INNOVATION PARTNERSHIPS
UNIVERSITY OF MICHIGAN

Small Molecule Positive Modulators of Ligand-Induced Ret Signaling

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Category
Hardware
Therapeutics and Vaccines
Life Sciences

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OVERVIEW

Small molecule therapy for disease-modifying treatment of peripheral neuropathy

- Provides the first potential disease-modifying treatment for peripheral neuropathy
- May treat diabetes-, chemotherapy-, and trauma-induced peripheral neuropathies

BACKGROUND

Peripheral neuropathy (PN) is a disorder affecting peripheral nerves, impacting about 10% of the global population. PNs are frequently linked to conditions such as diabetes, HIV, and alcoholism, and can also result from physical trauma, hormonal imbalances, and chemotherapy, among others. Currently, treatment focuses on alleviating symptoms like pain through partially effective palliative methods, supplemented by physical therapy and lifestyle adjustments. However, existing treatments do not address the underlying disease mechanisms or prevent sensory loss. The absence of disease-modifying treatments necessitates the development of novel therapeutic approaches to halt or reverse the progression of PNs, a pervasive and debilitating condition.

INNOVATION

Researchers have discovered a non-peptidyl small molecule, XIB4035, that acts as a disease-modifying therapy. XIB4035 preserves the integrity of peripheral nerves and enhances neuronal survival across various mouse models, including transgenic, diabetic, and chemotherapy-induced models of PN. It functions as a positive modulator of the neurotrophic receptor tyrosine kinase Ret, crucial for nervous system development and maintenance. Additionally, a new family of compounds with improved properties has been identified, showing promising results in cell-based assays and low toxicity profiles. The ultimate goal is to develop a safe, effective drug-like molecule that can be clinically tested to either prevent or reverse peripheral neuropathies. Real-world applications include treating neuropathies associated with diabetes, chemotherapy, and physical trauma, addressing a significant unmet medical need.