

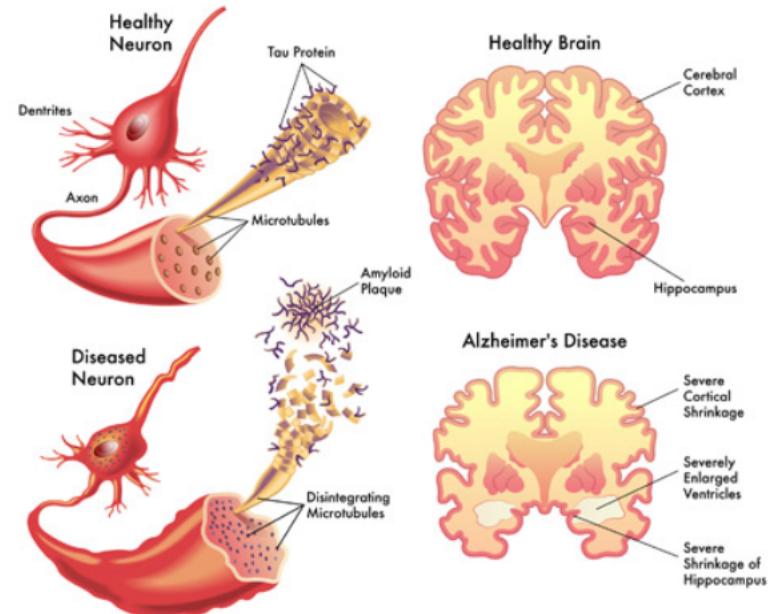
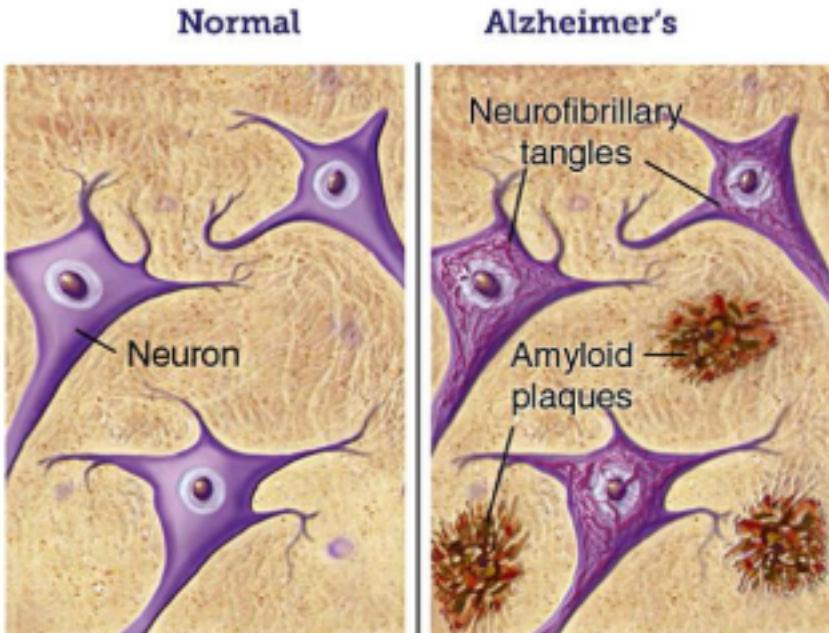
The Pathological Interaction Between Alzheimer's Disease and Osteoporosis in 5xFAD Mouse Model

Shruti Shakthivel, Dr. Ryan Ross PhD.

Alzheimer's Disease

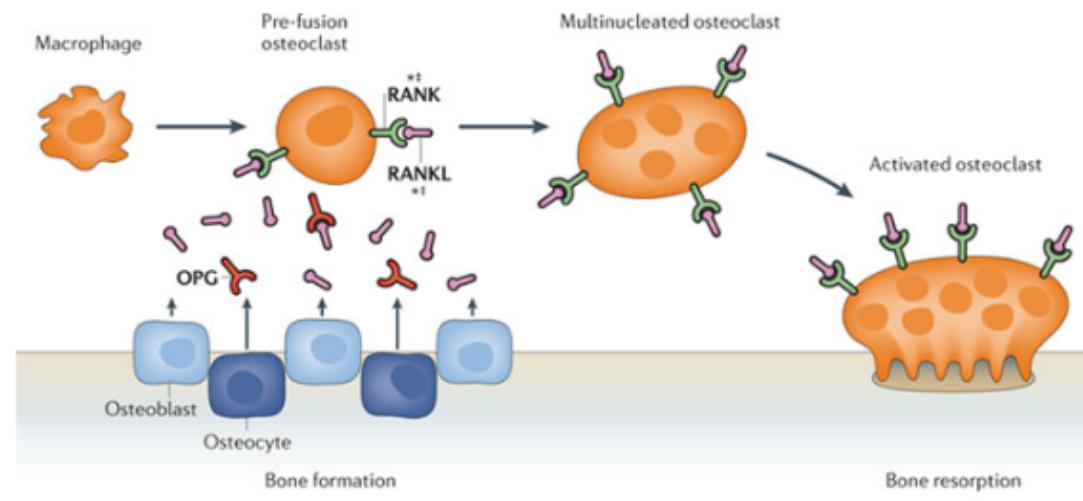
- Decreased Cognitive Function: Disconnected Neurons
- Amyloid Plaques: A β 40 and A β 42

