



Effects of Cannabinoids on Murine Embryo Vasculature and Morphology

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Objective

Given the increasing prevalence of prenatal cannabinoid exposure and its potential association with developmental abnormalities. This project uses advanced imaging to analyze morphological and vascular changes in murine embryos.

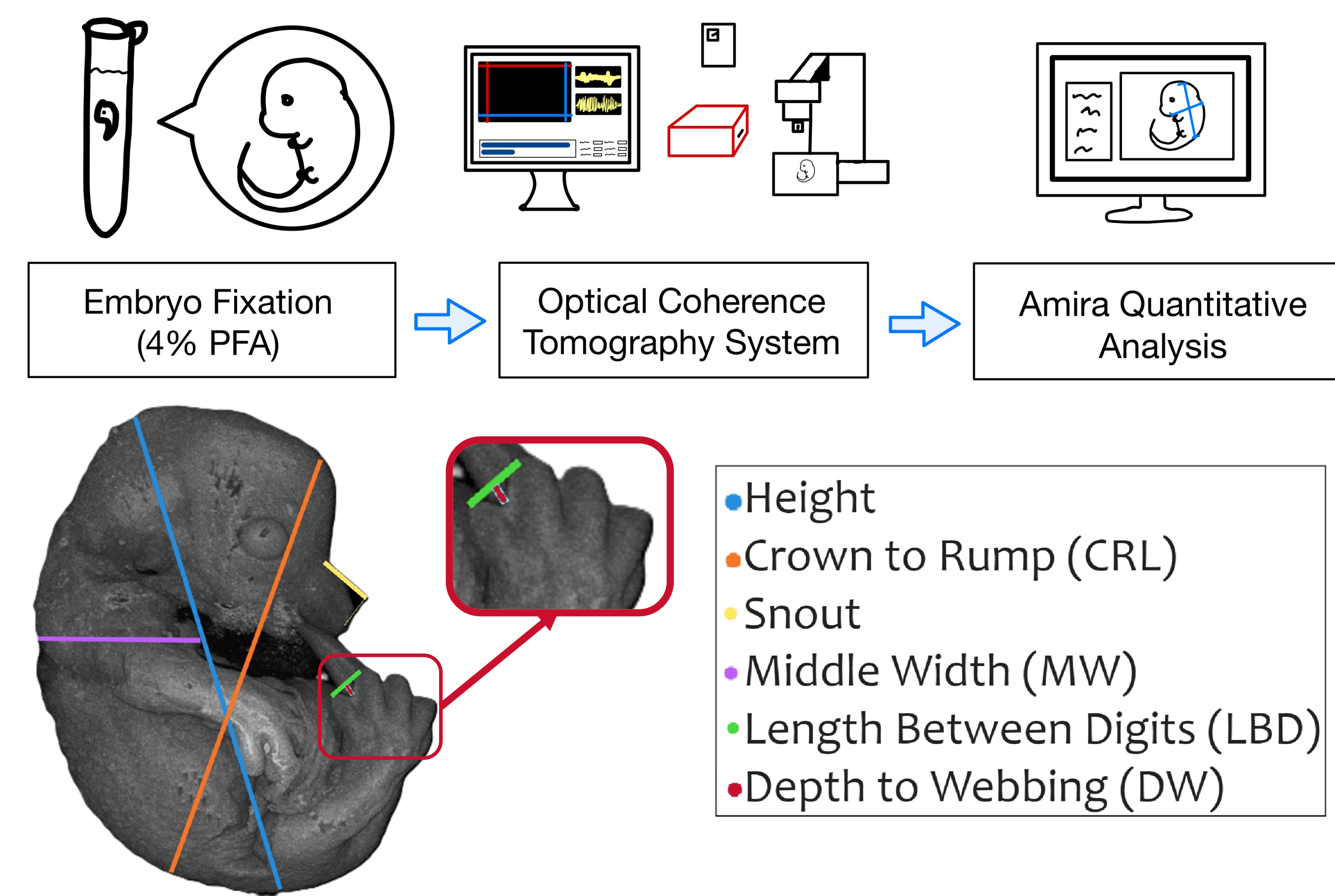
Background

Mice are a common model animal in developmental biology due to its significant similarity to humans [1]. Optical coherence tomography (OCT) is a high-resolution, label-free, 3D, noninvasive imaging modality that is commonly used in developmental biology [3]. Optical projection tomography (OPT) is another commonly utilized high-resolution, 3D, noninvasive imaging modality in developmental biology [3].

