INNOVATION PARTNERSHIPS
UNIVERSITY OF MICHIGAN

Small Molecule Positive Modulators of Ligand-Induced Ret Signaling

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Accelerate Blue Foundry - 2025/Life Sciences

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Accelerate Blue Foundry - 2025 (Life Sciences)

OVERVIEW

A new family of small-molecule drugs has been identified that safely enhances the protective Ret signaling pathway in nerve cells, offering a novel, disease-modifying approach for treating peripheral neuropathy and potentially other neurological disorders where current therapies only provide symptomatic relief.

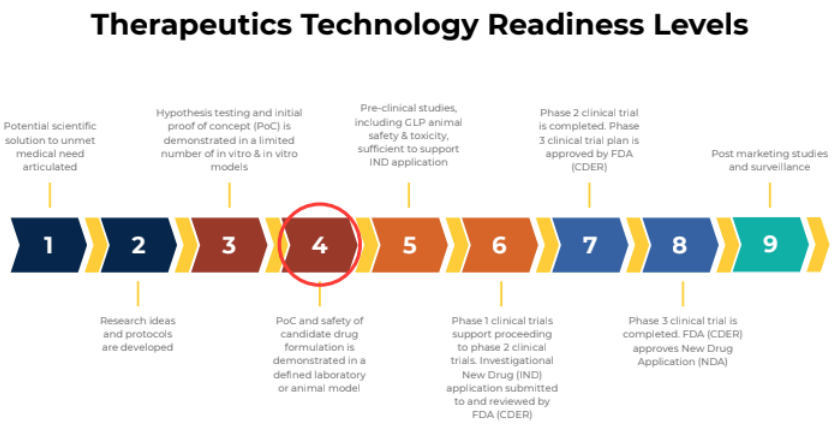
DESCRIPTION

These small molecules work by boosting the effects of natural signals (trophic factors) that activate the Ret receptor on nerve cells, which is essential for nerve survival and repair. Unlike earlier treatments that used protein-based therapies (which often cause widespread side effects due to broad activity in the body), these compounds only enhance Ret signaling where both the receptor and its natural activators are present—providing targeted, safer intervention. In preclinical lab and mouse models of chemotherapy induced neuropathy, a previously characterized molecule, XIB4035, as well as newly discovered lead compounds preserved nerve integrity, reduced pain sensitivity, and showed a low toxicity profile.The newly discovered analogs have improved drug-like properties, making them strong candidates for further development.

VALUE PROPOSITION

- Represents a first-in-class, oral or topical, disease-modifying treatment for peripheral neuropathy by directly protecting and repairing nerves, not just masking pain.
- Delivers greater safety and fewer off-target effects because amplification of signaling only occurs in tissues where it is naturally needed.
- Lead molecules have shown efficacy across multiple forms of peripheral neuropathy in animal models and possess favorable pharmacological attributes for clinical development.

TECHNOLOGY READINESS LEVEL



INTELLECTUAL PROPERTY STATUS

Patent applications pending.

MARKET OPPORTUNITY

Peripheral neuropathy affects over 2% of the global population, especially among people with diabetes, cancer, and chronic illnesses, creating a vast unmet need for therapies that go beyond symptom management. These small molecules could transform care in neurology, diabetes, cancer survivorship, and infectious disease by offering genuine nerve protection and restoration.

Growing rates of diabetes and chemotherapeutic treatments are increasing neuropathy cases worldwide, underscoring the urgent demand for safe, mechanism-based therapies with significant commercial and clinical impact.

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