



Effect of Gut Microbiota on the Regeneration of the Enteric Nervous System

Sonya J. Malavez-Cajigas, Julio M. Cuevas-Cruz, Paola I. Rodríguez-Sánchez, Lymarie Díaz-Díaz, Omar Delannoy-Bruno, José E. García-Arrarás

University of Puerto Rico, Río Piedras Campus
Department of Biology

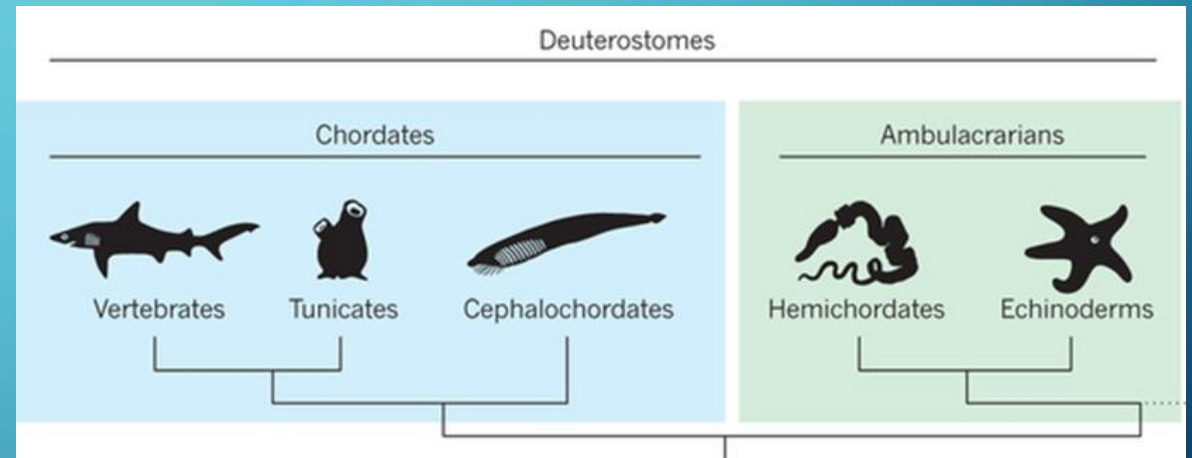
Intestinal microbiota

- Symbiosis
- Modulation of energy metabolism
- Immune system

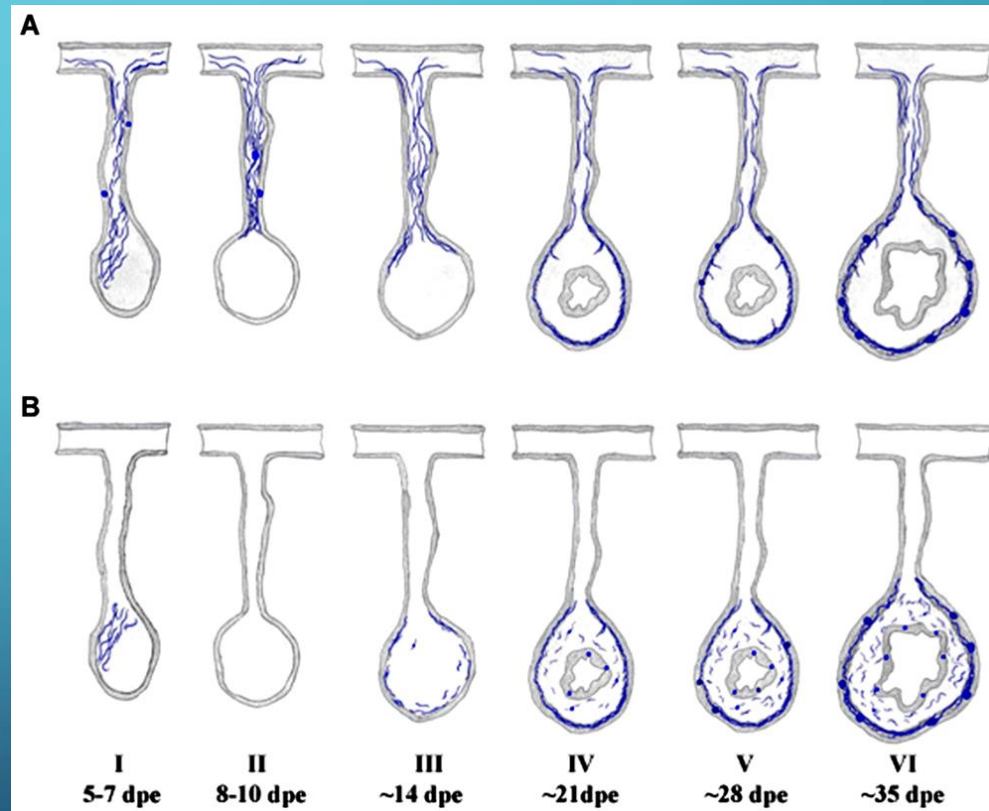
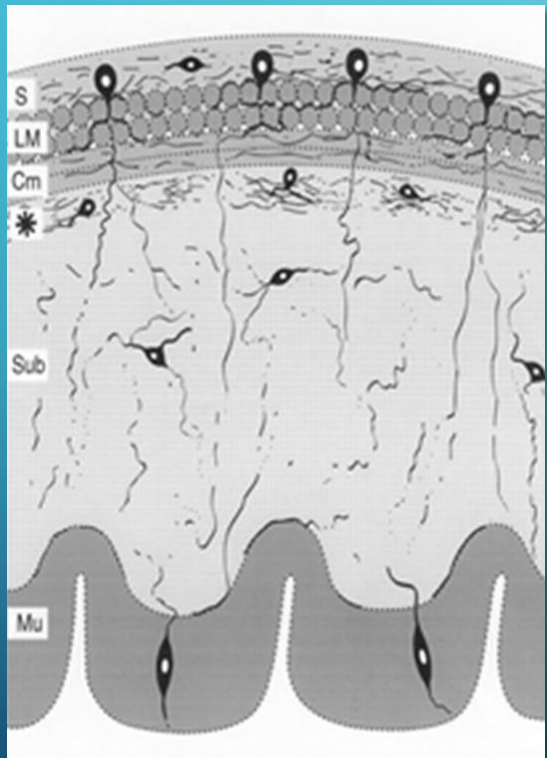