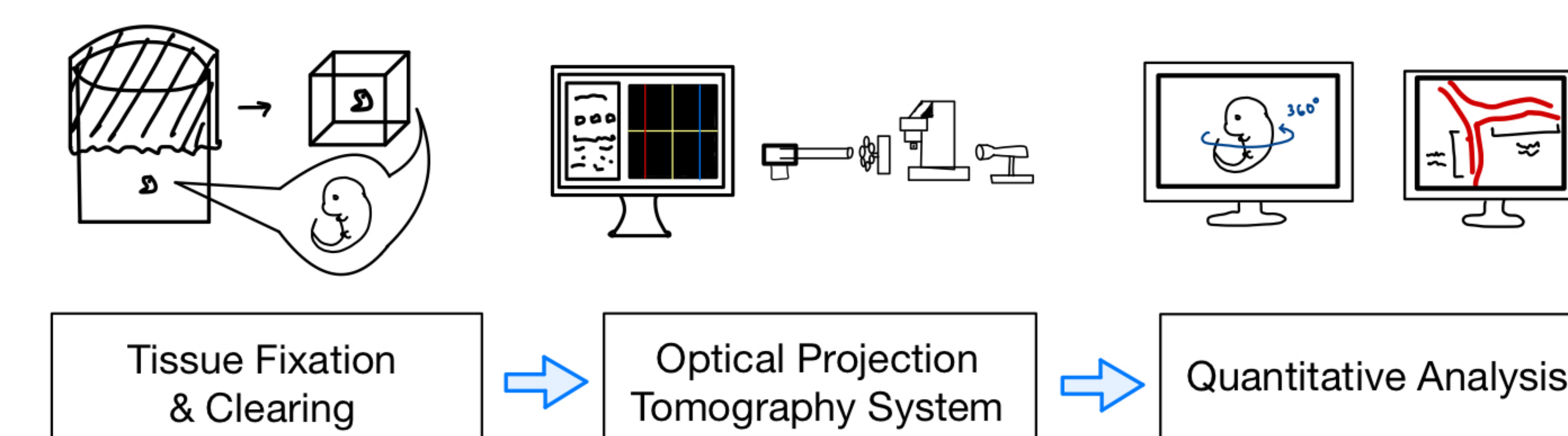
Methods

Pregnant mice are dosed with either 0.0625 mg/kg, or 0.25 mg/kg at gestational day 14.5, and compared with the control group. Embryos were extracted and placed into paraformaldehyde (PFA), and divided into of two groups: (1) imaged with OCT or (2) cleared utilizing SCALE [4] to image with OPT.