Normal vs. Alzheimer's Diseased Brain



Osteoporosis

- Low Bone Density
- Osteoclasts

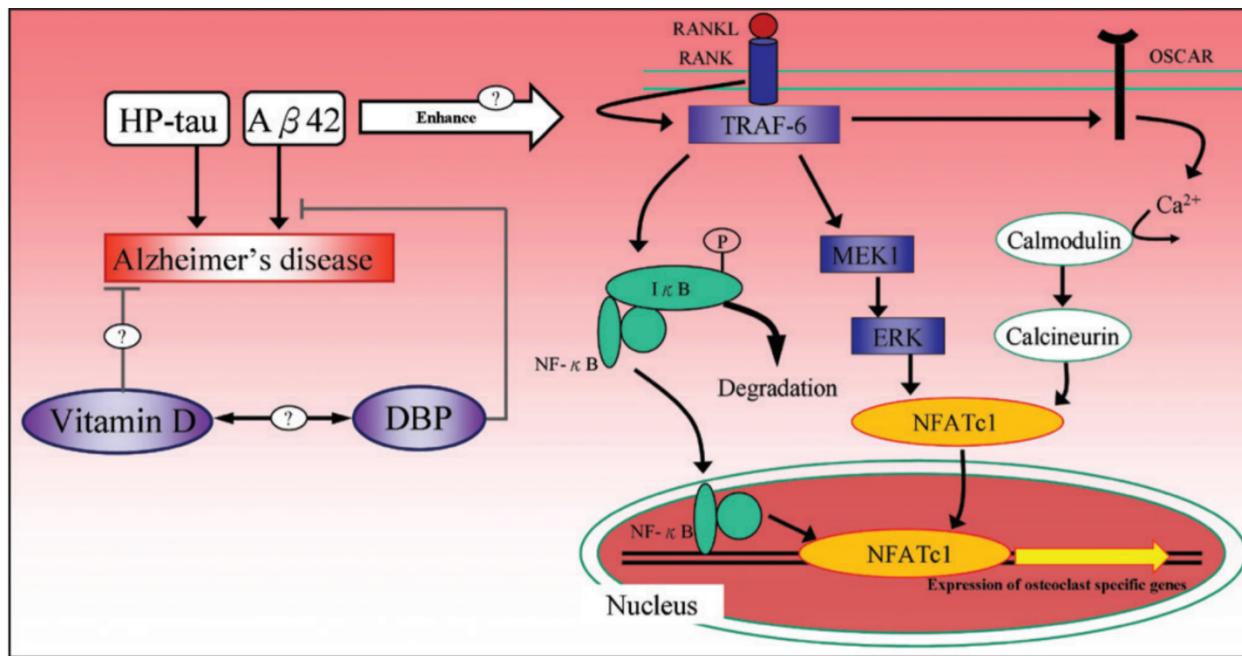


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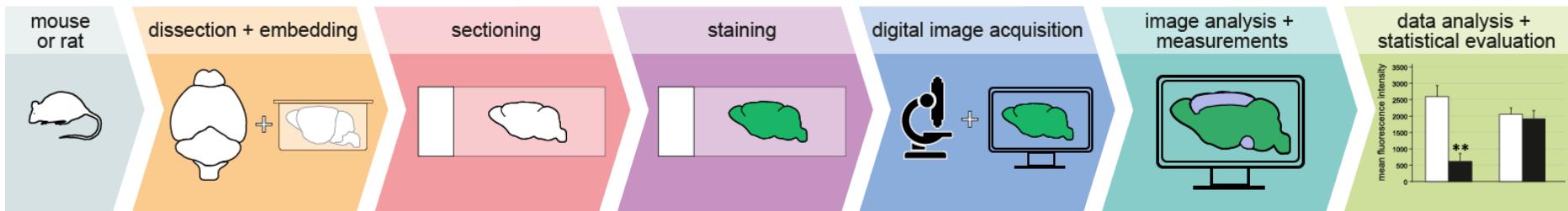
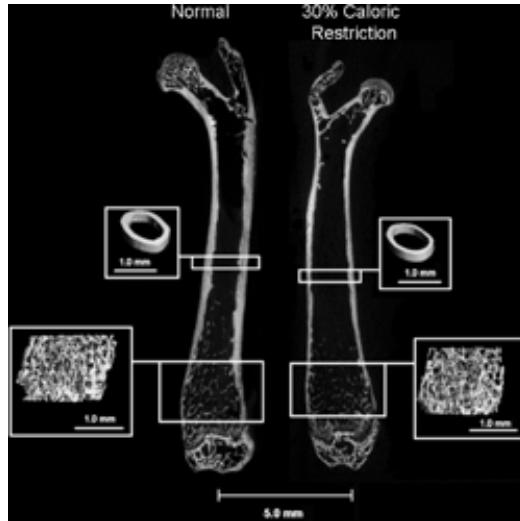
So What?

The Connection and My Project

- Previous Research
 - Alzheimer's Disease correlates with lower bone density.
 - Higher risk for hip fractures
 - Previous mouse model studies: APPswe, Tg2576, APPswe-OCN
