

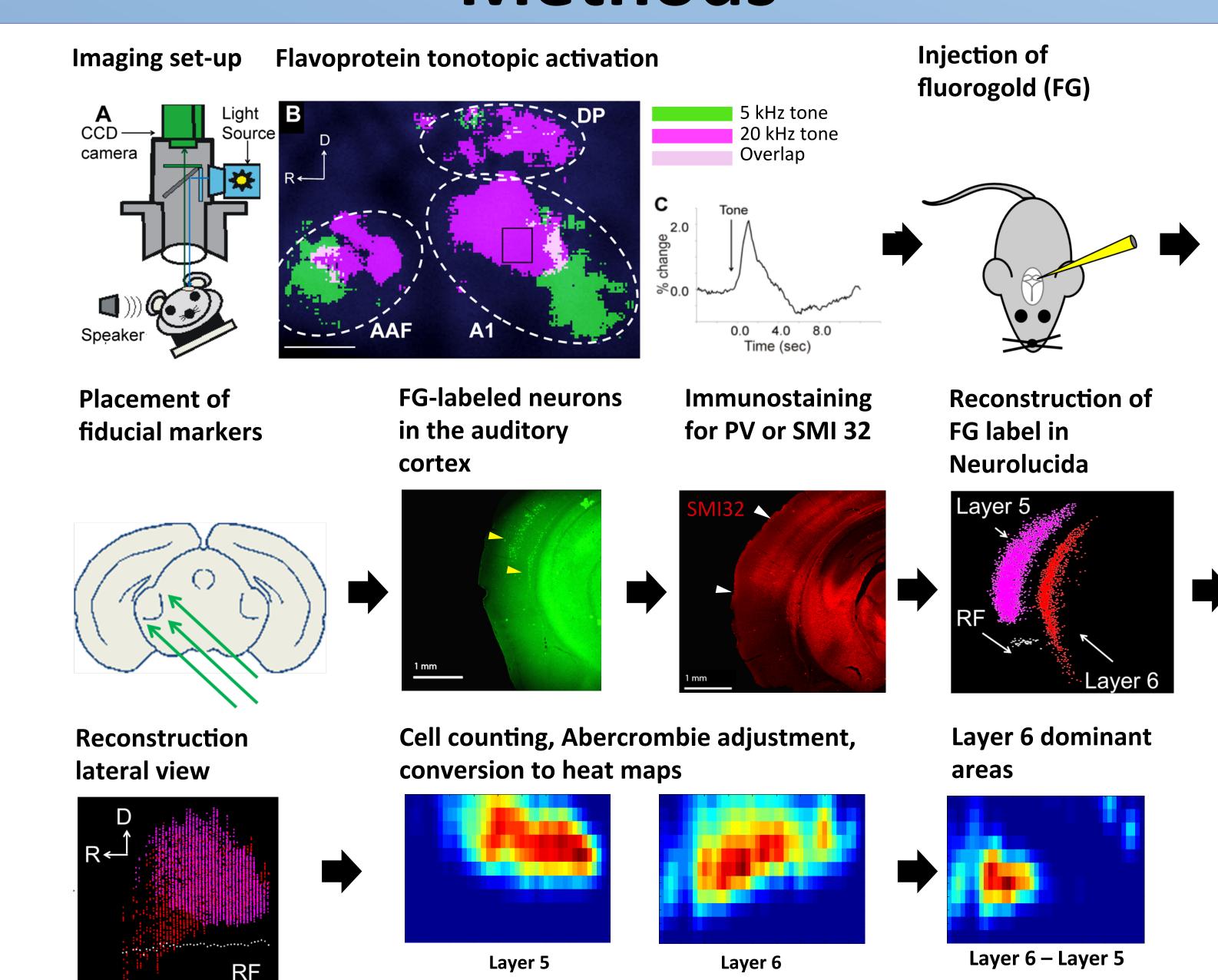
II L L I N O I S Layer-specific differences in the mouse auditory corticocollicular pathway: an anatomical study

