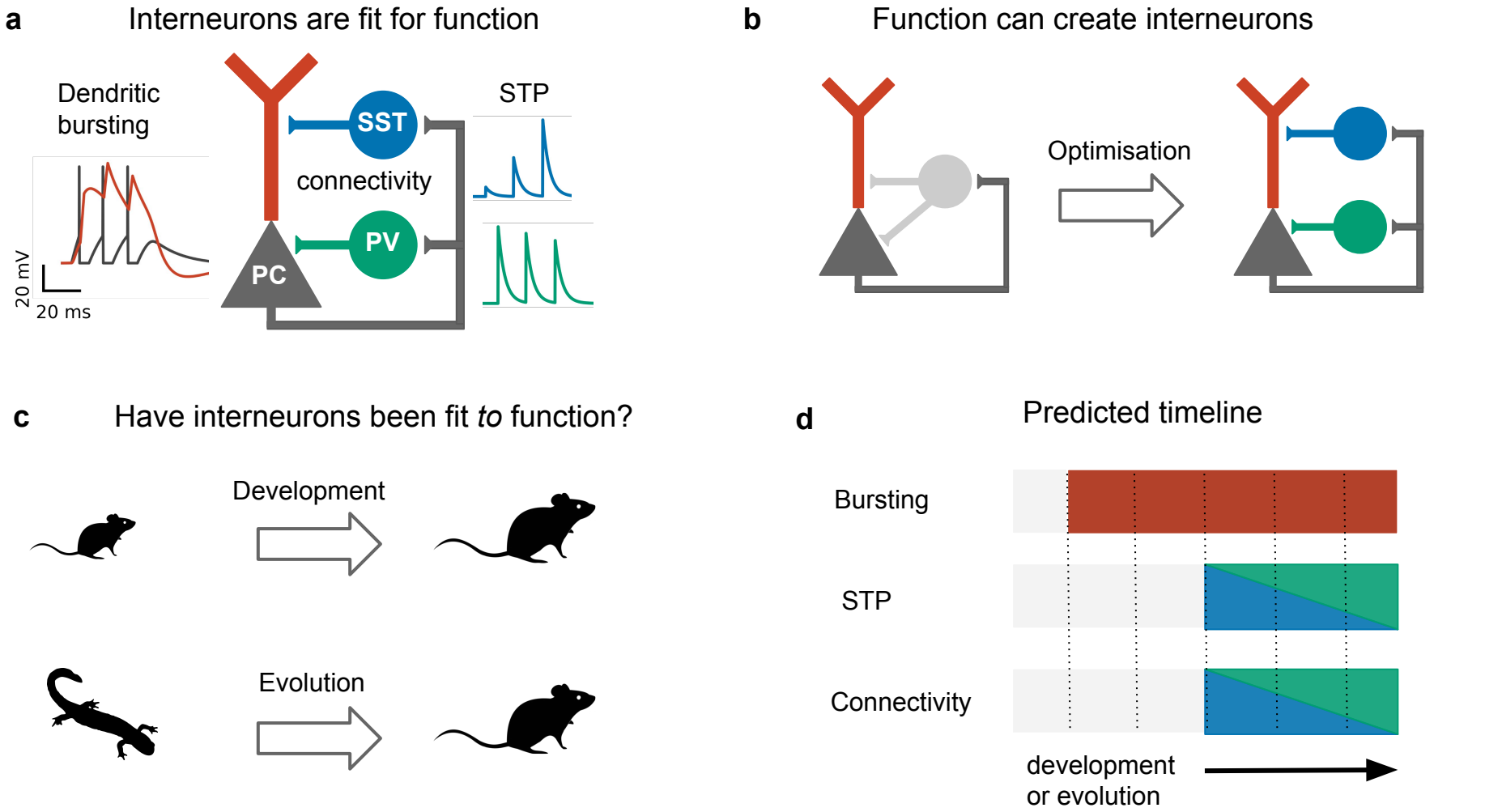
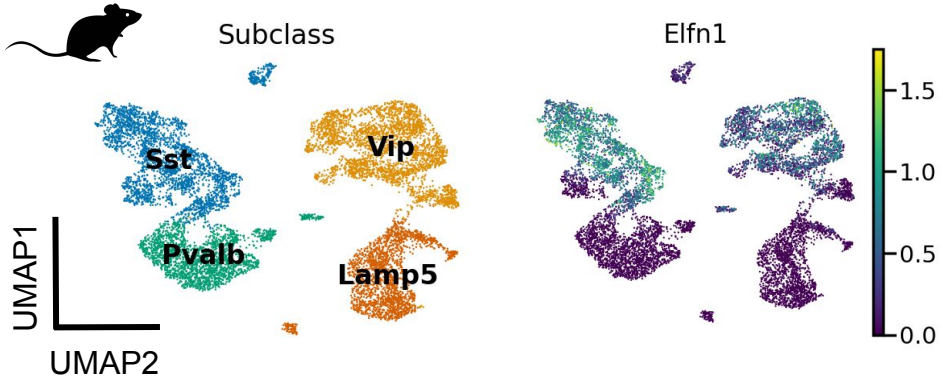
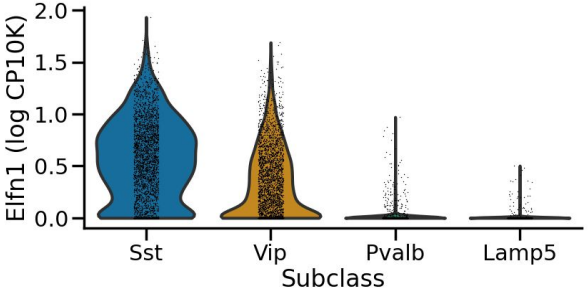

