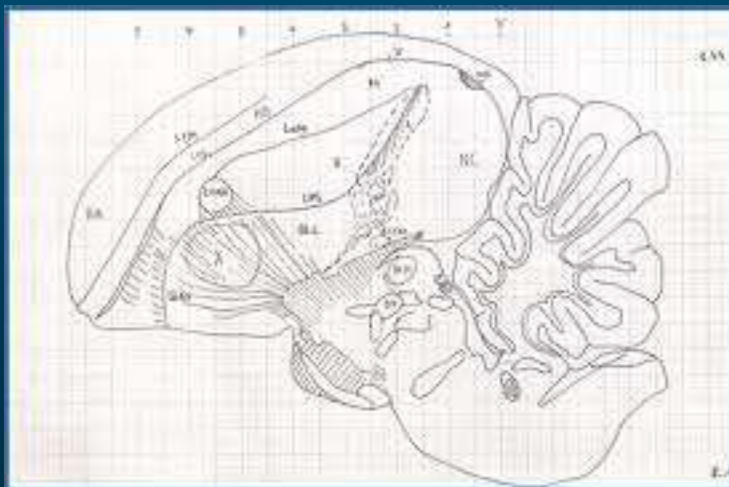




Linking Neuroanatomy to the Performance of Learned Behaviors: An Investigation of the Neural Basis of Disrupted Vocal Performance



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Zoology and Physiology
Honor's Program

