(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
24 October 2013 (24.10.2013)

WIPO | PCT

(10) International Publication Number
WO 2013/158141 A1

(51) International Patent Classification:
A61K 31/785 (2006.01)

(21) International Application Number:
PCT/US2012/051973

(22) International Filing Date:
23 August 2012 (23.08.2012)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/625,955 18 April 2012 (18.04.2012) US
13/592,403 23 August 2012 (23.08.2012) US

(71) Applicant *(for all designated States except US)*: **ARROWHEAD RESEARCH CORPORATION**; 225 S. Lake Ave, Suite 1050, Pasadena, CA 91101 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **WAKEFIELD, Darren, H.** [US/US]; 3168 Stoneman Drive, Fitchburg, WI 53711 (US). **ROSSI, Nicholas** [CA/US]; 2621 Van Hise Ave., Madison, WI 53705 (US). **ROZEMA, David, B.** [US/US]; 9418 Whippoorwill Way, Middleton, WI 53562 (US). **ALMEIDA, Lauren** [US/US]; 490 Togstad Glenn, Madison, WI 53711 (US). **PERILLA-NICHOLAS, Anthony, L.** [US/US]; 926 Erin St., Madison, WI 53715 (US).

(74) Agent: **EKENA, Kirk**; Arrowhead Madison Inc., 465 Science Drive, Suite C, Madison, WI 53711 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

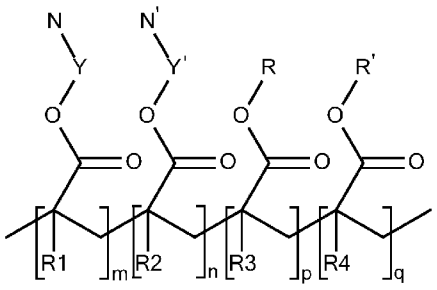
Published:

— *with international search report (Art. 21(3))*

— *with sequence listing part of description (Rule 5.2(a))*

WO 2013/158141 A1

(54) Title: POLY(ACRYLATE) POLYMERS FOR IN VIVO NUCLEIC ACID DELIVERY



amphipathic poly(acrylate) random copolymer

(57) Abstract: The present invention is directed membrane active poly(acrylate) polymers and compositions for targeted delivery of RNA interference (RNAi) polynucleotides cells in vivo. RNAi polynucleotides are conjugated to the poly(acrylate) polymers and the polymers are reversibly modified to enable in vivo targeted delivery. Membrane activity of the poly(acrylate) provides for movement of the RNAi polynucleotides from outside the cell to inside the cell. Reversible modification provides physiological responsiveness.