SS-31
Research Applications

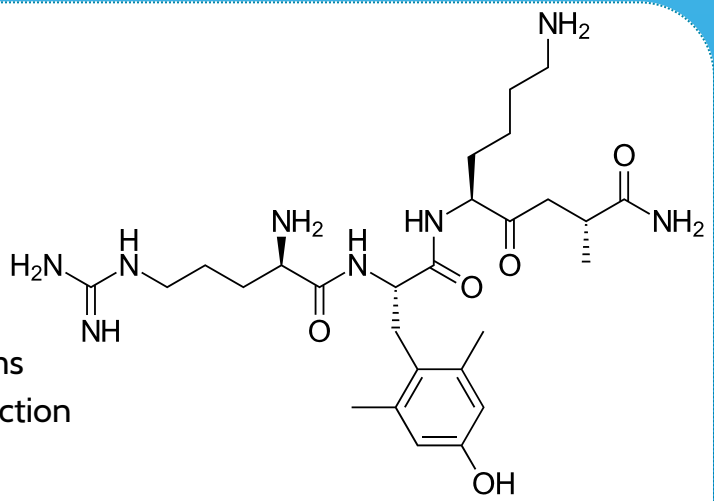
US Peptide Co

Mechanism of Action

SS-31 (Elamipretide) is a mitochondria-targeted tetrapeptide with unique cell-penetrating properties. In research models, it selectively binds to cardiolipin, a phospholipid located exclusively in the inner mitochondrial membrane. This interaction helps stabilize mitochondrial cristae structure, optimize electron transport chain function, and reduce reactive oxygen species production, making it valuable for studying mitochondrial dynamics and cellular energy metabolism.

Molecular Profile

- Chemical Formula: $C_{35}H_{55}N_{11}O_6S$
- Molecular Weight: 773.9 Da
- Sequence: D-Arg-Dmt-Lys-Phe-NH_2



Research Applications

- Mitochondrial function and bioenergetics research
- Investigation of cellular redox regulation mechanisms
- Models examining cardioprotection and neuroprotection
- Research on oxidative stress response pathways

Laboratory Considerations

- Store lyophilized powder at -20°C
- Reconstituted solutions should be stored at 4°C
- Protect from light and oxidizing agents

References

1. Szeto HH. First-in-class cardiolipin-protective compound as a therapeutic agent to restore mitochondrial bioenergetics. Br J Pharmacol. 2014;171(8):2029-2050.
2. Birk AV, et al. The mitochondrial-targeted compound SS-31 re-energizes ischemic mitochondria by interacting with cardiolipin. J Am Soc Nephrol. 2013;24(8):1250-1261.
3. Zhao K, et al. Cell-permeable peptide antioxidants targeted to inner mitochondrial membrane inhibit mitochondrial swelling, oxidative cell death, and reperfusion injury. J Biol Chem. 2004;279(33):34682-34690.
4. Siegel MP, et al. Mitochondrial-targeted peptide rapidly improves mitochondrial energetics and skeletal muscle performance in aged mice. Aging Cell. 2013;12(5):763-771.