a
Interneurons are fit for function
Dendritic bursting
20 mV
20 ms
SST
PV
PC
connectivity
STP
b
Function can create interneurons
Optimisation
c
Have interneurons been fit *to* function?
Development
Evolution
d
Predicted timeline
Bursting
STP
Connectivity
development or evolution

Mouse interneurons

a

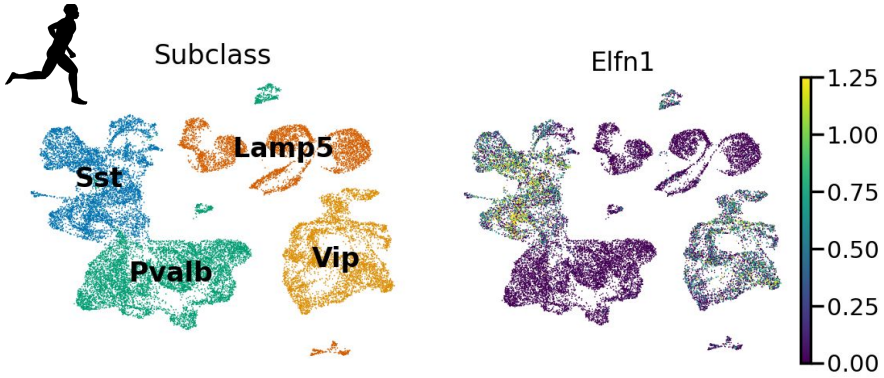


b

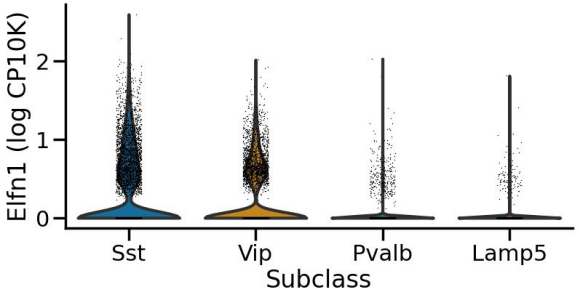


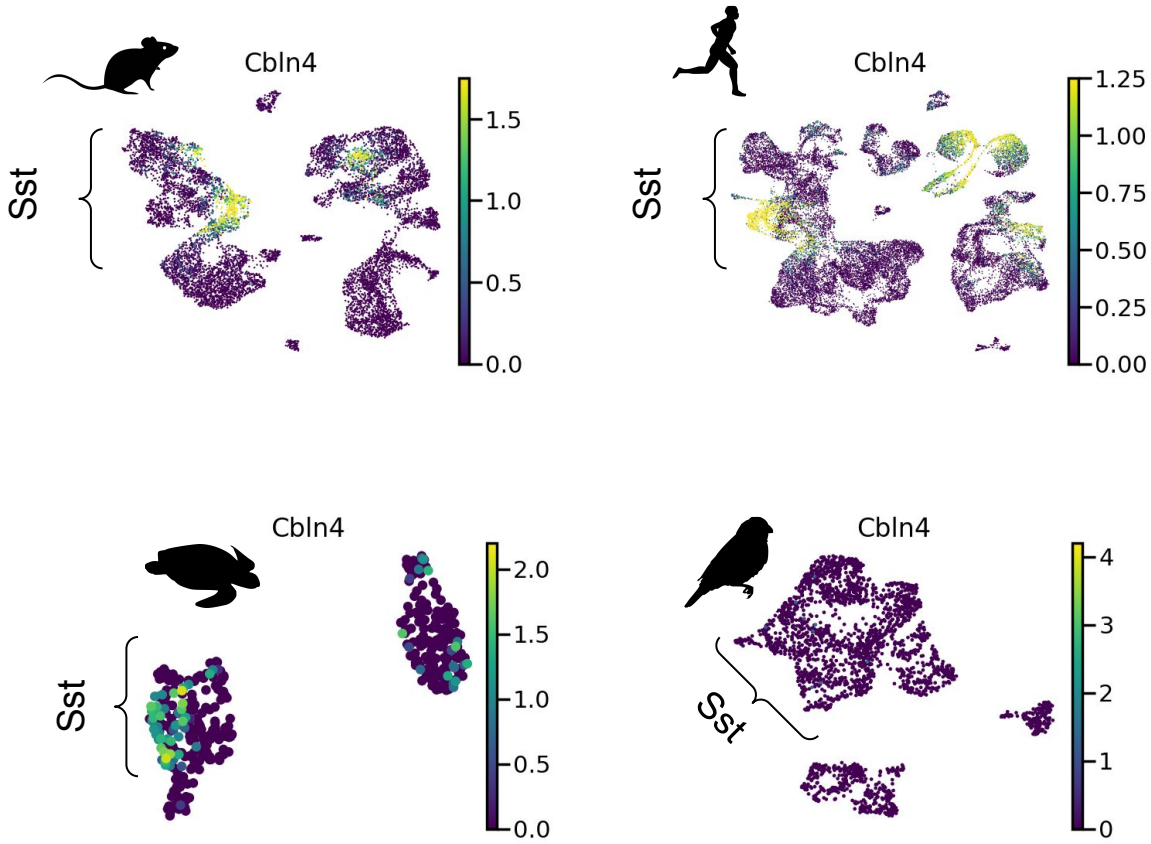
Human interneurons

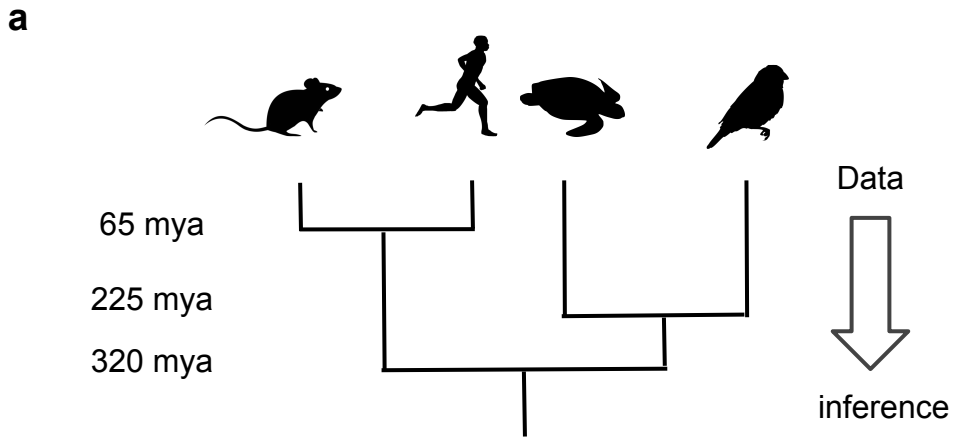
c