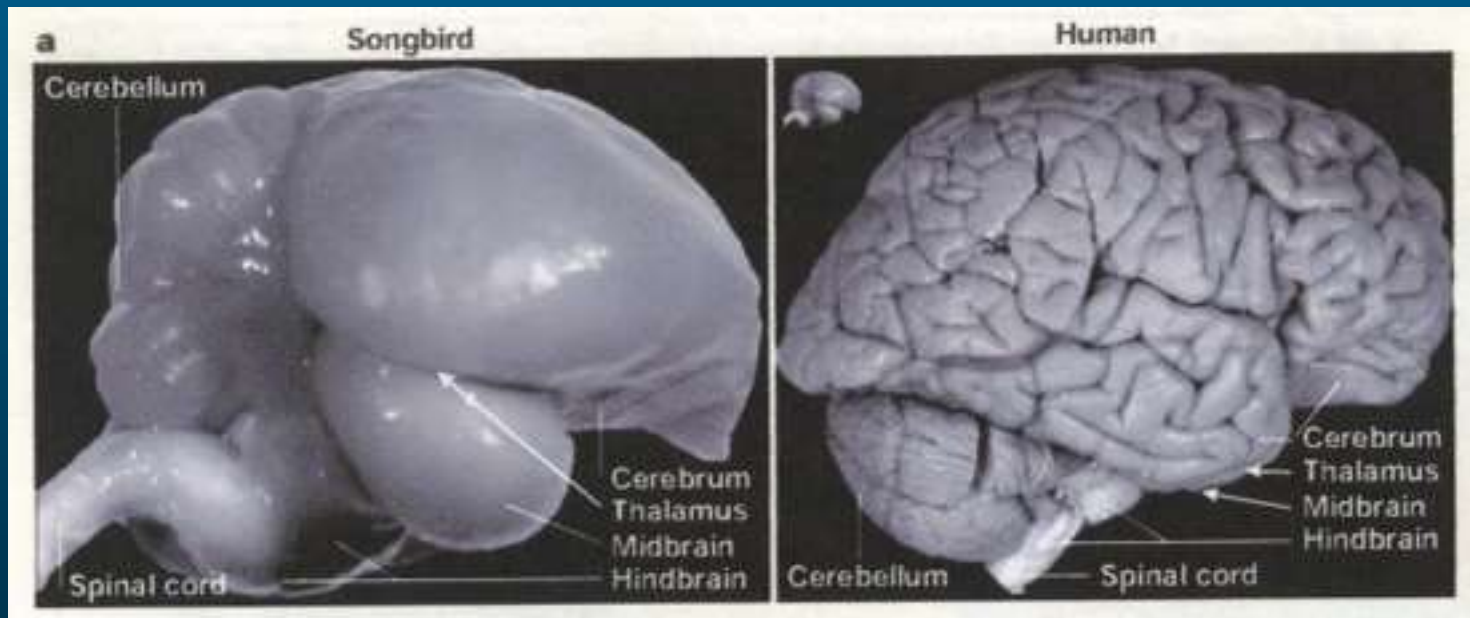
Overview



- Zebra Finch and the Song Circuit
- Preliminary Research
- My Research Goal – Histology/Microscopy
 - Cresyl Violet and DAPI
- Future goals, research, and application.
- Q&A

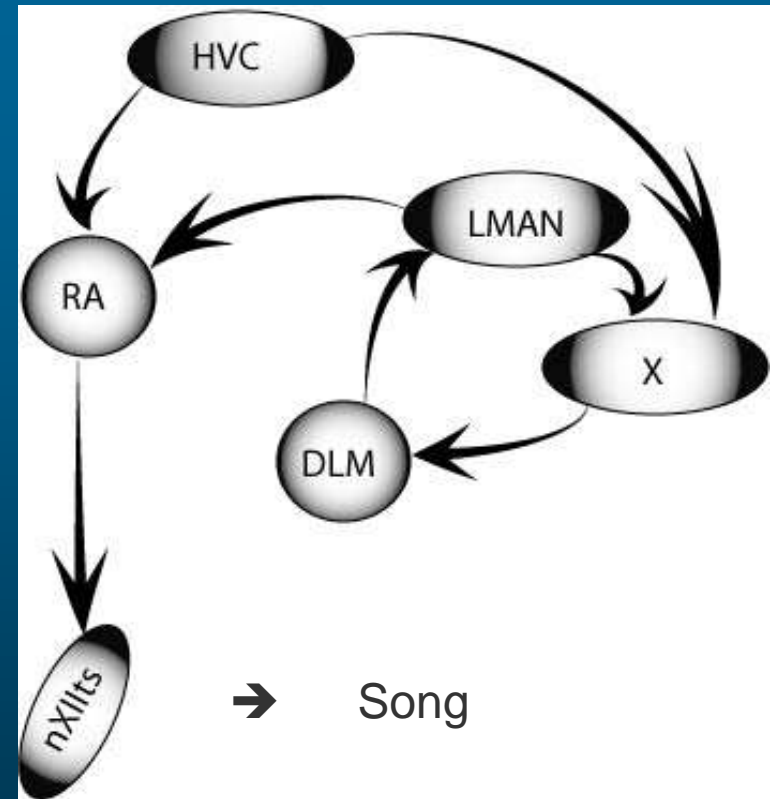
Introduction

- Specific brain sites and the animal model:
Why Zebra Finch?



Introduction Continued

- The Song Circuit
 - Song performance sequencing and timing
 - Sensory and motor pathways



Introduction Continued

- Preliminary Research: Disrupted Sequence
- Deslorelin: Drug Administration & Song
 - Lowered testosterone = disrupted sequence
 - What do we want to know?

