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(71) Applicant: ARCTURUS THERAPEUTICS, INC.

[US/US]; 10628 Science Center Drive, Suite 250, San Diego, California 92121 (US).

(72) Inventors: BAO, Yanjie; c/o Arcturus Therapeutics, Inc.,

10628 Science Center Drive, Suite 250, San Diego, California 92121 (US). CLEMENTE, Brenda; c/o Arcturus Therapeutics, Inc., 10628 Science Center Drive, Suite 250, San Diego, California 92121 (US). KARMALI, Priya Prakash; c/o Arcturus Therapeutics, Inc., 10628 Science Center Drive, Suite 250, San Diego, California 92121 (US).

(74) Agent: VARSHNEYA, Pooja et al.; Mintz Levin Cohn Ferris Glovsky and Popeo, P.C., One Financial Center, Boston, Massachusetts 02111 (US).

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(54) Title: LIPID NANOPARTICLES ENCAPSULATION OF LARGE RNA



FIG. 1

(57) Abstract: A method of producing lipid-encapsulated RNA nanoparticles includes flowing an aqueous solution comprising an RNA through a 1st tube having a first inner diameter (ID); the RNA comprises from about 6,000 to about 13,000 nucleotides; flowing an ethanol solution comprising lipids through a 2nd tube having a second inner diameter (ID), at a flow rate of about 0.2 to about 1 times relative to the aqueous solution through the 1st tube, the lipids comprise a cationic lipid; and mixing the ethanol solution with the aqueous solution; the first ID and second ID and flow rates through the 1st tube and 2nd tube are selected to produce a shear force sufficiently low to preserve the integrity of the RNA; the mixing produces an output solution flowing in the 1st tube comprising a turbulent flow of the RNA and the lipids in between about ethanol, the lipid-encapsulated RNA nanoparticles having a bilayer structure.

[Continued on next page]

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