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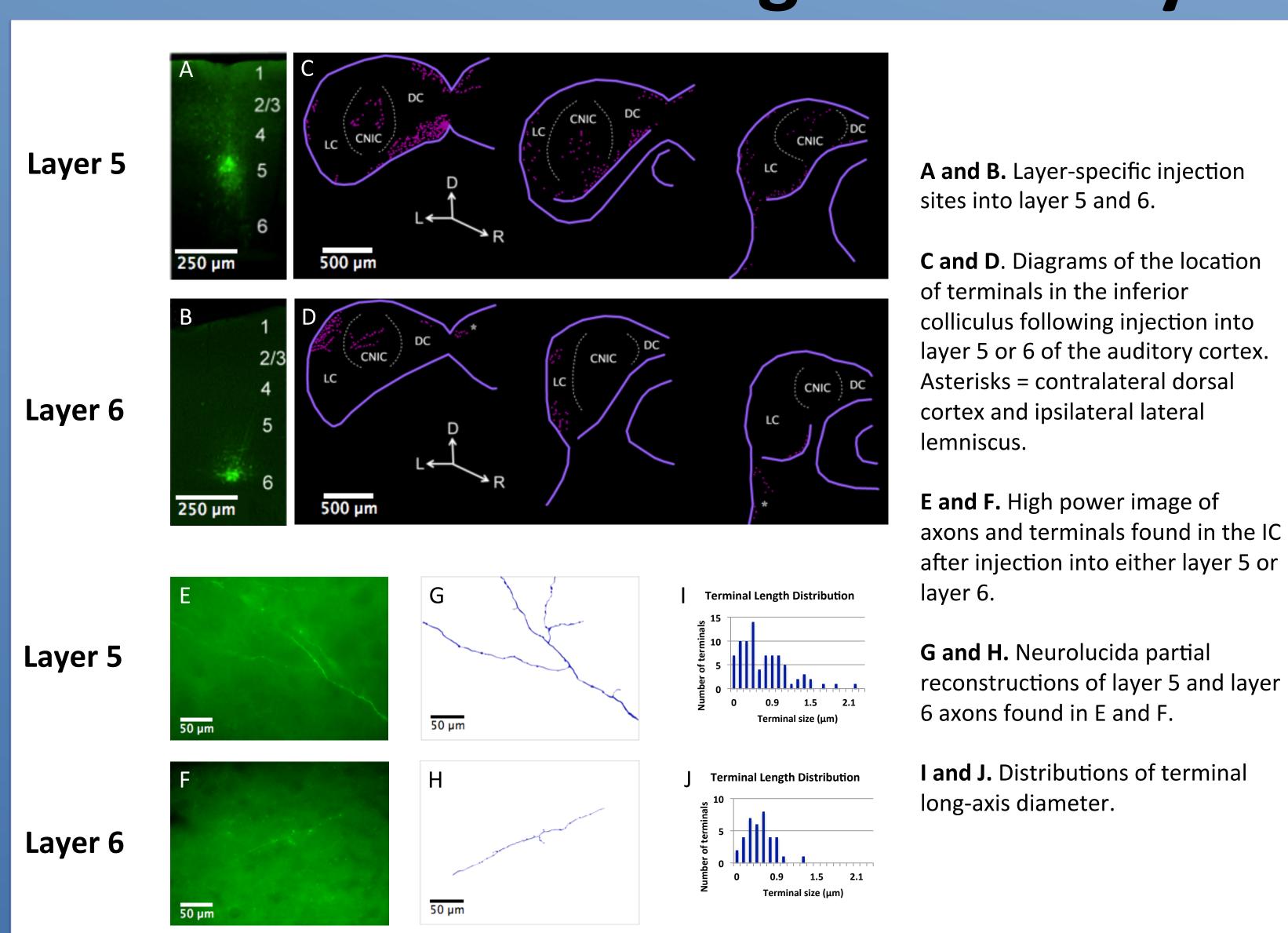
Introduction

- The auditory corticocollicular pathway consists of two distinct populations of cells one emanating from cortical layer 5 and the other from deep layer 6 - that differ in terms of their firing properties and cellular morphology.
- In the present study, we sought to determine whether layer 5 and layer 6 corticocollicular cells differ in terms of their regions of origin within the auditory cortex and their termination patterns within the inferior colliculus.

