

DC60856 | DMA4-H228

Instructions for Use

DMA4-H228 is a novel, biodegradable lipidoid specifically engineered for spleen-targeted mRNA delivery. Its structure combines a dimethylamino (DMA4) headgroup with a unique hyperbranched lipid tail (H228) synthesized via Michael addition, incorporating ester bonds for enhanced biodegradability. This design enables the formation of stable lipid nanoparticles (LNPs) (~170 nm) with high mRNA encapsulation efficiency (>96%).

Critically, DMA4-H228 exhibits exceptional intrinsic tropism for the spleen (>98% targeting efficiency after IV administration), requiring no external targeting ligands. It selectively delivers mRNA to splenic antigen-presenting cells (APCs), including dendritic cells, macrophages, and B cells. This triggers potent immune activation: rapid IFN α secretion, upregulation of APC maturation markers (CD86/CD40), and robust antigen-specific immune responses.

Demonstrating significant therapeutic potential, DMA4-H228-based mRNA vaccines effectively inhibit tumor growth in melanoma models (e.g., B16F10-OVA). This correlates with increased tumor-infiltrating CD8⁺ T cells, a shift towards pro-inflammatory M1 macrophages, elevated antigen-specific antibodies (IgG), and strong T cell responses (evidenced by IFN γ ⁺ spots). Its ability to bypass liver tropism and directly activate splenic APCs makes DMA4-H228 a powerful platform for next-generation mRNA vaccines and cancer immunotherapy.

Product information

CAS No.	Not available
Chemical Name	DMA4-H228
Formula	C57H106N4O10
M.Wt	1,007.49
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: 1007.49 g/mol. Volumes are final solution volumes.

Mass	1 mM	5 mM	10 mM
10 mg	9.926 mL	1.985 mL	0.993 mL
25 mg	24.814 mL	4.963 mL	2.481 mL
50 mg	49.628 mL	9.926 mL	4.963 mL
100 mg	99.257 mL	19.851 mL	9.926 mL
250 mg	248.141 mL	49.628 mL	24.814 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

Dimethylamino-based synthetic lipidoid nanoparticles for selective mRNA delivery to splenic antigen-presenting cells-Journal of Controlled Release
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