Drug Administration



Hormone Change



Neuroanatomy



Behavioral Change

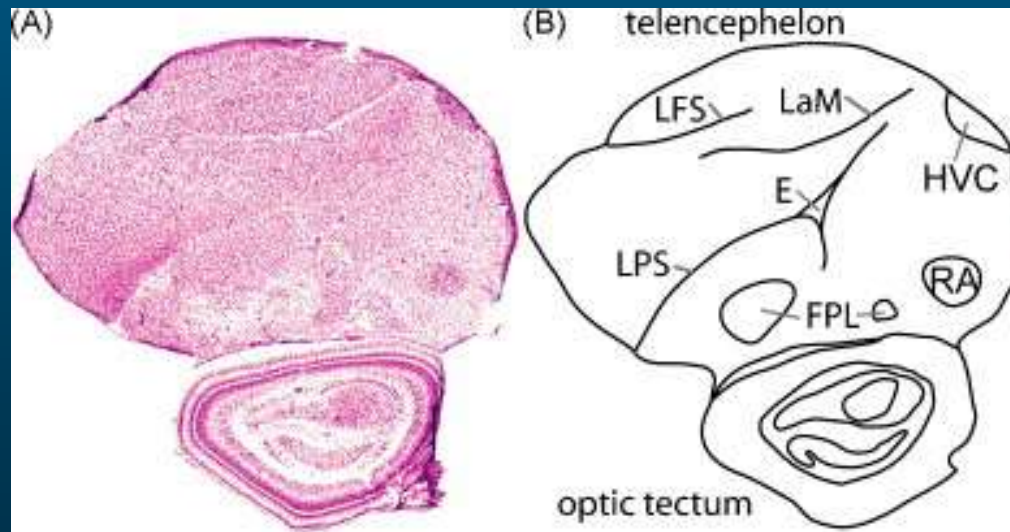


My Research

Are changes in behavior associated with changes in the brain?

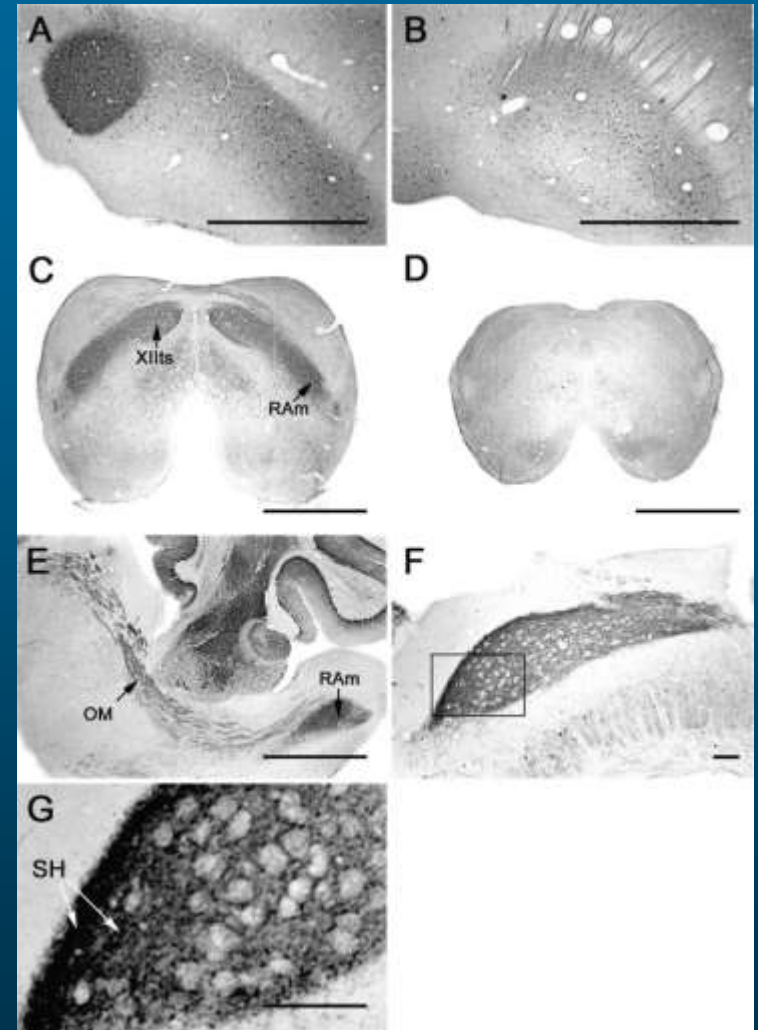
Histology & Microscopy

- Broad Approach
 - Know there is change, but where?
- Cresyl Violet
 - Nissl stain in neurons and cell nuclei