Optical Coherence Tomography Imaging



Optical Projection Tomography Imaging



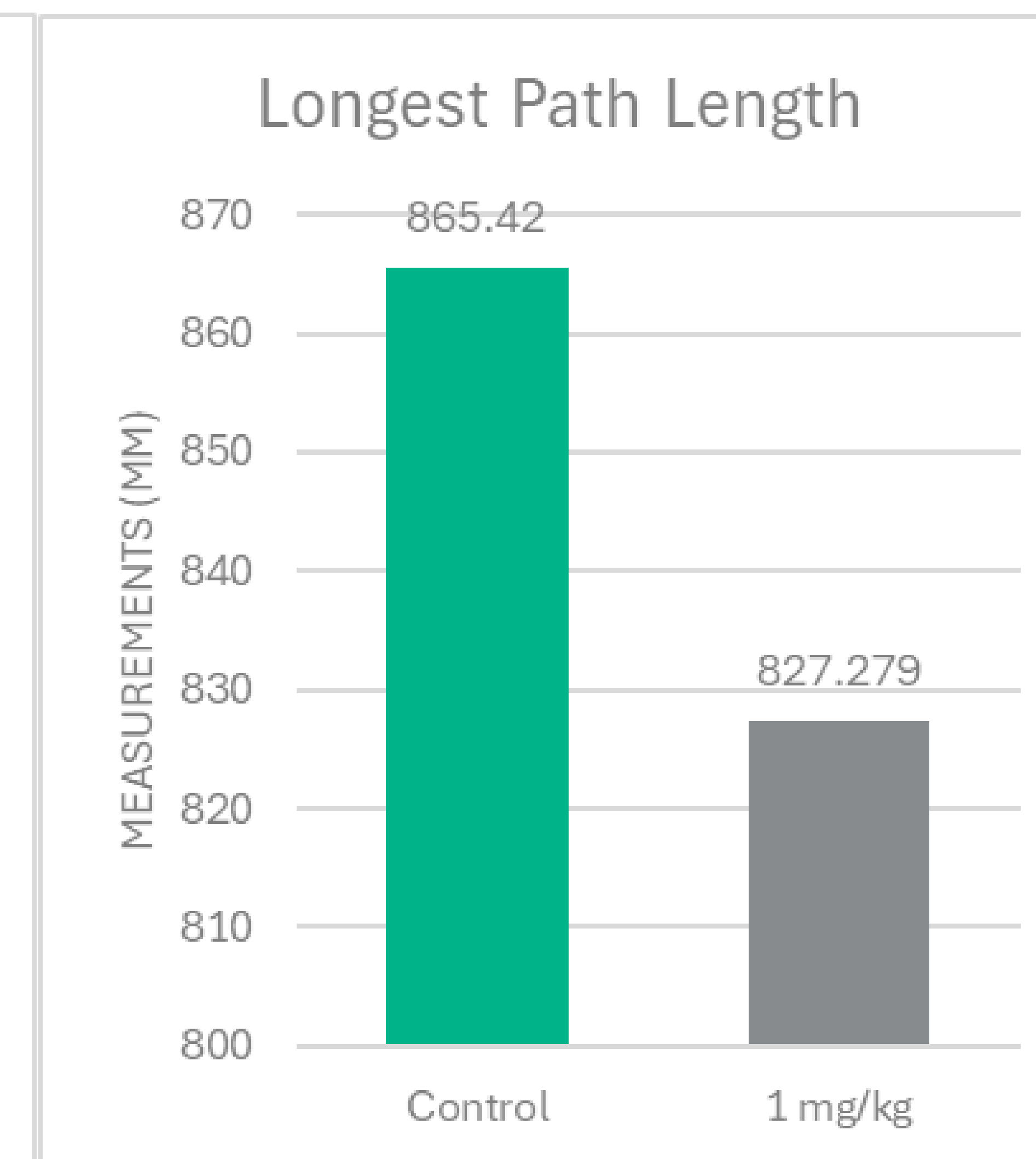
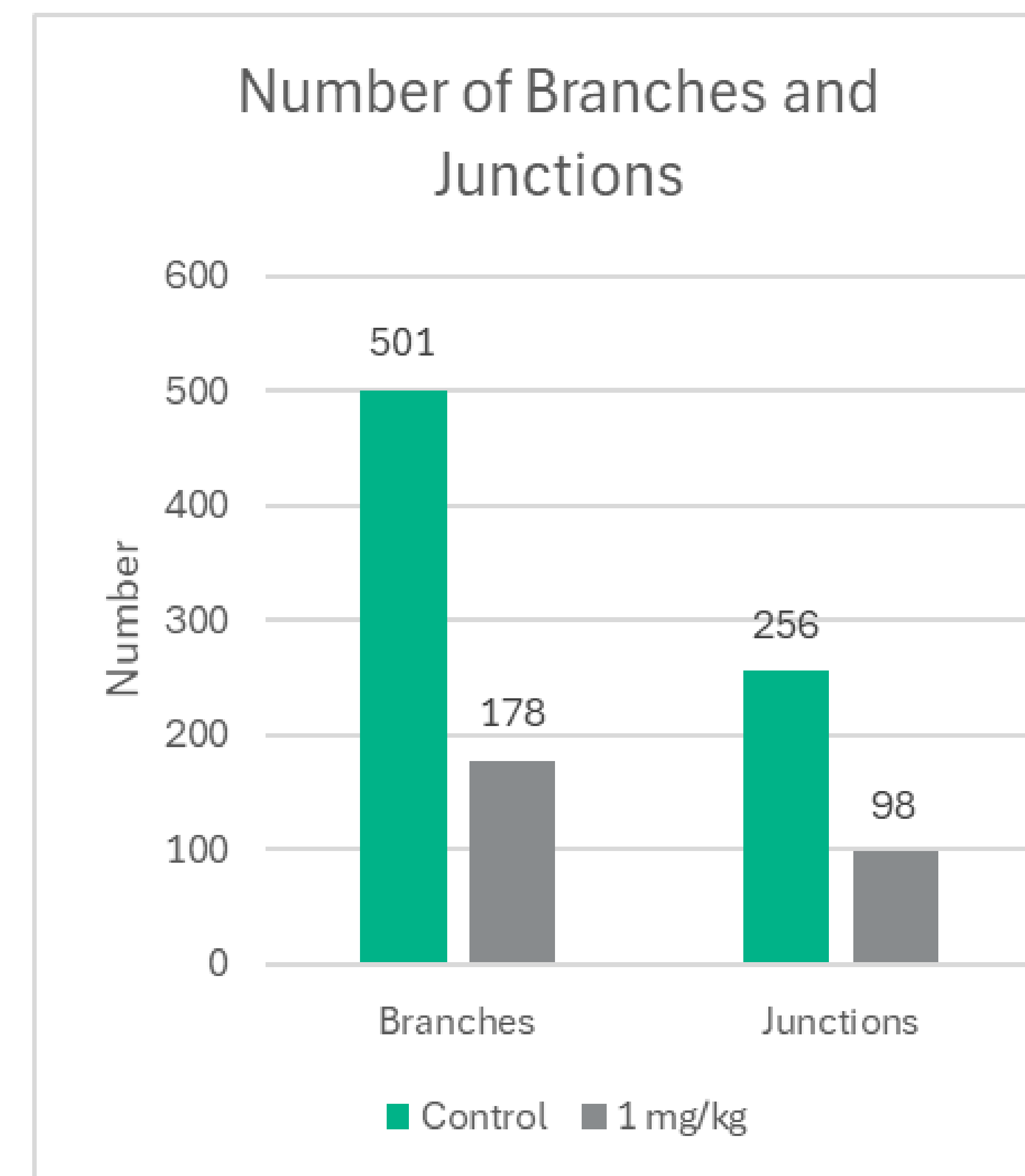
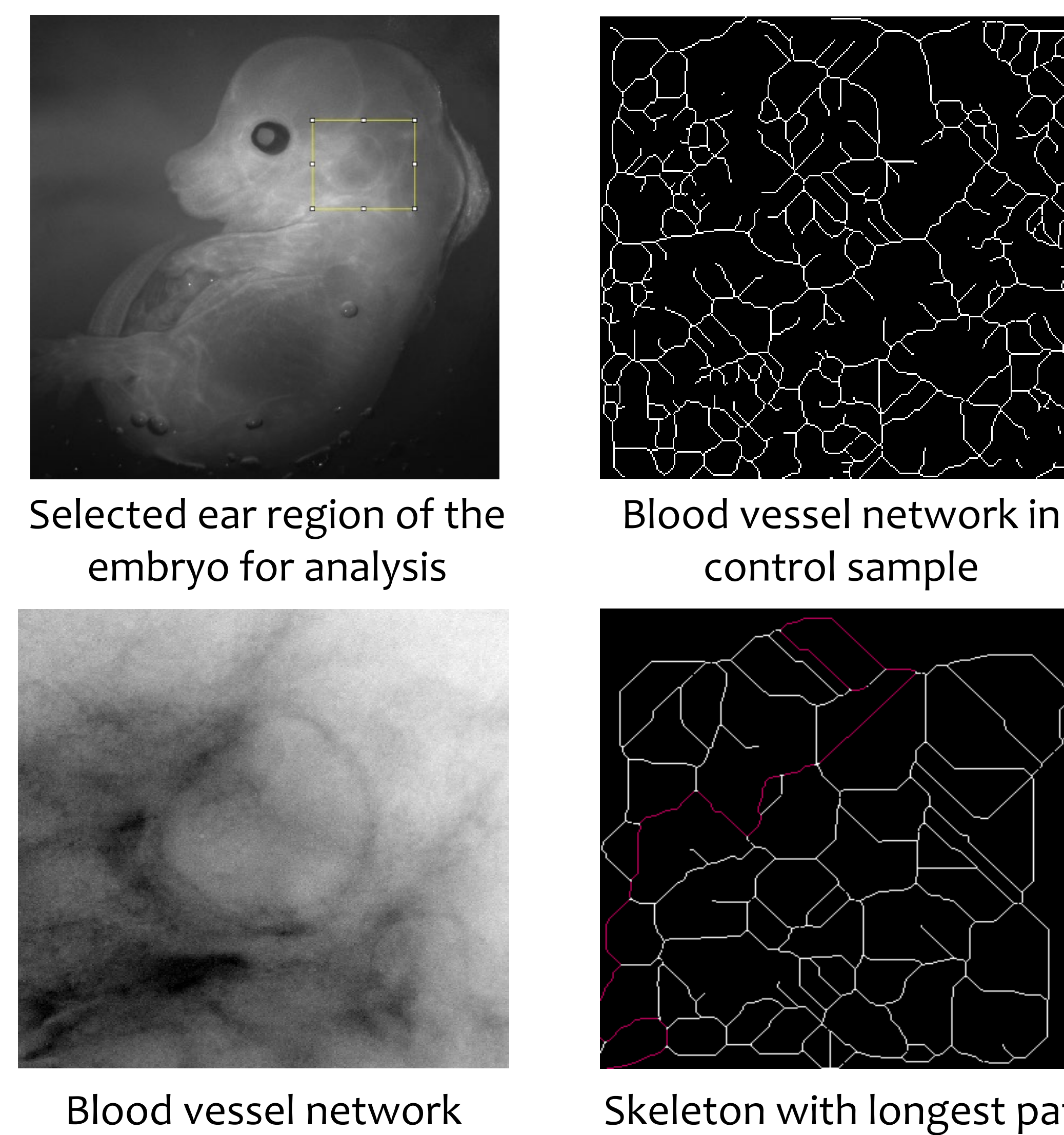
Optical Coherence Tomography Results



Measurement	Control	0.0625 mg/kg	0.25 mg/kg
Height (mm)	11.41 ± 1.05	11.08 ± 0.58	10.91 ± 0.95
CRL (mm)	10.84 ± 1.25	10.79 ± 0.77	10.08 ± 1.13
Snout (mm)	1.52 ± 0.21	1.29 ± 0.52	1.52 ± 0.37
MW (mm)	4.63 ± 0.71	4.68 ± 0.93	4.76 ± 0.71
LBD (mm)	0.81 ± 0.13	1.10 ± 0.15	1.02 ± 0.17
DW (mm)	0.51 ± 0.17	0.58 ± 0.21	0.43 ± 0.26

Increasing dosage leads to consistent reductions in embryo size, with decreased height and crown-rump length and less defined structural features, indicating impaired morphological development.

Optical Projection Tomography Results



Conclusion

Exposure to the synthetic cannabinoid CP 55,940 showed reduction in embryonic growth and morphological development in a dose dependent manner, with decreased crown rump length, reduced height, and altered structural measurements. Changes in vascular complexity are also observed and warrant further study.

Acknowledgements

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References

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