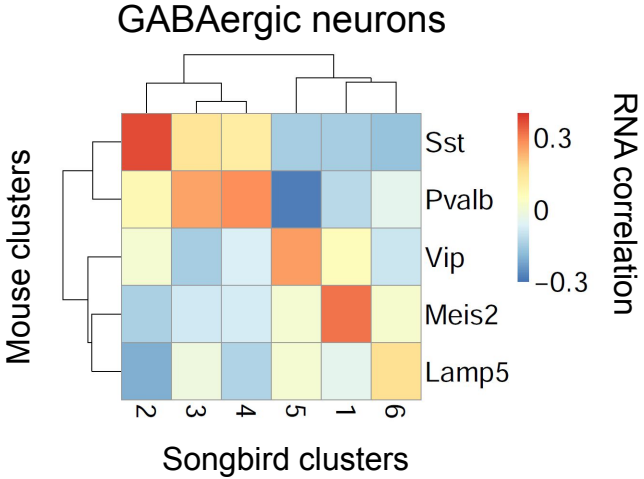


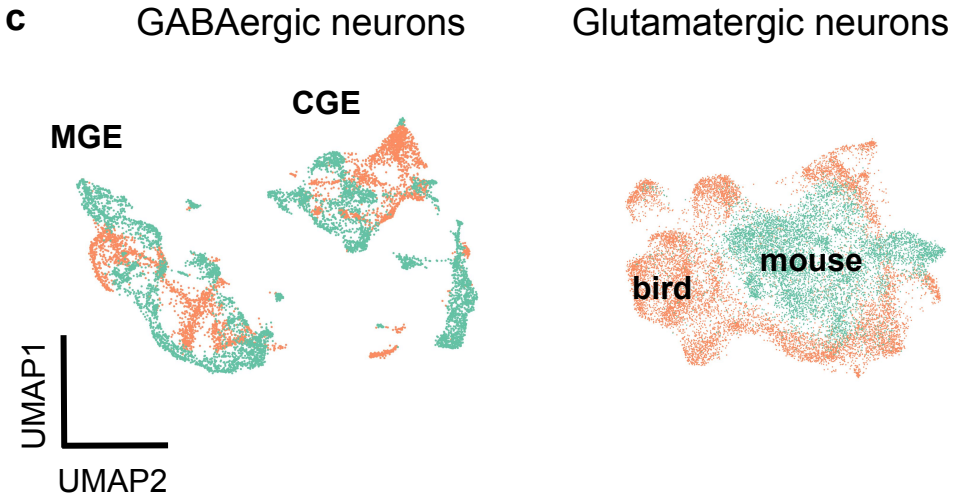
d

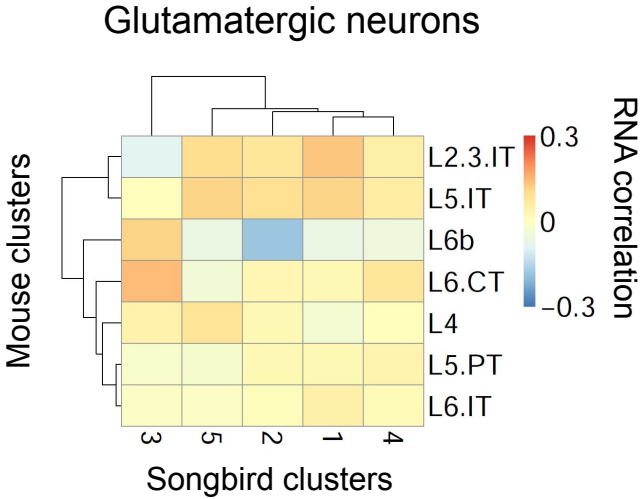



Cbln4
Sst
1.5
1.0
0.5
0.0
Cbln4
Sst
1.25
1.00
0.75
0.50
0.25
0.00
Cbln4
Sst
2.0
1.5
1.0
0.5
0.0
Cbln4
Sst
4
3
2
1
0

