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(54) Title: CONSTRAINED IONIZABLE CATIONIC LIPIDS AND LIPID NANOPARTICLES

(57) Abstract: Ionizable cationic lipids, methods for synthesizing the same, intermediates useful in synthesis of the ionizable cationic lipids and methods of synthesizing the intermediates are disclosed. The ionizable cationic lipids are useful as a component of lipid nanoparticles (LNP), which in turn can be used for the delivery of nucleic acids into cells in vivo or ex vivo. LNP compositions are also disclosed, including LNP comprising a functionalized lipid to enable conjugation of a binding moiety, and targeted LNP (tLNP), that is an LNP in which a binding moiety has been conjugated to the functionalized lipid and can serve as a targeting moiety to direct the tLNP to a desired tissue or cell type.



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