- The 5xFAD Mice
 - Recapitulates the major features of the amyloid plaque pathway.
 - The progression of Alzheimer's disease more closely correlates with the progression seen in humans.



Methodology



Results



Figure 1: X-ray scan of the Femurs.

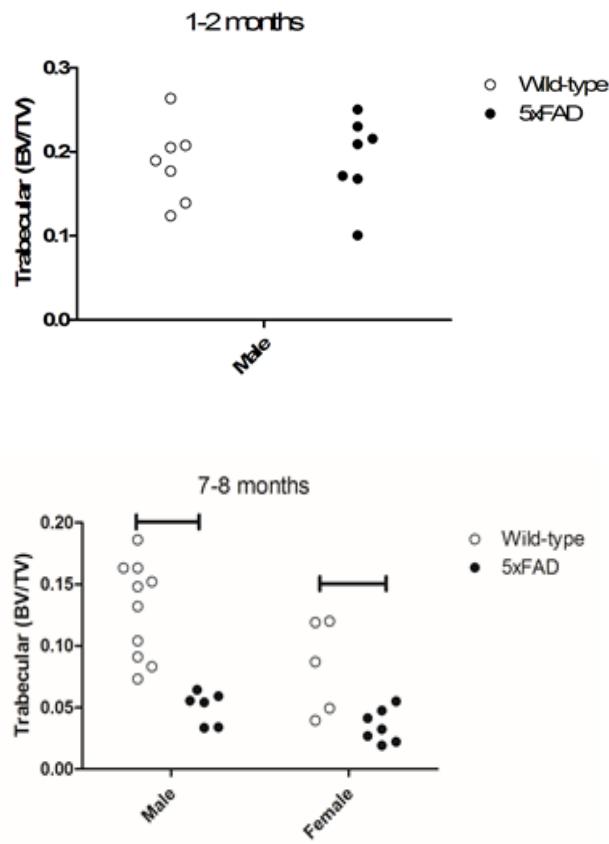


Figure 2: Trabecular Bone Volume per Total Volume (BV/TV) Comparison.

Figure 3: Trabecular Bone Volume per Total Volume (BV/TV) Comparison.