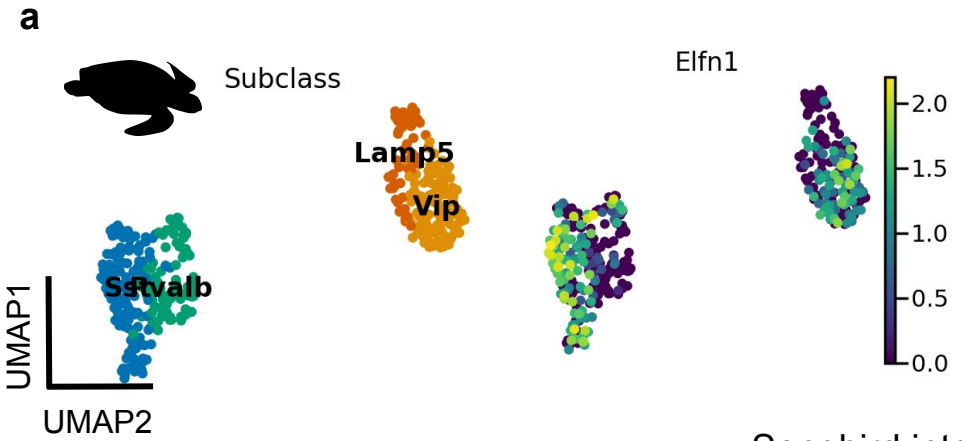

a
65 mya
225 mya
320 mya
Data
inference

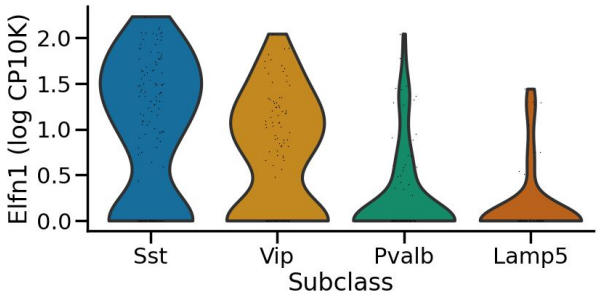

b
GABAergic neurons
Mouse clusters
Sst
Pvalb
Vip
Meis2
Lamp5
2
3
4
5
1
6
Songbird clusters
0.3
0
−0.3
RNA correlation


c
GABAergic neurons
Glutamatergic neurons
MGE
CGE
bird
mouse
UMAP1
UMAP2

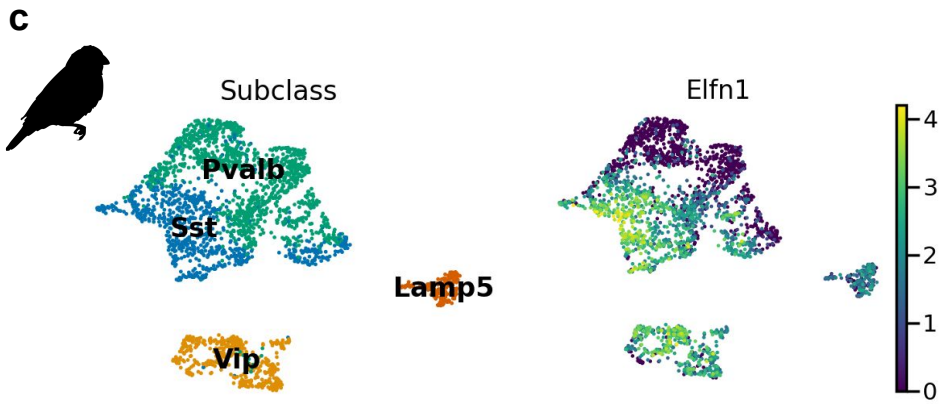

Glutamatergic neurons
Mouse clusters
L2.3.IT
L5.IT
L6b
L6.CT
L4
L5.PT
L6.IT
3
5
2
1
4
Songbird clusters
0.3
0
−0.3
RNA correlation

