

# Circuit basis for functional heterogeneity of principal neurons in sensory cortex

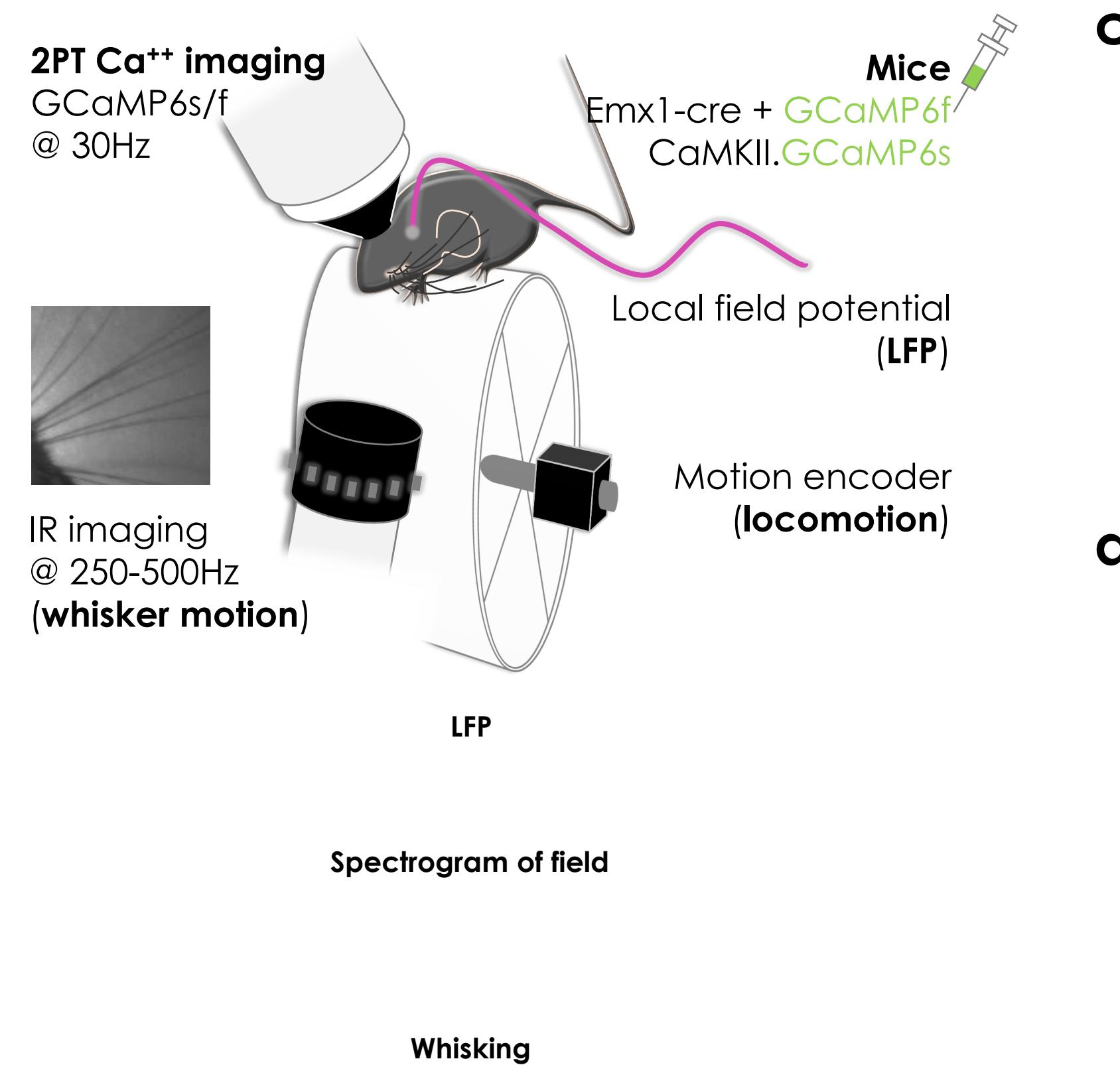
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## INTRODUCTION