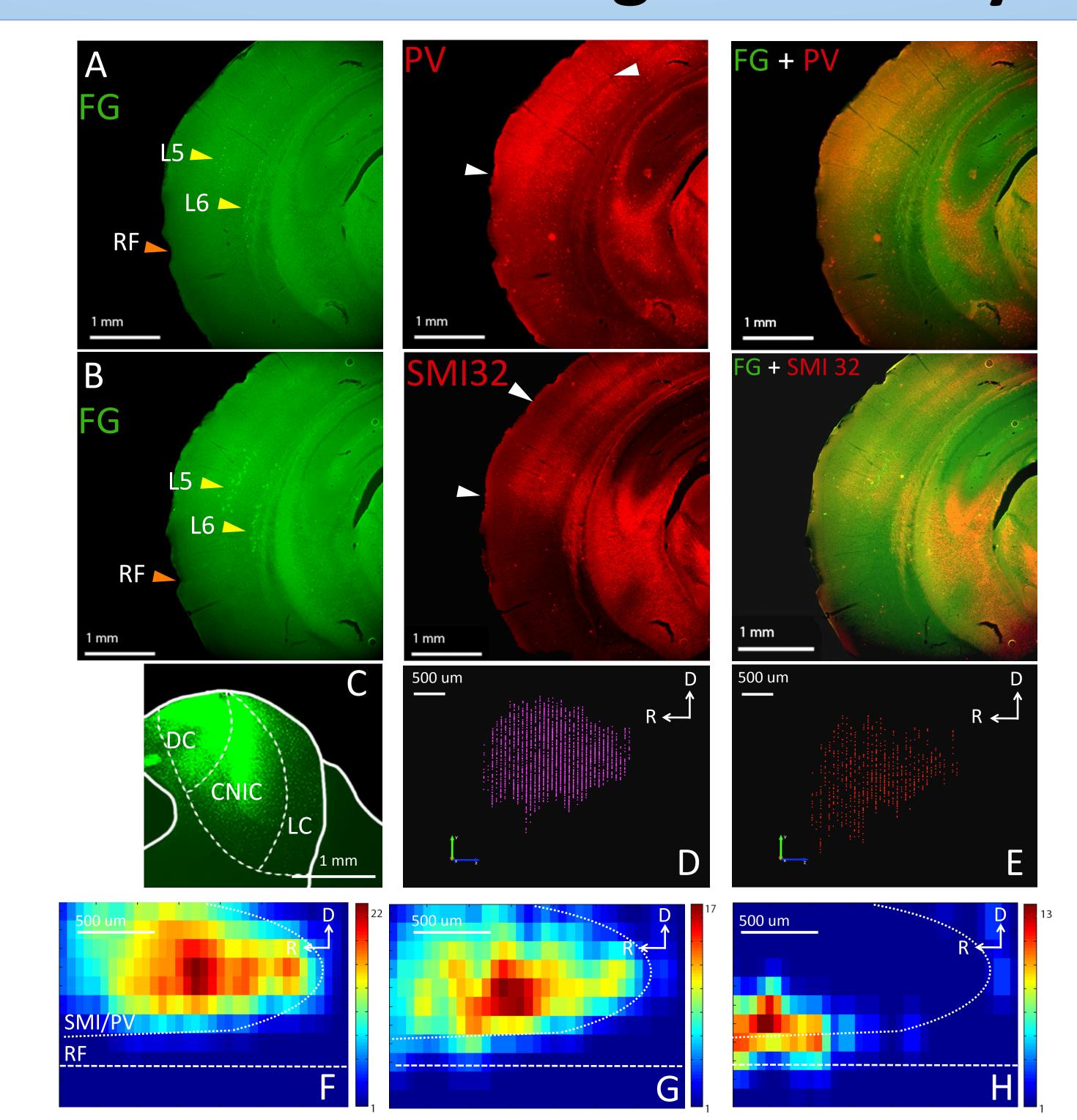
Methods



Results of Anterograde Study

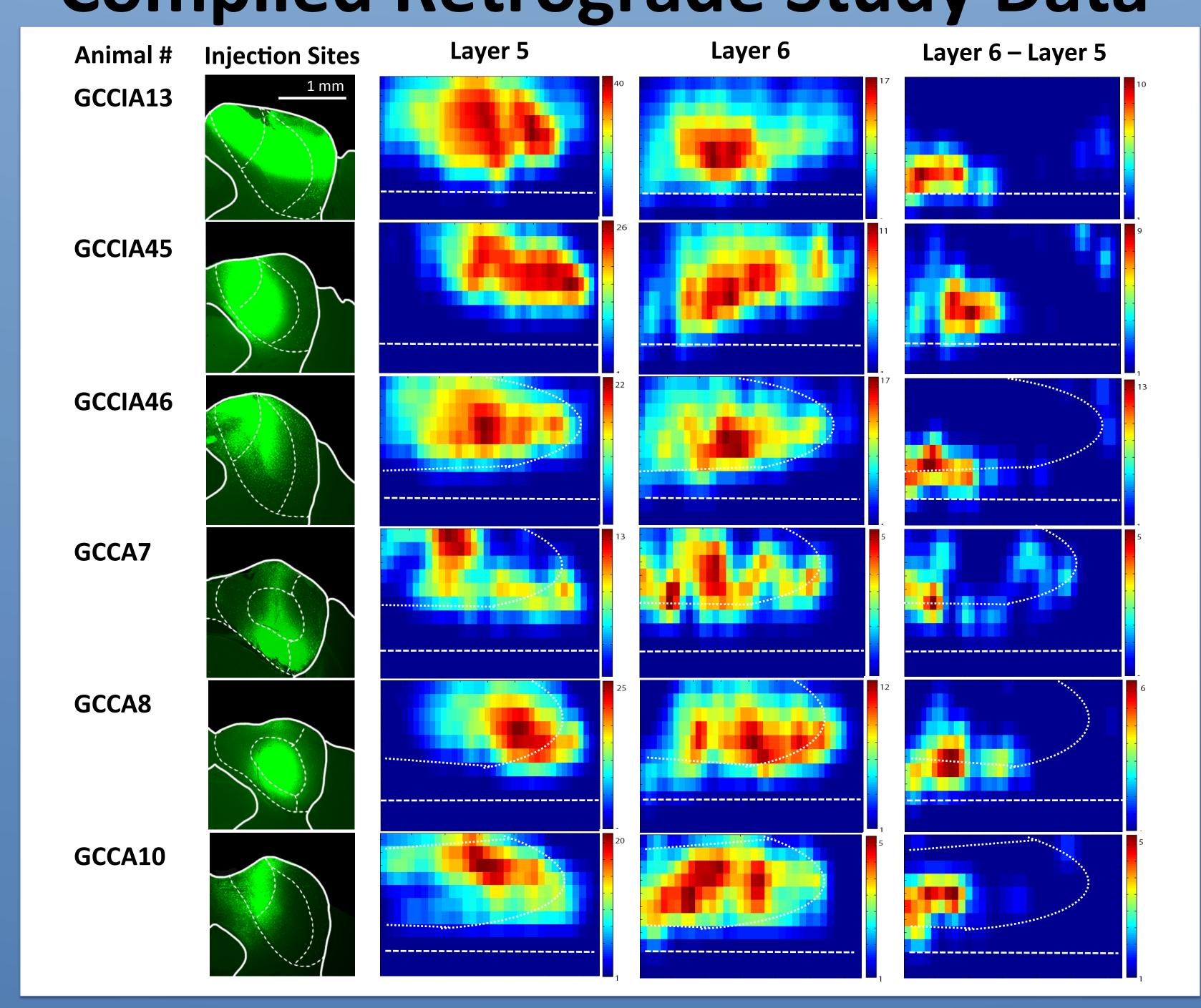


Results of Retrograde Study

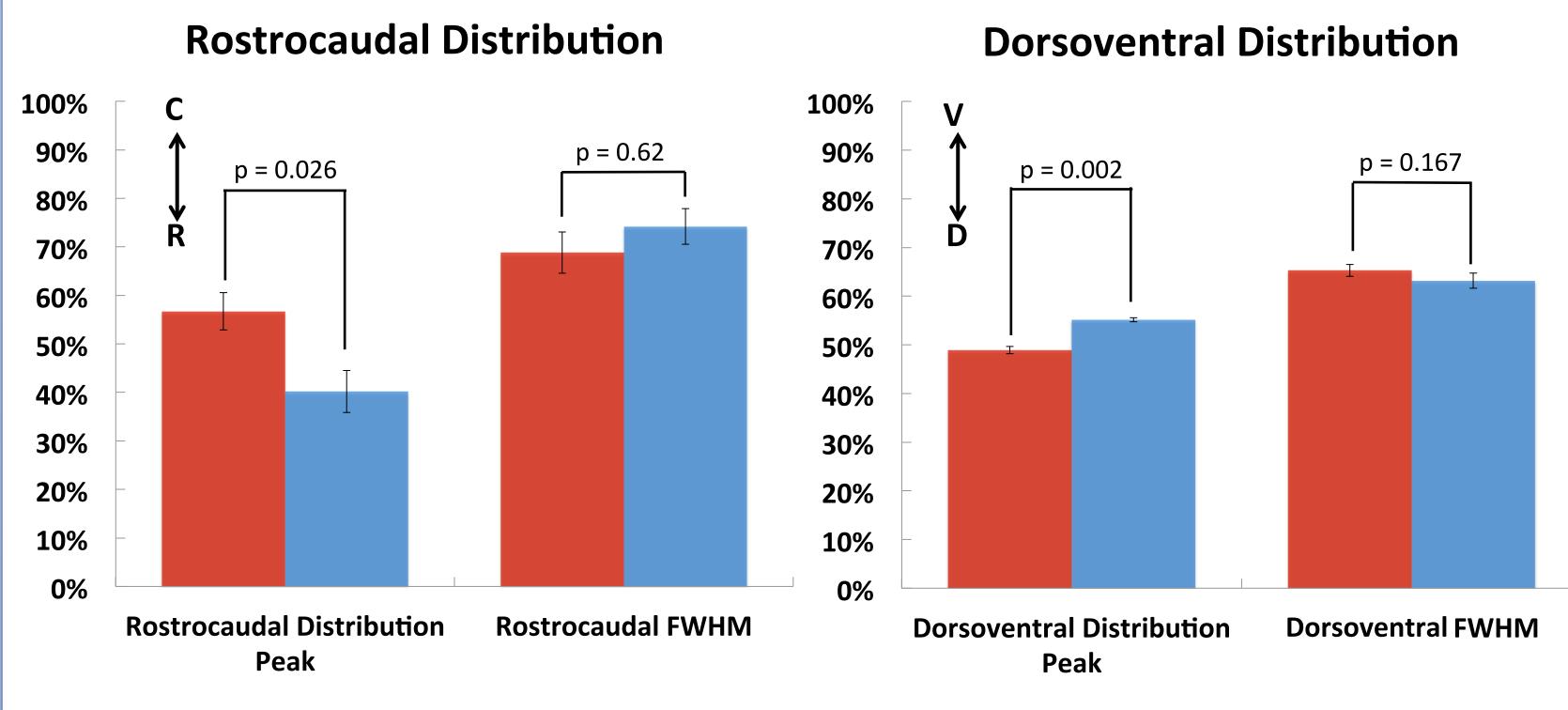


A. Retrogradely labeled with fluorogold layer 5 and 6 neurons, parvalbumin (PV) immunostaining and overlay. B. SMI32 immunostaining of a section with retrograde label. C. Injection site into the left inferior colliculus. **D.** Layer 5 cells reconstructed in Neurolucida. **E.** Layer 6 cells reconstructed in Neurolucida. F. Layer 5 heat map. G. Layer 6 heat map. H. Difference between layer 6 and 5.