Results

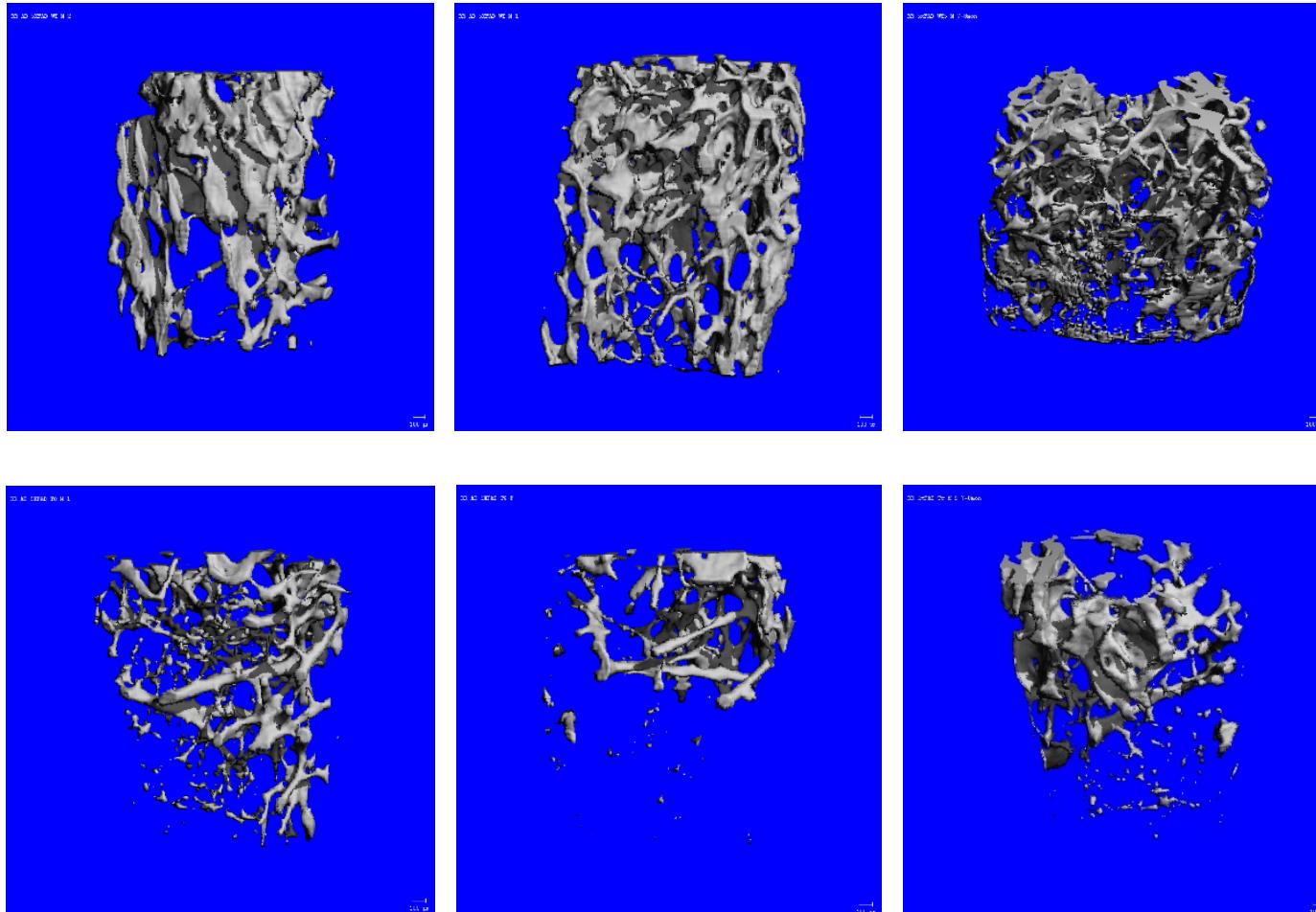


Figure 4: 3D Reconstruction of μ CT Scanned Trabecular Bone.