### 1 Exploratory behavior



### 2 Subpopulations of neurons in S1bf encode exploratory behavior

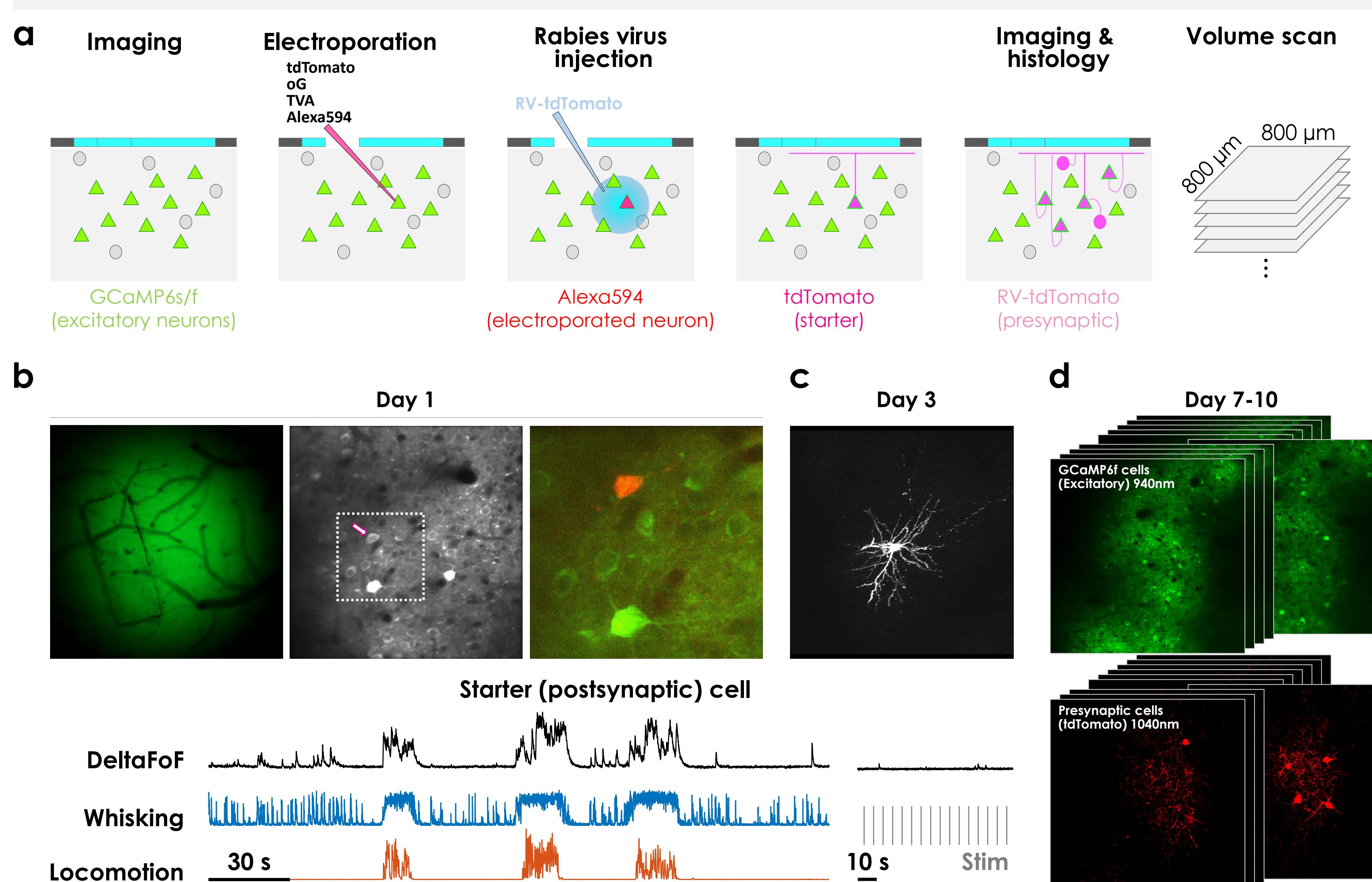
a b

### 3 Neuronal activity from S1bf can predict exploratory behavior

### 6 Anatomical organization of presynaptic ensembles

### 4 Correlation of neural activity with behavior is highly stable

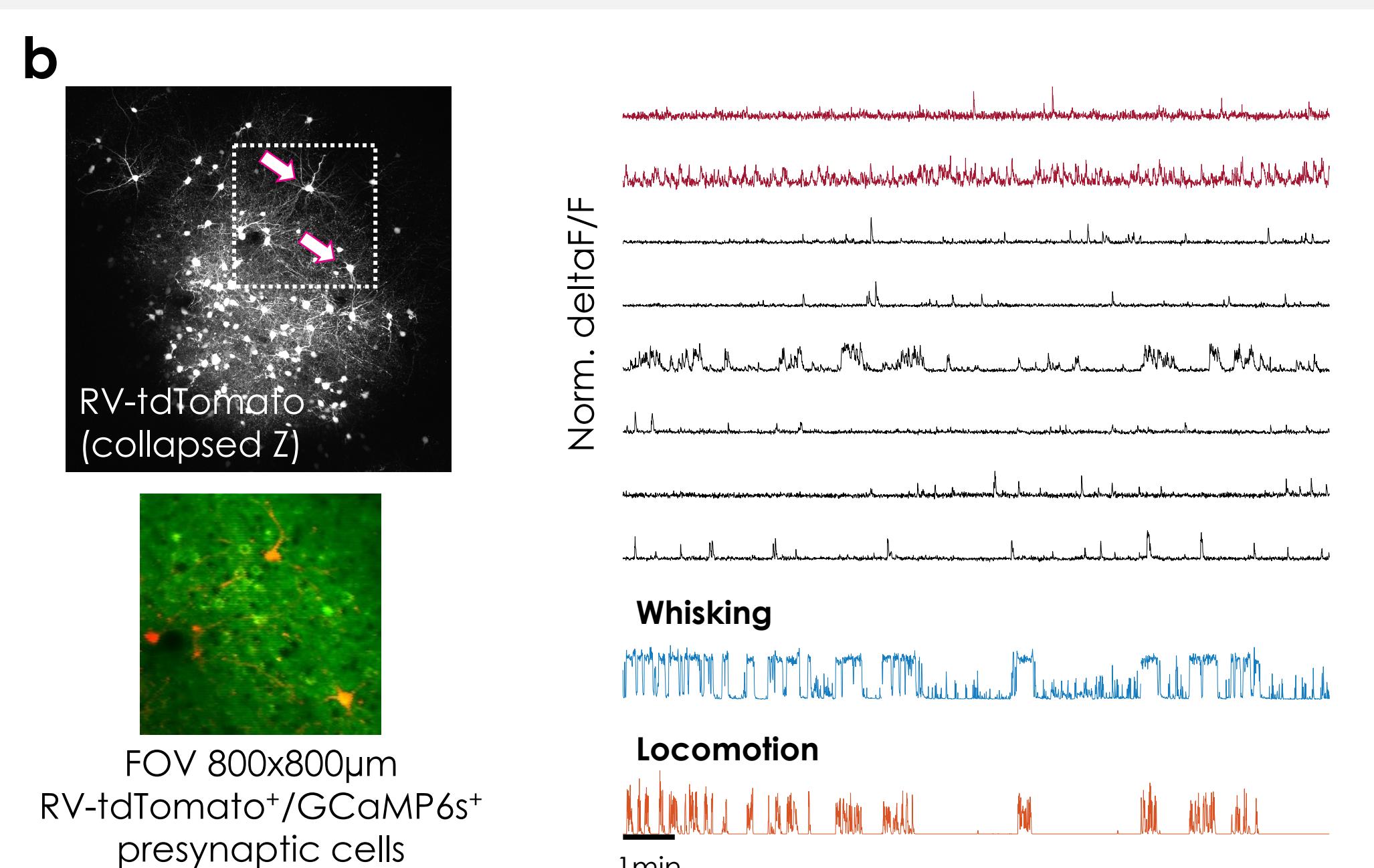
### 5 Probing presynaptic network of a functionally-identified neuron



**Monosynaptic retrograde tracing from a single behaviorally-defined excitatory neuron.** **a)** Experimental outline. **b)** Electroporation of an example exploratory behavior-predicting neuron. Left: cranial window with a custom-made opening. Middle: 2PT Ca<sup>++</sup> imaging FOV; arrow denotes the neuron selected for electroporation. Right: neuron filled with Alexa594 upon electroporation. Lower: selected neuron behavioral tuning and (lack of) response to whisker stimulation. **c)** Neuron expressing tdTomato 3 days after electroporation. **d)** Volume imaging.

### 7 Functional properties of presynaptic ensembles

a



## SUMMARY

## ACKNOWLEDGEMENTS

## FUNDING