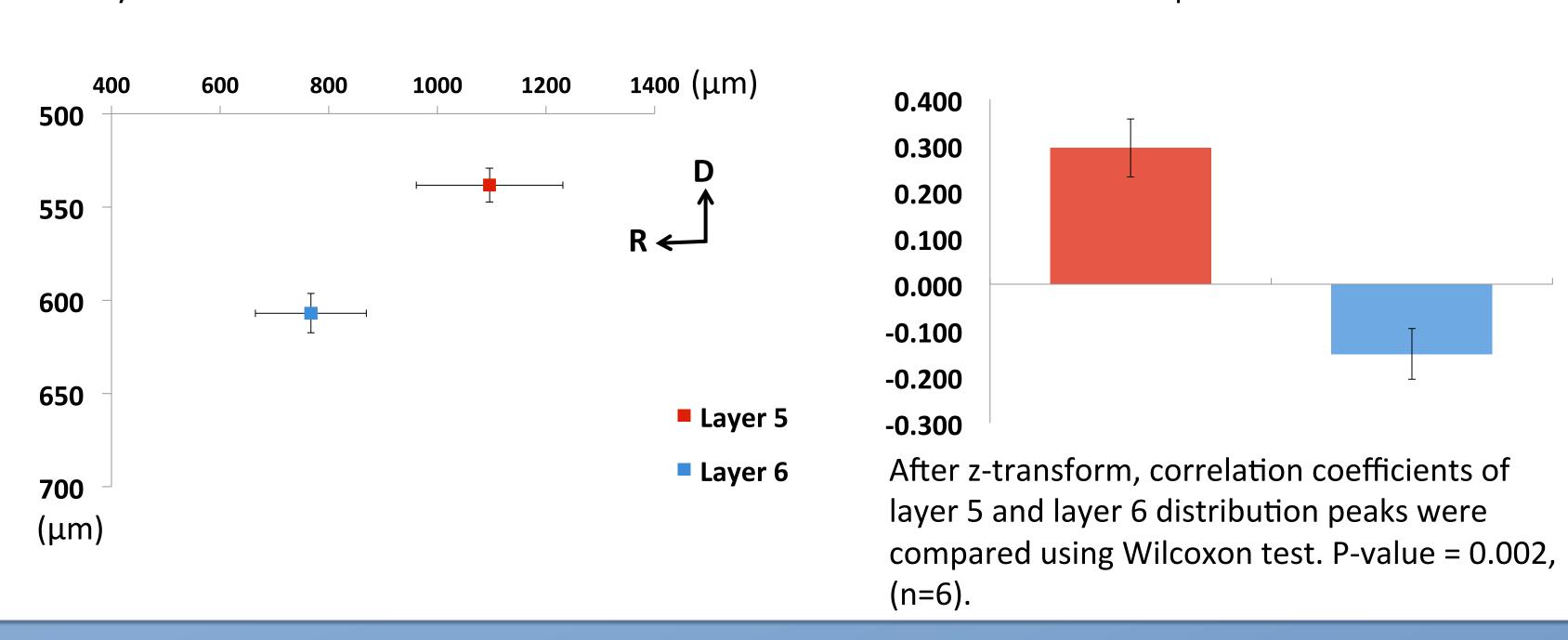
Compiled Retrograde Study Data



Retrograde Data Analysis



Wilcoxon non-parametric statistical test was used to analyze cellular distributions from layer 5 and layer 6. Number of animals n=6. The data were normalized and converted to percent.



Spatial Relationship Between Layers And Neural Response To Sound

Layer 5 Layer 6 PV/SMI

Layer 6 and layer 5 corticocollicular neurons generally aligned with flavoprotein autofluorescence map in response to broadband noise, but layer 6 neurons were located more ventrally and rostrally, and many were found outside of the acoustically-responsive

Conclusions

- The rostral and caudal borders of the auditory cortex are rich in layer 6 corticocollicular cells.
- These cells may be preferentially positioned to integrate information from somatosensory and visual cortical areas, and route this multisensory information back to the inferior colliculus.