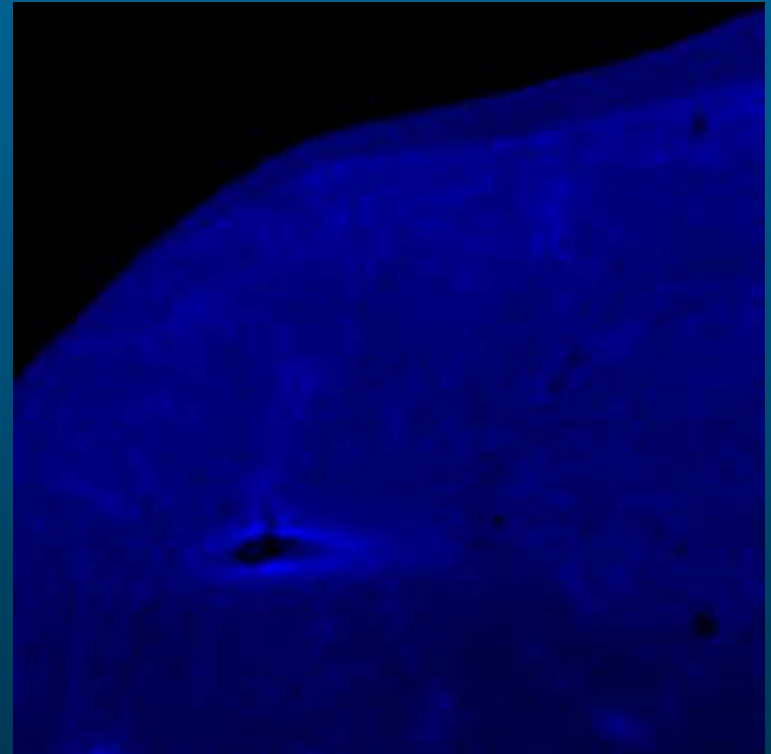
Histology & Microscopy

- Cresyl Violet
 - Values and Successes
 - Knowledge and Experience
 - Microscopy
 - Learn Neuroanatomical Features
 - Drawbacks
 - Shrinking, tearing, folding
 - Lack of consistent tissue preparation



Histology & Microscopy

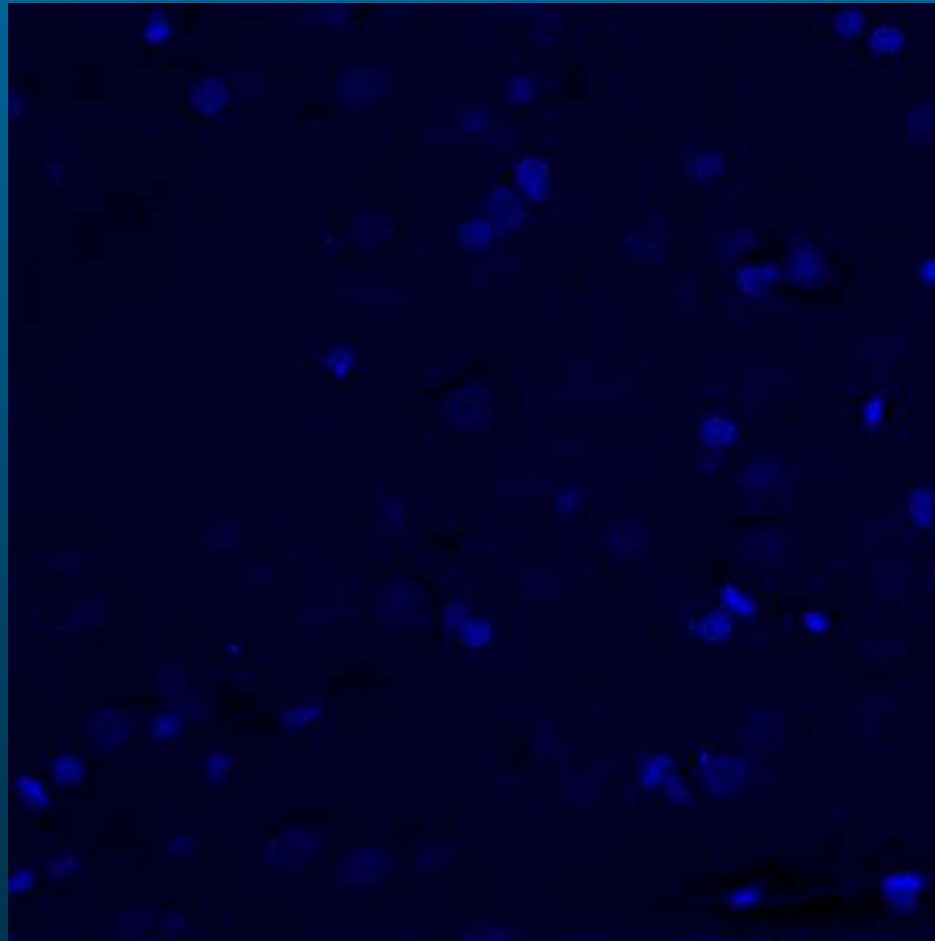
- Nuclei Volume vs. Cell Count
- DAPI
 - Binds to genetic material (A-T rich DNA)
 - Uniform staining
 - Greater tissue preparation consistency