Sea cucumber *Holothuria glaberrima*

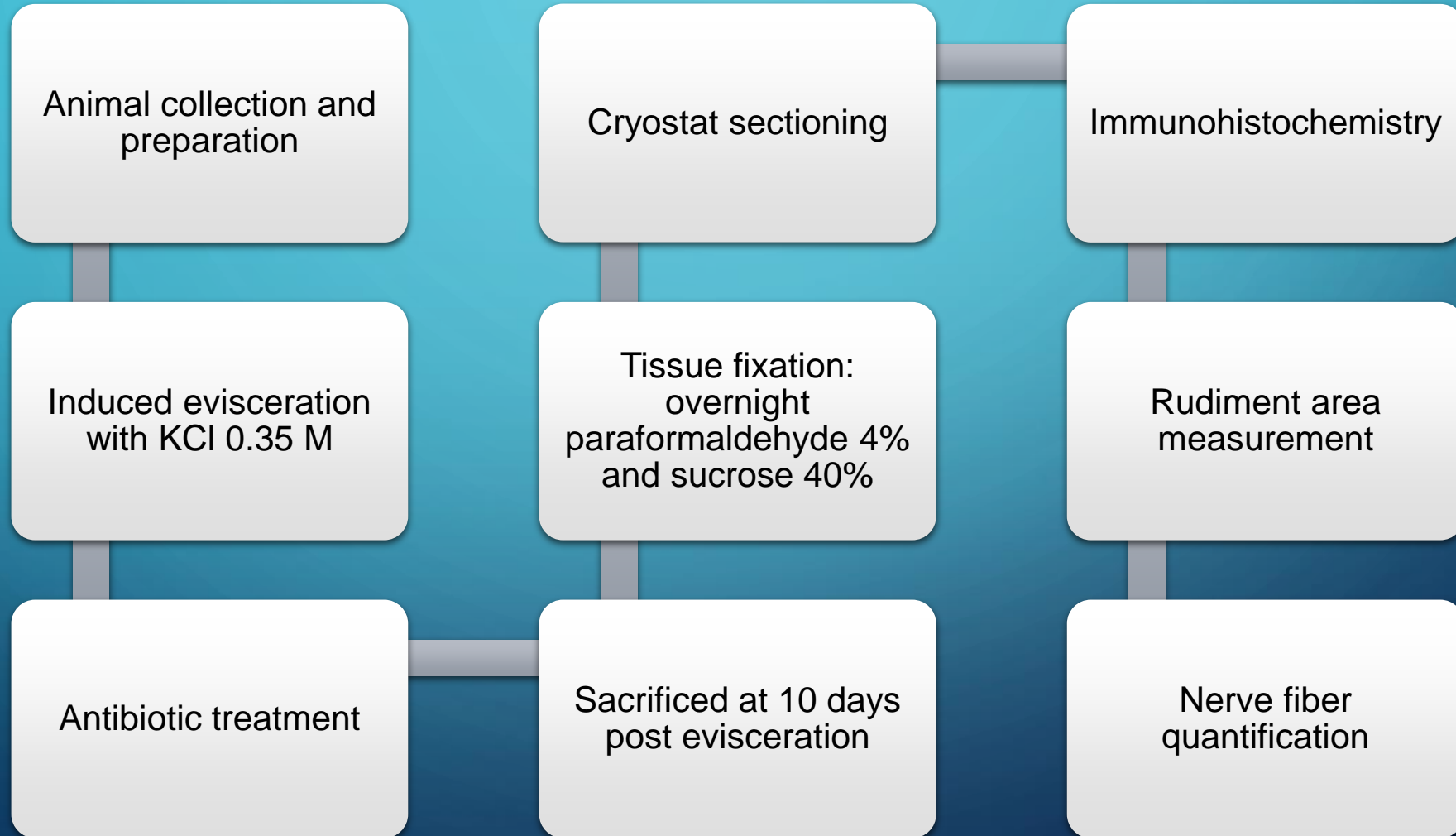
- Deuterostomes
- Echinoderms
- Regenerative capabilities



