

DC60211 | TCL053

Instructions for Use

TCL053 is an ionizable amino lipid.¹ It has been used in the generation of lipid nanoparticles (LNPs) and has a pKa value of 6.8. LNPs containing TCL053 and encapsulating mRNA encoding the Cas9 nuclease, in combination with LNPs containing TCL053 and encapsulating single-guide RNA (sgRNA) targeting the Rosa26 locus, have been used to induce CRISPR-mediated gene editing in the mouse gastrocnemius muscle. TCL053 is an ionizable lipid that has received FDA approval for preparing mRNA vaccines. It is a three-tailed ionizable lipid to overcome the disadvantage of nonrepeatable administration of AAV vectors. In addition, combined with limb perfusion administration, TCL053 iLNPs could transiently deliver CRISPR-Cas9 mRNA and sgRNA to multiple muscle tissues, reducing immunogenicity and increasing the safety of iLNPs. It is great progress for treating Duchenne muscular dystrophy and other diseases that require multiple doses.

Product information

CAS No.	Not available
Chemical Name	TCL053
Formula	C53H95NO8
M.Wt	874.32
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: 874.32 g/mol. Volumes are final solution volumes.

Mass	1 mM	5 mM	10 mM
10 mg	11.437 mL	2.287 mL	1.144 mL
25 mg	28.594 mL	5.719 mL	2.859 mL
50 mg	57.187 mL	11.437 mL	5.719 mL
100 mg	114.375 mL	22.875 mL	11.437 mL
250 mg	285.936 mL	57.187 mL	28.594 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

1. Kenjo, E., Hozumi, H., Makita, Y., et al. Low immunogenicity of LNP allows repeated administrations of CRISPR-Cas9 mRNA into skeletal muscle in mice. Nat. Commun. 12(1), 7101 (2021).