

DC67605 | PyCB lipid

Instructions for Use

PyCB lipid (MeDZ) is a rationally designed zwitterionic ionizable lipid that serves as a core functional component in the novel three-component (ThrCo) lipid nanoparticle (LNP) platform. It is synthesized by covalently attaching a zwitterionic PyCB structure to the hydroxyl group of the clinically available ionizable lipid ALC-0315. Its key feature is its pH-responsive behavior. At physiological pH (~7.4), the PyCB headgroup exhibits zwitterionic properties, forming charge-assisted hydrogen bonds with water molecules (PyCB-H₂O complexes). This confers high hydrophilicity to the LNP surface, enhancing stability in aqueous environments and reducing nonspecific protein adsorption in the bloodstream. This zwitterionic surface effectively mimics and replaces PEGylated lipids, thereby avoiding PEG immunogenicity and the associated Accelerated Blood Clearance (ABC) effect upon repeated administrations. Crucially, in the acidic environment of endosomes (pH ~6.5), the PyCB group undergoes strong protonation, rapidly transforming into a cationic state (PyCB-H₃O⁺ complexes). This promotes efficient fusion with and disruption of the endosomal membrane, facilitating the escape and cytoplasmic release of encapsulated mRNA. By replacing both cholesterol and PEGylated lipids in traditional LNPs, PyCB lipid enables the redirection of LNP biodistribution from the liver to the spleen, achieving superior spleen-specific mRNA translation and enhancing antigen presentation for potent immune activation.

Product information

CAS No.	Not available
Chemical Name	PyCB lipid
Formula	C ₅₆ H ₁₀₀ N ₂ O ₈
M.Wt	929.42
Purity	ELSD-HPLC>95%
Storage	Original product: up to 1 year under the storage conditions stated on the vial, kept tightly sealed. Stock solutions: aliquots at -20°C, generally up to one month.
Shipping condition	Ships from Shanghai. Pure lipid is stable during ice-pack transport.

Formulation & study context

Literature values apply to the cited study only. Administration routes describe research, not clinical instructions.

A complete product-specific formulation has not been verified. No standard ratio is substituted.

N/P ratio	Not reported in the verified record
Cargo	Not available in the verified record
Administration route	Not available in the verified record
Animal model	Not available in the verified record
Formulation process	Not available in the verified record

N/P is a nitrogen-to-phosphate molar ratio. Lipid:cargo mass ratio is a different quantity and must not be used as N/P.

Stock-solution preparation table

Calculated using product-page MW: 929.42 g/mol. Volumes are final solution volumes.

Mass	1 mM	5 mM	10 mM
10 mg	10.759 mL	2.152 mL	1.076 mL
25 mg	26.898 mL	5.380 mL	2.690 mL
50 mg	53.797 mL	10.759 mL	5.380 mL
100 mg	107.594 mL	21.519 mL	10.759 mL
250 mg	268.985 mL	53.797 mL	26.898 mL

Volume (mL) = mass (mg) × 1000 / [MW (g/mol) × concentration (mM)]. Mathematical conversions only; not measured solubility. Confirm solvent compatibility and the exact material before preparation.

Handling & storage

Provided that storage conditions are as stated on the product vial and the vial is kept tightly sealed, the product can be stored for up to 1 year.

Wherever possible, prepare and use solutions on the same day. If stock solutions must be prepared in advance, store them as aliquots in tightly sealed vials at -20°C. Generally, these will be usable for up to one month.

Before use, and prior to opening the vial, allow the product to equilibrate to room temperature for at least 1 hour.

References

Not available