Enteric Nervous System



Methods



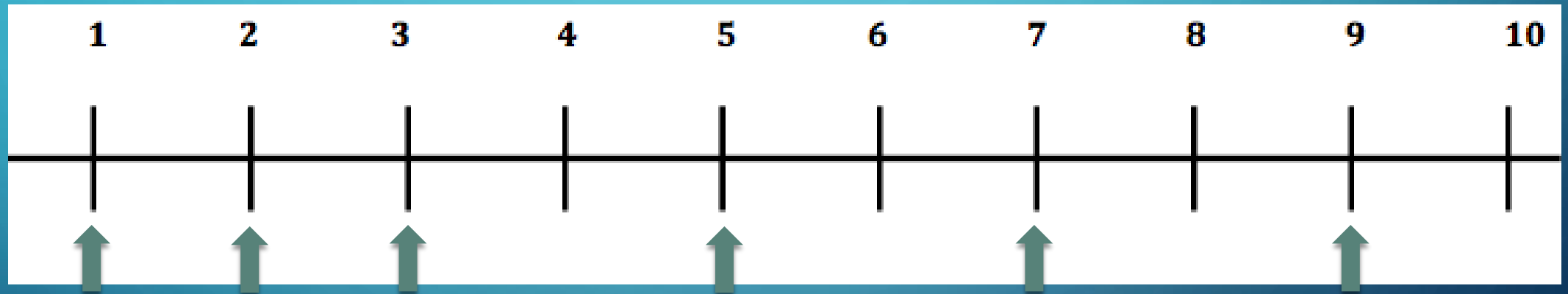
Methods

Antibiotic Treatment

Control Group (Artificial Seawater)	Penicillin/Streptomycin and Kanamycin	Penicillin/Streptomycin and Erythromycin	Penicillin/Streptomycin and Neomycin	Penicillin/Streptomycin
1L Water	1L Water 100µg/mL Pen/Strep 100µg/ml Kanamycin	1L Water 100µg/mL Pen/Strep 20µg/mL Erythromycin	1L Water 100µg/mL Pen/Strep 100µg/mL Neomycin	1L Water 100µg/mL Pen/Strep