Nuclei HVC
5x

Histology & Microscopy

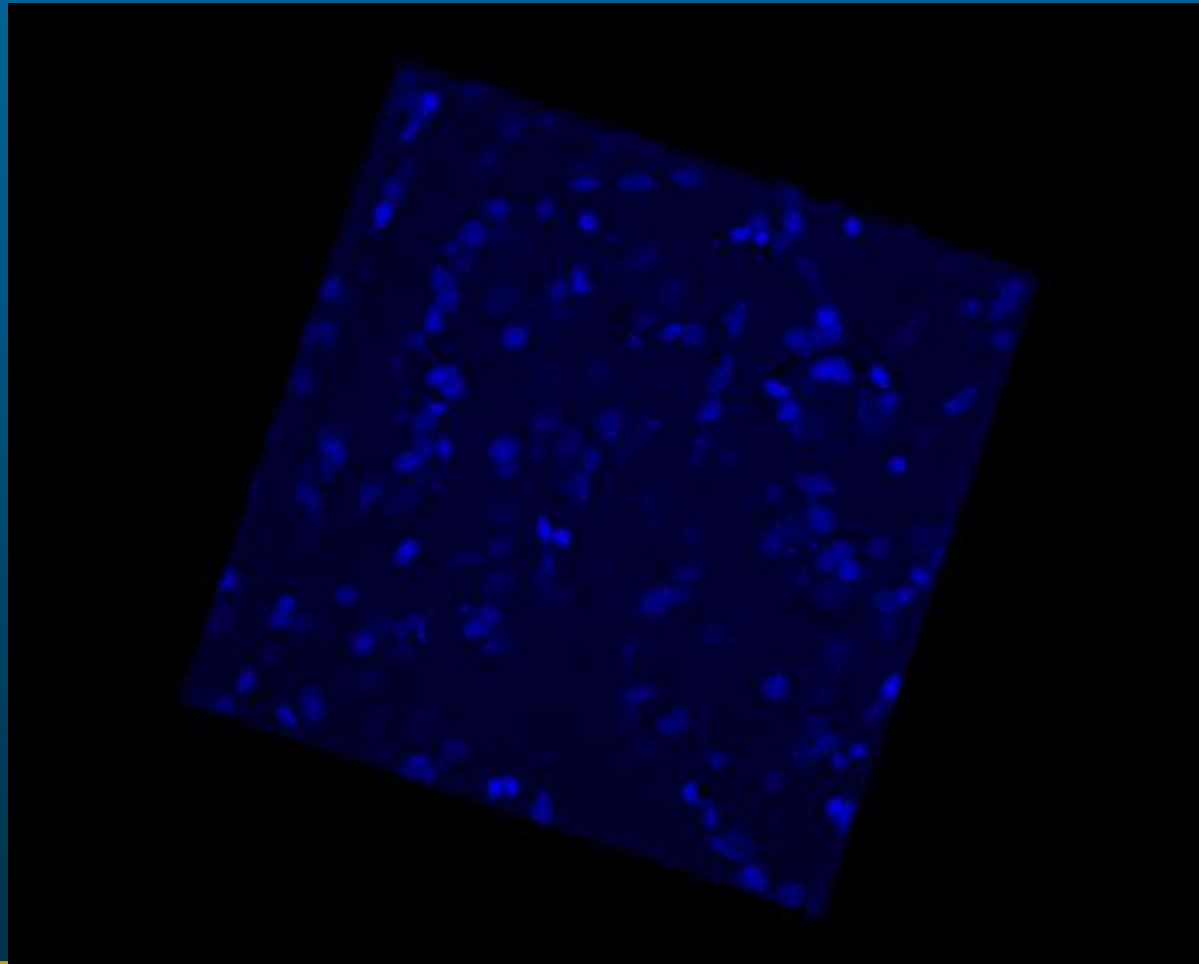
- Fluorescence continued...