Results

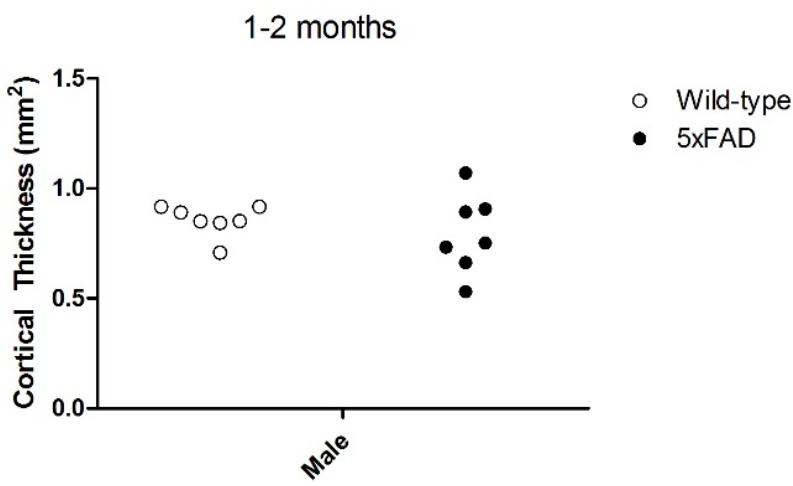


Figure 5: Cortical Area of Femur Bone

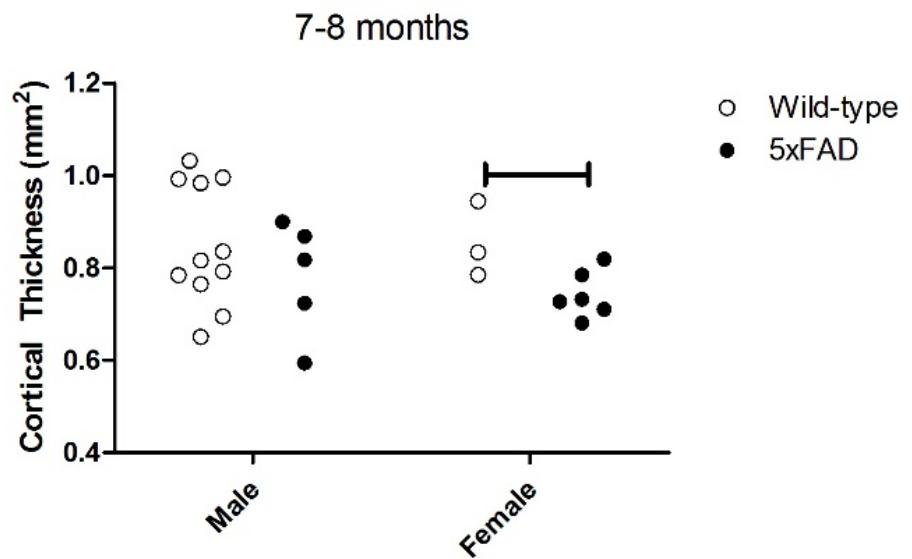
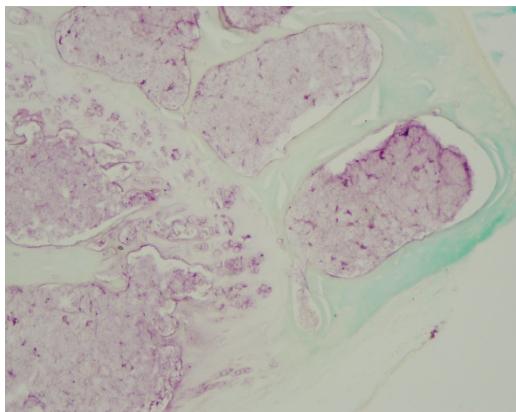


Figure 6: Cortical Area of Femur Bone

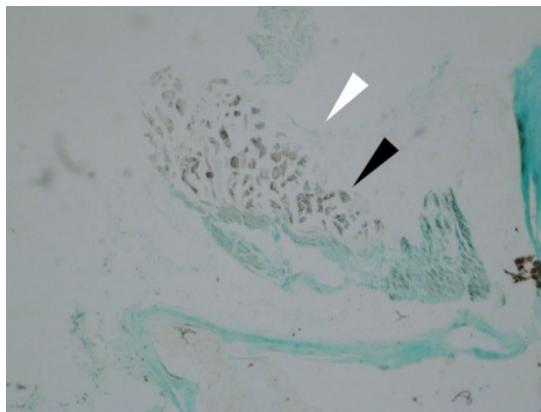
What Does This All Mean?

Future Work

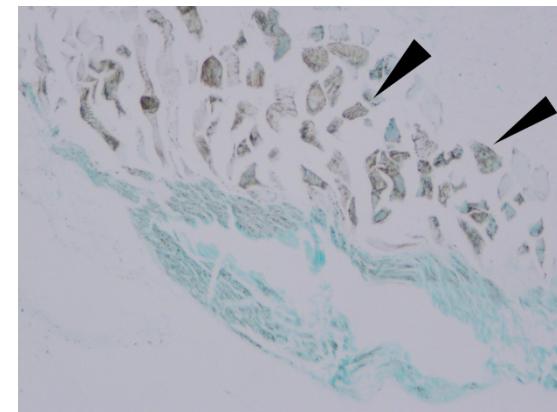
- Similar effects of Alzheimer's disease on the bones across multiple AD mouse models.
- In Continuation
 - Similar Effects → Similar Pathologies and Mechanisms?
 - TRAP Staining → RANK Pathway, osteoclasts
 - Sudan Black B staining → Progressed Aging, Senescence



TRAP Staining



Sudan Black B staining



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Acknowledgments

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