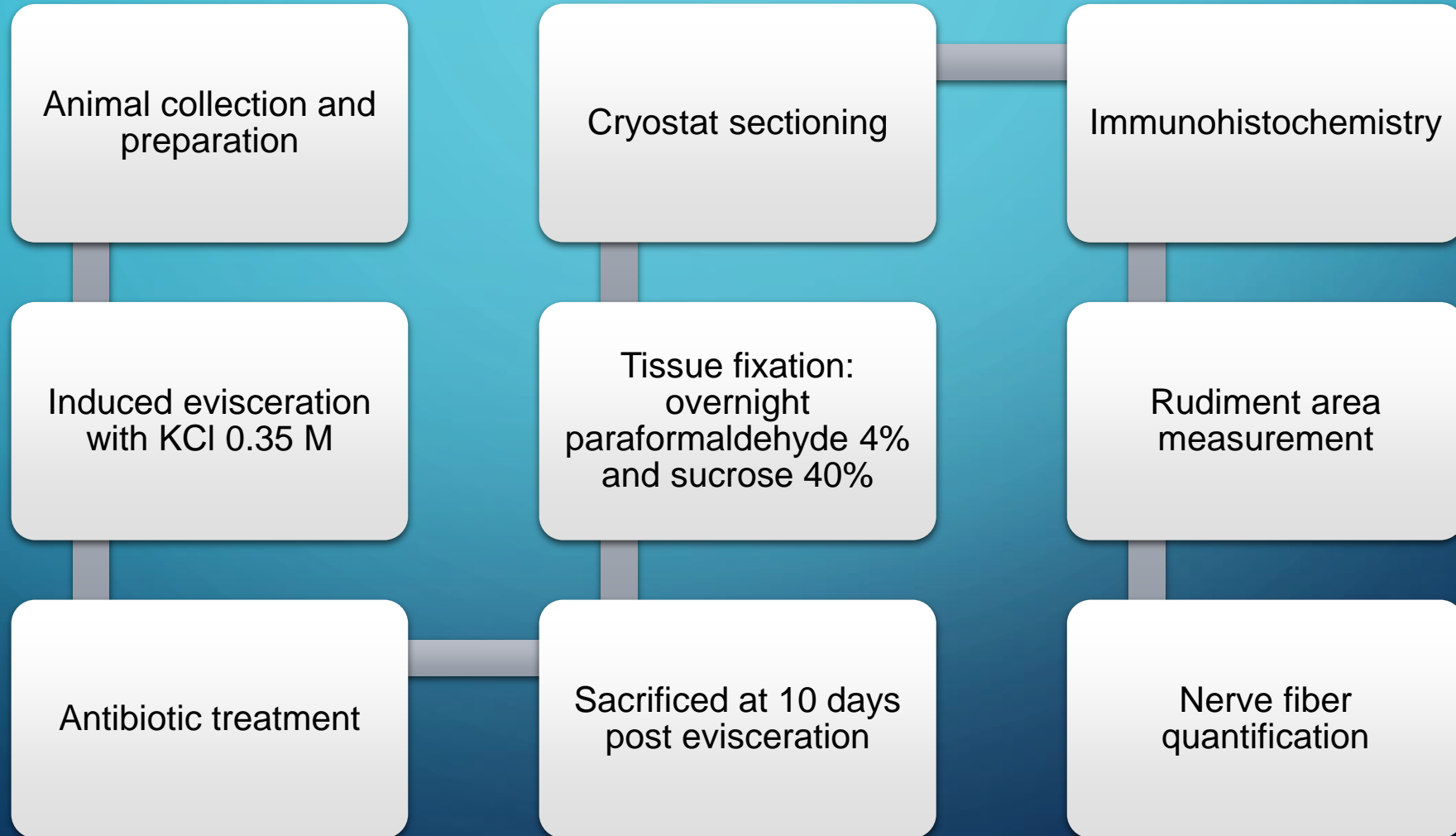
Methods

Days Post-Evisceration

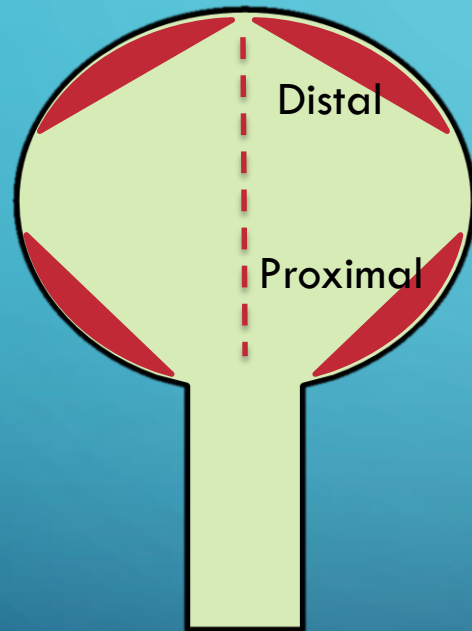


Change of Medium