Nuclei RA, 40x

Histology & Microscopy

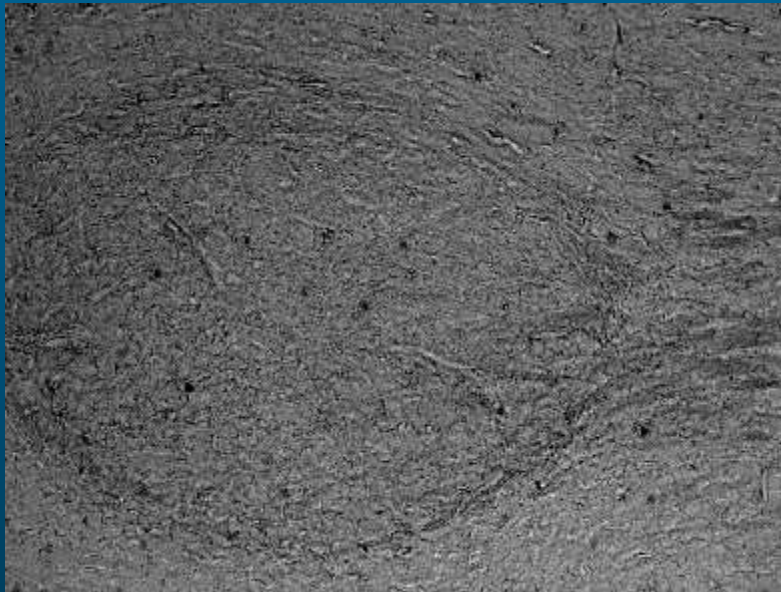
- Fluorescence continued...



