

Motixafortide (BL-8040) Overview

Overview:

Motixafortide is a high-affinity CXCR4 antagonist peptide that blocks the CXCR4 chemokine receptor, used in hematopoietic stem cell mobilization and studied for its potential in cancer therapy and immune modulation.

Mechanism of Action:

CXCR4 Inhibition:

Motixafortide binds to CXCR4 receptors on hematopoietic stem cells (HSCs) and other immune cells, disrupting the CXCL12/SDF-1 α -CXCR4 interaction.

Stem Cell Mobilization:

By blocking this pathway, it releases HSCs from bone marrow niches into peripheral blood for easier collection.

Anti-Tumor Activity:

Also studied for disrupting tumor microenvironments and enhancing anti-cancer immune responses.

Physiological Functions in the Body:

- Stem Cell Mobilization: Increases circulating CD34+ HSCs for transplantation.
- Immune Modulation: Alters T-cell and myeloid cell trafficking, supporting immune system activation.
- Potential Anti-Metastatic Effect: Interferes with CXCR4-dependent cancer cell survival.

Clinical & Research Use:

Investigational Uses:

FDA breakthrough therapy designation for stem cell mobilization in multiple myeloma.

Studied for solid tumors, AML, and pancreatic cancer.

Combination Therapy: Often used with G-CSF (filgrastim) to boost HSC yield.

Dosing (Clinical Trials):

Stem Cell Mobilization (study setting):

Typical dose: 1–2 mg/kg subcutaneous injection.

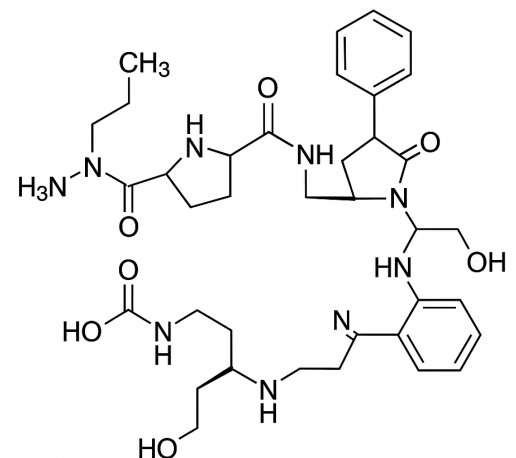
Single or multiple injections before apheresis.

Anti-Tumor Trials:

Dosing and schedules vary based on protocol and combination therapies.

Conclusion:

Motixafortide is a potent CXCR4 antagonist that mobilizes stem cells and has promising anti-tumor and immune-modulating effects. It represents an exciting area of clinical and translational research for hematologic and solid cancers.



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