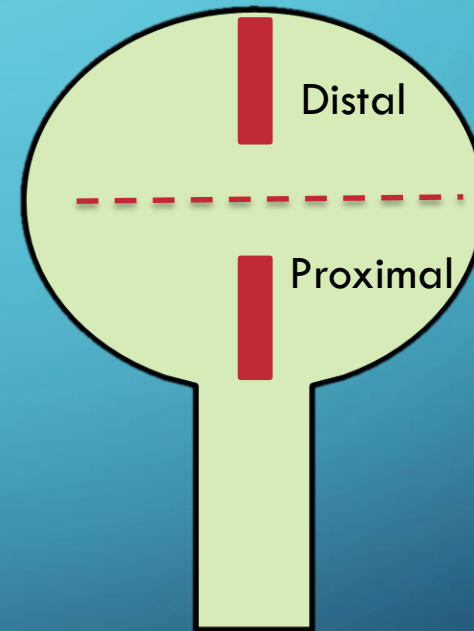
Methods



Nerve fiber quantification

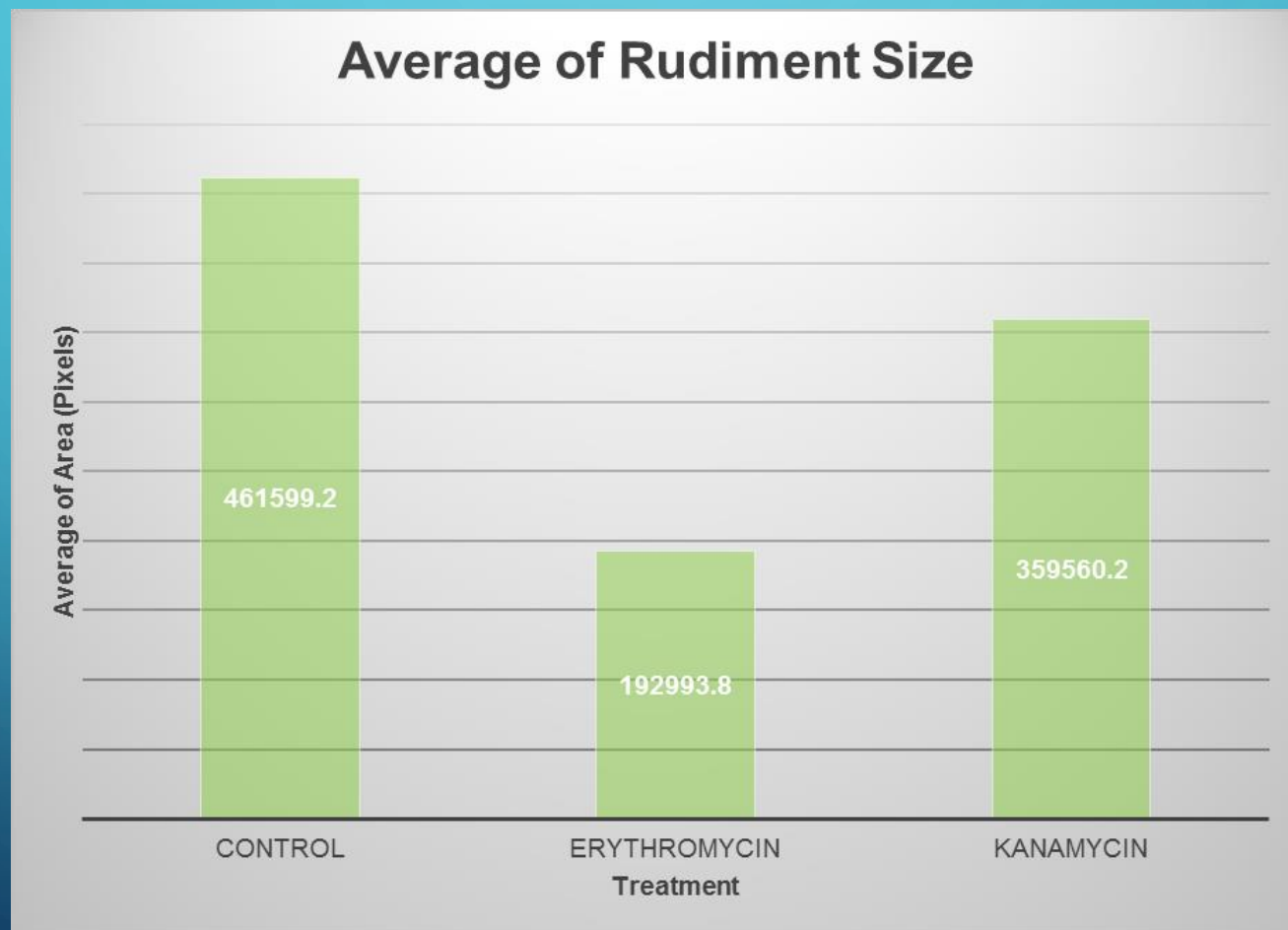


Mesothelium tissue