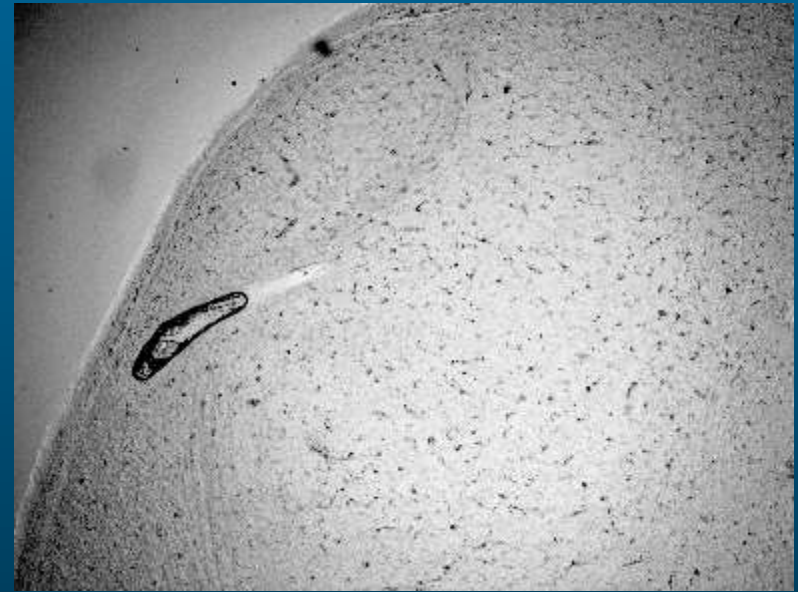
Z-Stack Image, Nuclei RA

Results

- Cresyl Violet & DAPI
- Possibility of site specific no-change



Nuclei RA

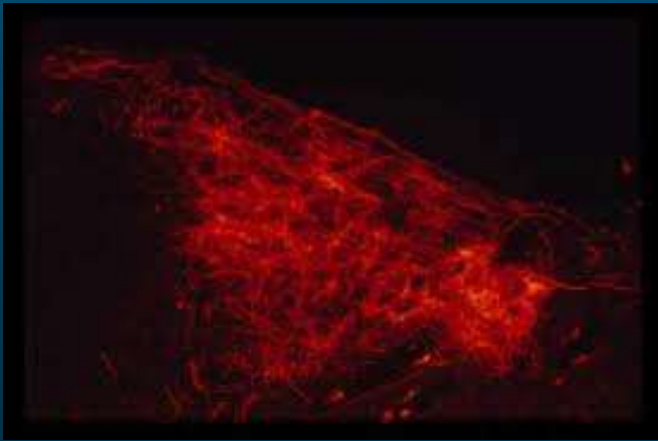
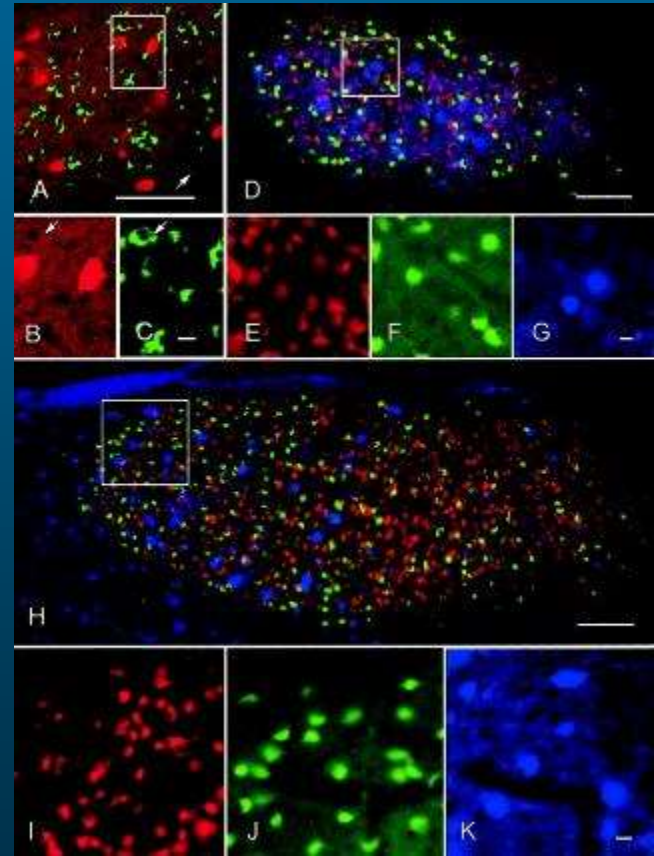


Nuclei HVC

Do these sites change?

Future Research

- Expansion of Song System Search
 - Potential for Vasculature
- Electrophysiology
 - Fluoro-Ruby & Fluoro-Gold



Conclusions

- Preliminary Research
 - My Research Goal
 - Cresyl Violet – nissl stain
 - DAPI – fluorescent genetic marker
 - Future Research
-

Questions?

Wild Zebra Finch



Resources

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