DC68227 | E20

Instructions for Use

E20 is a charge-switching ionizable S-lipid containing a tertiary amine, a carboxylic acid, two secondary alcohols and two branched ester-linked hydrophobic domains. The cited study formulated E20 into switchable nanoparticles (SNPs) for mRNA and plasmid-DNA delivery. Literature-reported E20 SNP data include an apparent pKa of 4.99 for becoming neutral, an N/P ratio of 4.1 in the reported four-component formulation, efficient hEPO mRNA expression after intravenous administration, low immunostimulatory activity in the reported models and activity in an intratracheal IL-22 mRNA acute-lung-injury study. All formulation and performance information shown below is literature-derived study evidence, not a product specification or a guarantee of reproducible LNP performance.

Product information

CAS No.	Not available
Chemical Name	E20
Formula	C55H107NO8
M.Wt	910.46
Purity	Not available
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.

Component	mol%	Role
E20	35.9	Ionizable lipid
DOPE	24.2	Helper phospholipid
Cholesterol	38.7	Sterol
DMG-PEG2000	1.2	PEG lipid
Reported total	100	Source values retained

N/P ratio	4.1
Total lipid:cargo weight ratio	21:1 to 24:1 total lipids:mRNA
Buffer & pH	mRNA in 10 mM citrate buffer, pH 4.0; dialysed against PBS, pH 7.4
Cargo	hEPO mRNA

Administration route	Intravenous injection (retro-orbital IV)
Dose	0.1 mg mRNA/kg, single dose
Animal model	Wild-type BALB/c mice, 10-16 weeks old, 18-20 g
Formulation process	Microfluidic mixing with aqueous phase at 3 mL/min and ethanolic lipid phase at 1 mL/min, followed by dialysis against 1,000-fold excess PBS at 4 °C for 2-4 h

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: 910.46 g/mol. Volumes are final solution volumes.

Mass	1 mM	5 mM	10 mM
10 mg	10.983 mL	2.197 mL	1.098 mL
25 mg	27.459 mL	5.492 mL	2.746 mL
50 mg	54.917 mL	10.983 mL	5.492 mL
100 mg	109.835 mL	21.967 mL	10.983 mL
250 mg	274.586 mL	54.917 mL	27.459 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

Cited literature for this formulation and performance dataset Liang D, Qi Y, Han H, et al. Charge-switching ionizable lipids lower the toxicity of lipid nanoparticles. Nature Nanotechnology. Published online September 8, 2026. DOI: 10.1038/s41565-026-02262-6 Structure: main Figure 2a and SI Figures S6, S14 and S51; formulation and N/P ratio: SI Section 4.1 and Table S1; performance: main Figures 2-5 and the cited SI figures.