Connective tissue

Results

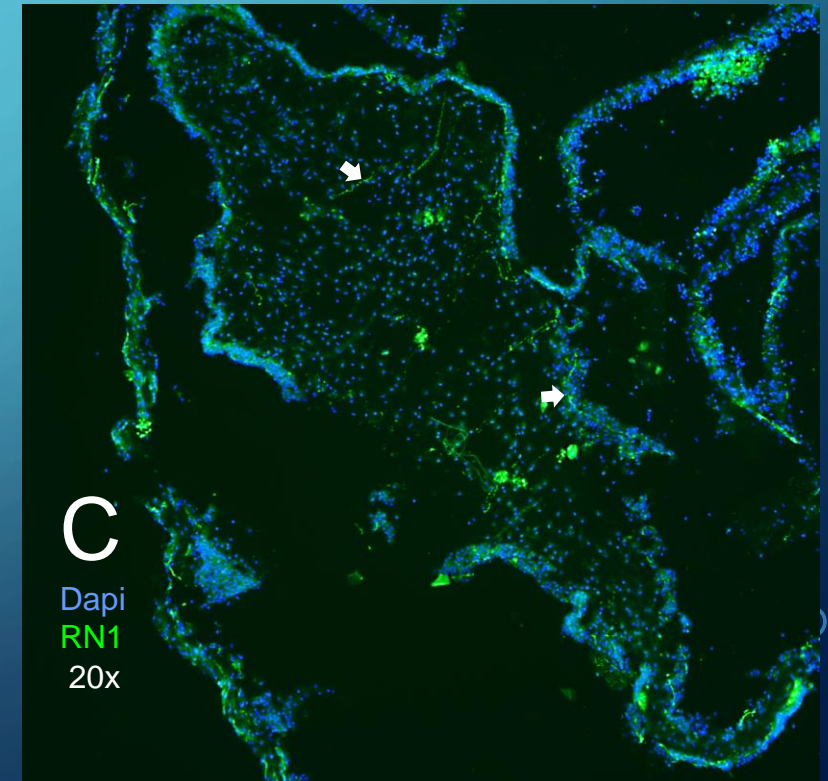
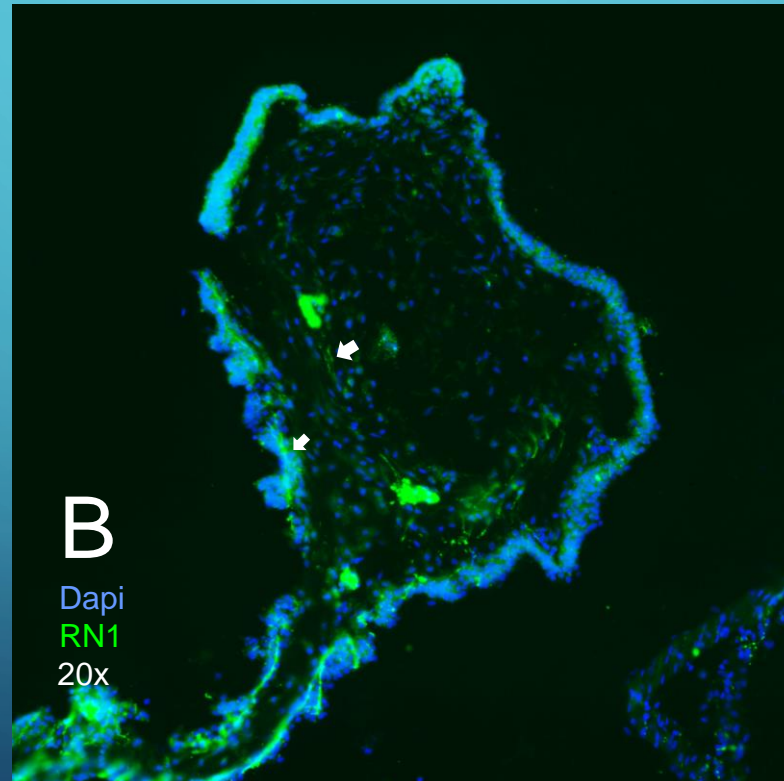
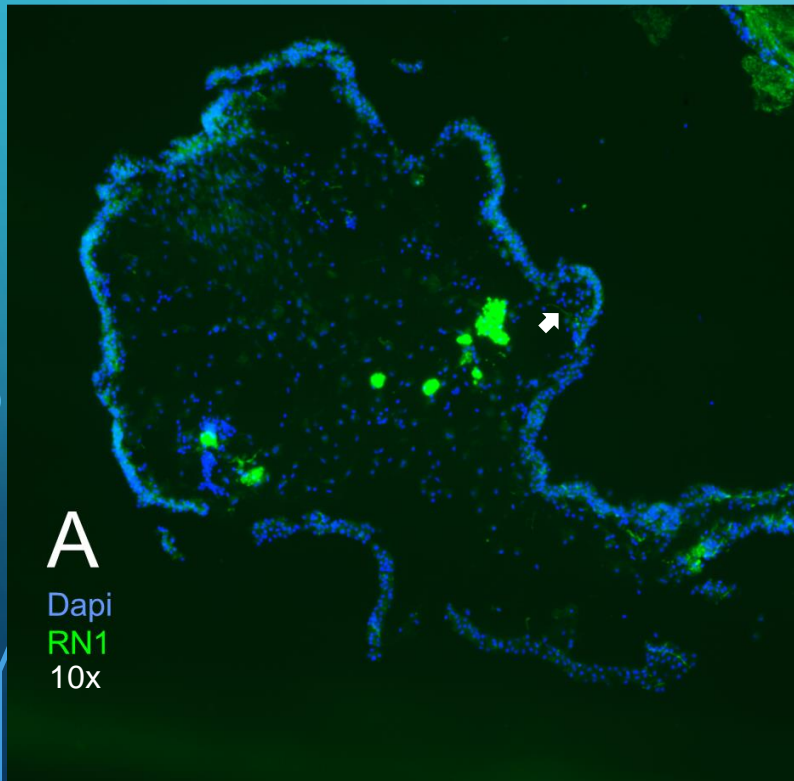


