Microtubule force generation in axon growth cones

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Background

Background starting with neurons -> axons -> growth cones -> base model
Much of this comes first from BPS poster for the neuron to axon (condensed)
Then from proposal

Model

Model, modifications to the base model

Results

Results, what did this tell us.

Future Work

This model is constructed on a population based steady state model with temporal attributes included as an after-thought. A more rigorous approach would likely include an agent based model with mt motions, protein binding events, and actin network activity taking place with defined rates. An agent based simulation constructed in this way could explore more precise relationships between actin treadmilling, adhesion, and mt force generation by sliding and polymerization. Constructed properly, this agent based simulation could explore the two-dimensional landscape of the growth cone and investigate the role of mt force generation in growth cone guidance or lack thereof. Furthermore, such a model would have the advantage of being double validated by the original population model in the growth cone and agent based simulations in the axon.

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