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(71) Applicant: **GENZYME CORPORATION** [US/US]; 450 Water Street, Cambridge, MA 02141 (US).

(72) Inventors: **HUANG, Zhaohua, Richard**; c/o Sanofi Patent Department, 450 Water Street, Cambridge, MA 02141 (US). **WANG, Sheryl**; c/o Sanofi Patent Department, 450 Water Street, Cambridge, MA 02141 (US).

(74) Agent: **ZAGIEBOYLO, Adrienne, C.** et al.; Wolf, Greenfield & Sacks, P.C., 600 Atlantic Avenue, Boston, MA 02210-2206 (US).

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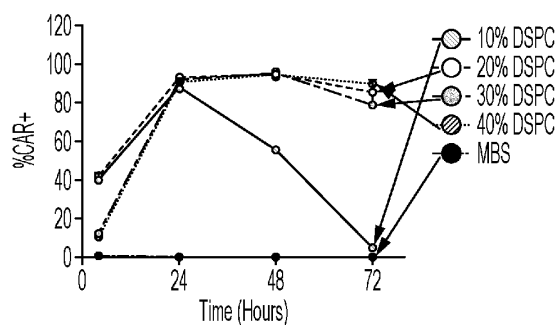


FIG. 1A

(57) Abstract: Provided are lipid nanoparticles, compositions, and methods of making and using the same. The lipid nanoparticles contain ionizable lipids, structural lipids, PEG lipids and specific amounts of helper lipids. The lipid nanoparticles may further contain a cell targeting group coupled to a PEG lipid. The lipid nanoparticles may carry a cargo, e.g., a mRNA. The lipid nanoparticles may be used for transfection of cells, e.g., immune cells or hematopoietic stem cells.