Immunohistochemistry

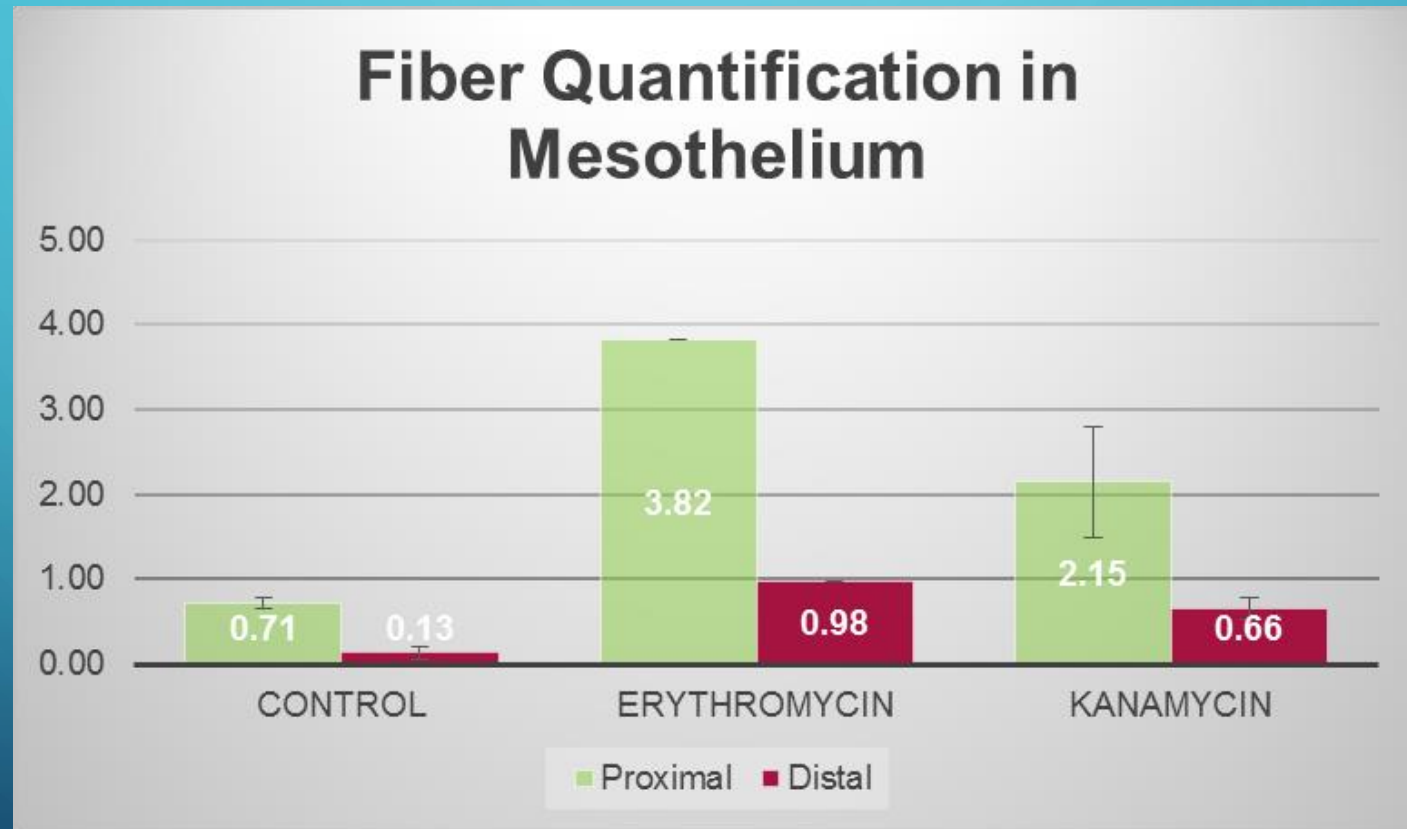
Control

Erythromycin

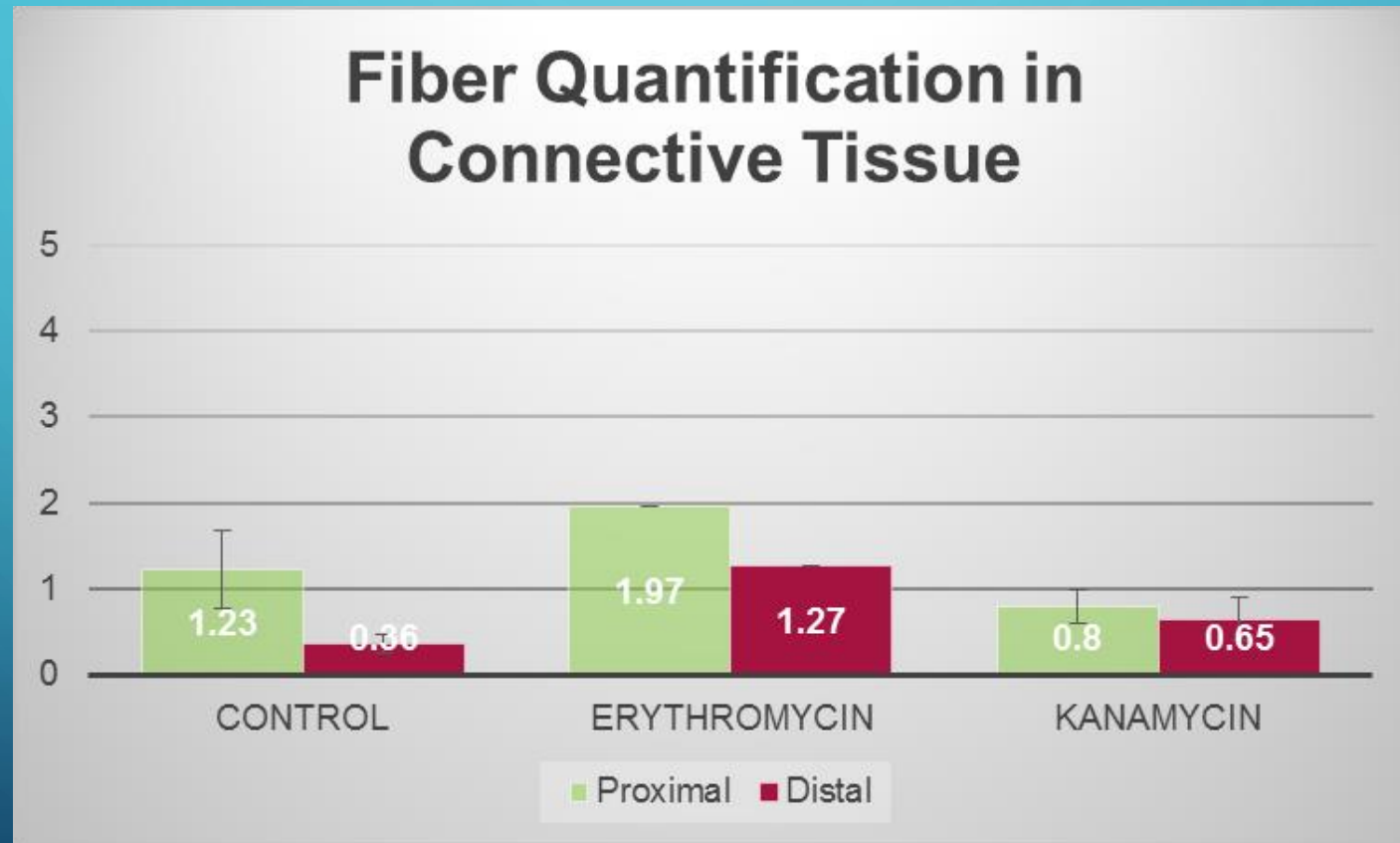
Kanamycin



Results



Results

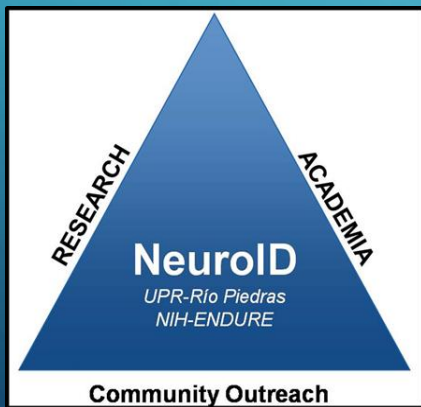


Conclusion

- Smaller rudiments were observed in animals treated with Kanamycin/PenStrep or Erythromycin/PenStrep.
- Experimental groups have more fiber presence in mesothelium tissue is comparison to control.
- In contrast, there doesn't seem to be significant difference between the groups in fiber presence in the connective tissue.
- Preliminary results suggest that the presence of a normal microbiome might be important for regenerative processes to occur.

Acknowledgements

- Developmental Neurobiology Laboratory
- NIH-ENDURE NeuroID





Questions