Tiny Tubes **Big Problems**: The Microtubule Structure in Neurological Disorders

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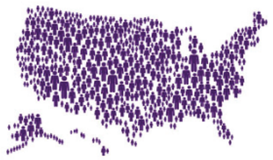
Neurological disorders are an expanding societal issue.



Nearly **7 million Americans** are living with Alzheimer's. By 2050, this number is projected to rise to nearly 13 million.

Adapted from Alz.org

5TH

Alzheimer's disease was the **fifth-leading cause of death** among people age 65 and older in 2021.

$360 billion

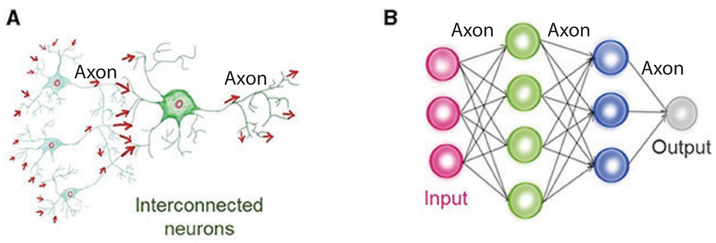
Health and long-term care costs for people living with dementia are projected to reach **$360 billion** in 2024 and nearly $1 trillion in 2050.

Neurological disorders represent a **growing disease burden** for aging populations.

Over 30 different neurological disorders are associated with loss of microtubules.
- Frototemporal dementia
- Alzheimer's
- Down's syndrome
- and more...

Many of these disorders affect the function of the axon that is essentially a long cable like extension form the cell body of a neuron.

What is an axon and why does a healthy neuron need one?



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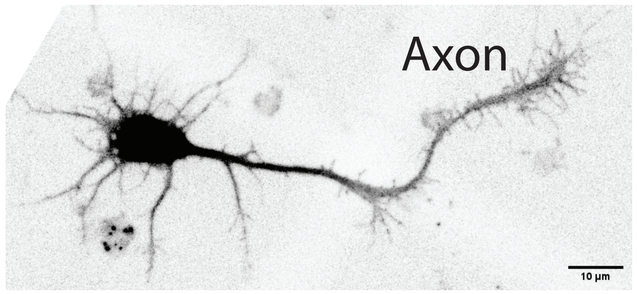
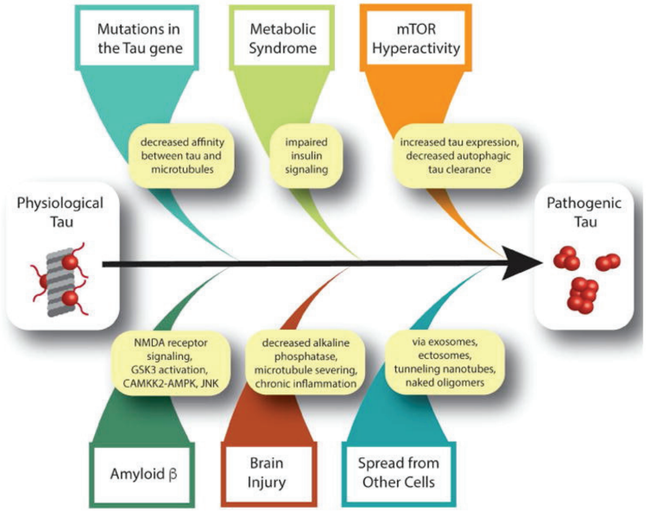


Axons connect the circuitry of nervous systems and other tissues.

Loss of axon **disrupts neural signaling** from your brain to your tissues.

Disrupting neural signaling via axons leads to pathological issues like **cognitive impairment and motor dysfunction**.

Neurological disorders affect microtubules. Why?



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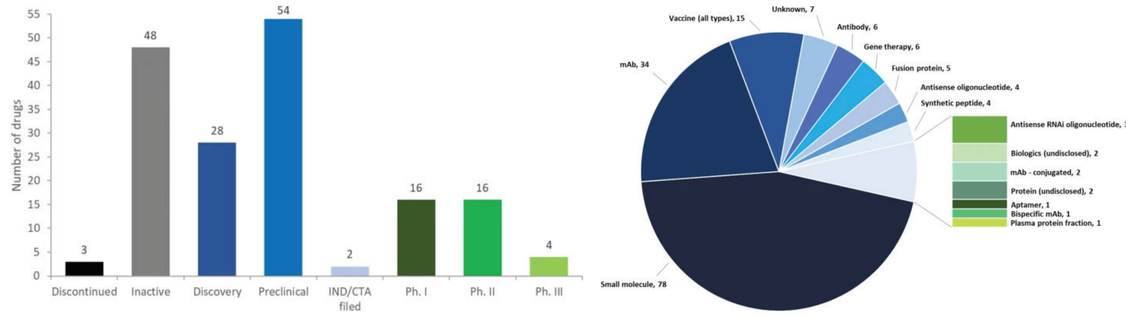
Tiny tubes inside of neurons called **microtubules are required to maintain an axon**.

These microtubules are **covered in proteins like Tau** that can either help the neuron or harm the neuron.

When Tau is mutated or dysregulated it leads to more than **30 different neurological disorders but we don't know why**.

To fix neurological disorders caused by Tau we must **rethink**.



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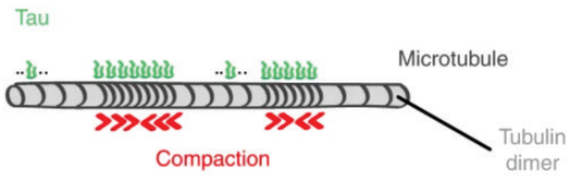

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We have tried to treat these Tau related neurological disorders by **targeting Tau**.

Now we know that **Tau changes the structure of microtubules**.

I'm studying the potential for this change in **structure to be a target for therapy**.

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