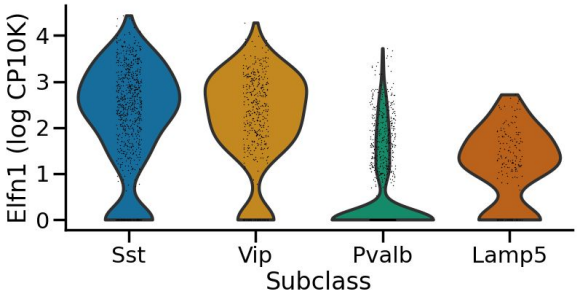
Turtle interneurons

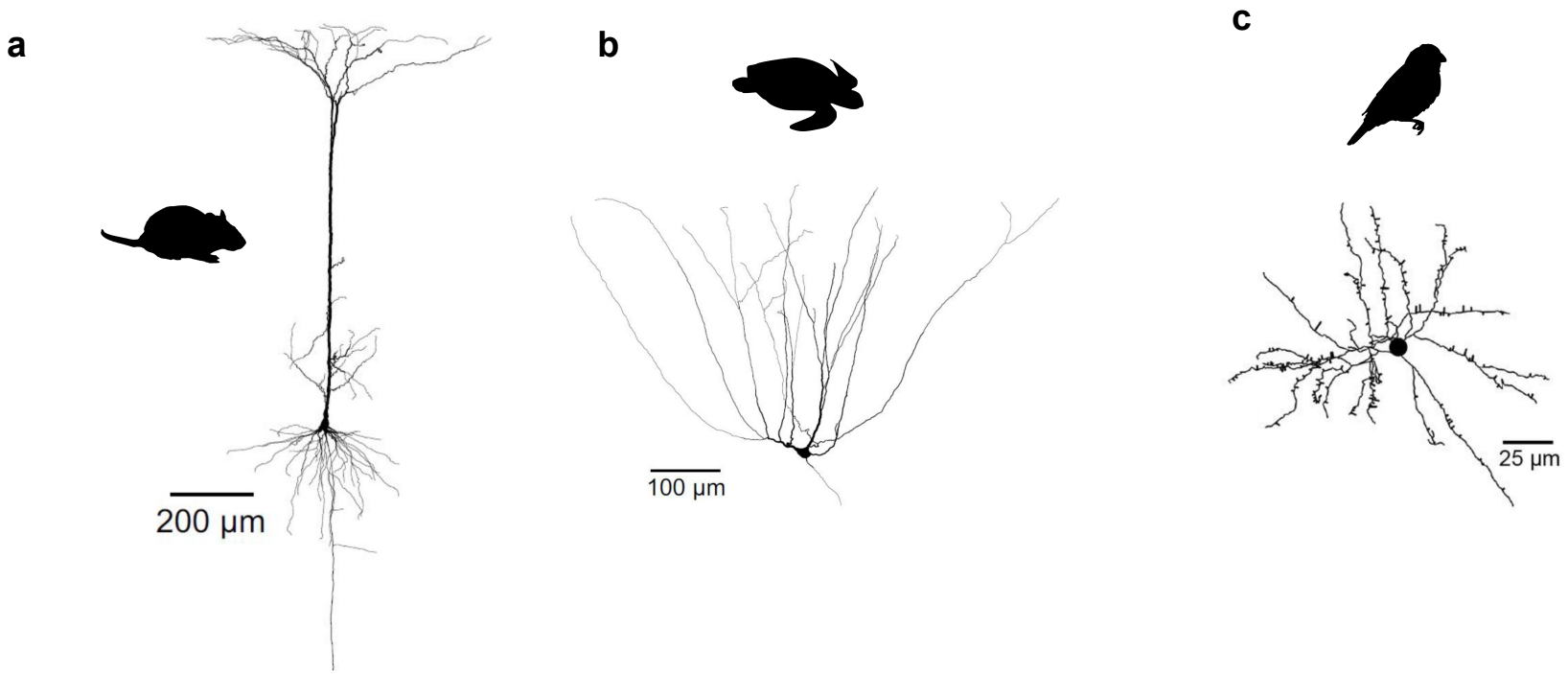




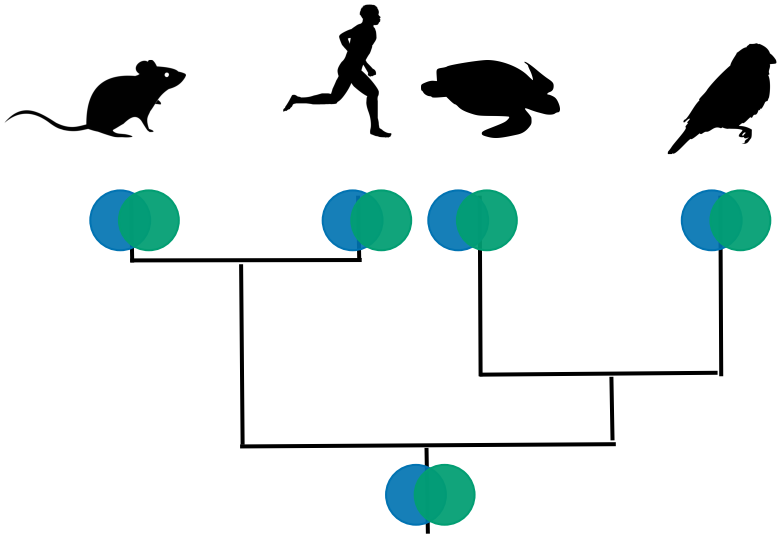
Songbird interneurons



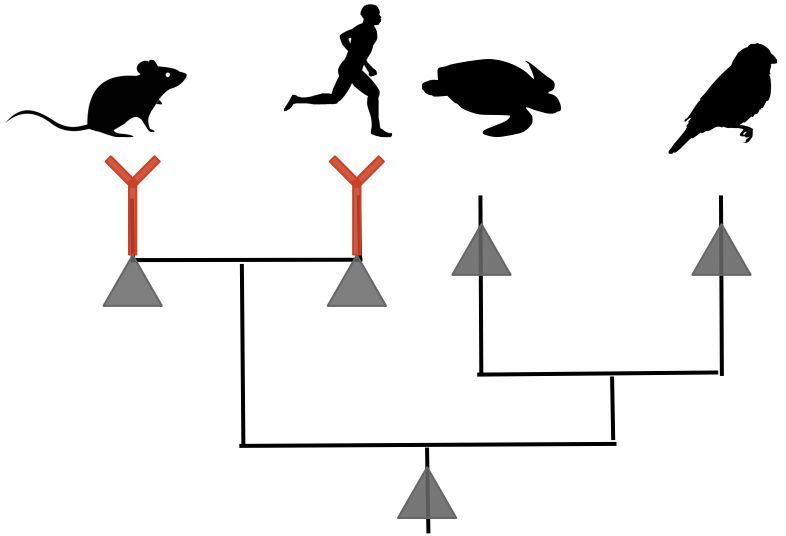



a
200 µm
b
100 µm
c
25 µm

a Interneuron conservation



b Pyramidal innovation



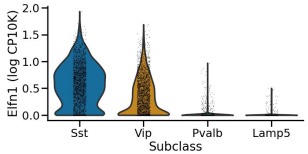
visualize_expression.py

Raw data

preprocess.R

AnnData files

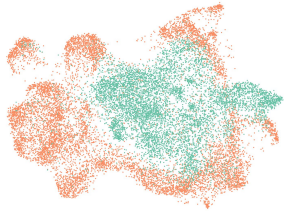
UMAPs & Violin plots of Elfn1 & Cbln4 expression



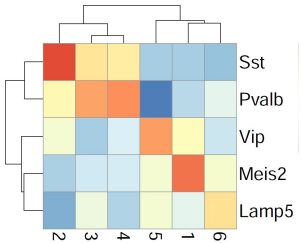
Mouse: Tasic et al. 2018
Turtle: Tosches et al. 2018
Human: Bakken et al. 2021
Songbird: Colquitt et al. 2021

integration.R

UMAPs of integrated data



Seurat files

correlation.R

Correlation matrices