



(51) International Patent Classification:

A61K 35/768 (2015.01) A61P 35/00 (2006.01)

C07K 14/715 (2006.01) C12N 7/00 (2006.01)

C12N 15/86 (2006.01)

(21) International Application Number:

PCT/US2022/026703

(22) International Filing Date:

28 April 2022 (28.04.2022)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/182,243 30 April 2021 (30.04.2021) US

(71) Applicant: **KALIVIR IMMUNOTHERAPEUTICS, INC.** [US/US]; 240 Alpha Drive, Pittsburgh, PA 15238 (US).

(72) Inventors: **THORNE, Stephen, Howard**; 610 Whispering Pines Drive, Pittsburgh, PA 15238 (US). **ZHANG, Mingrui**; 6251 Broad Street, #112, Pittsburgh, PA 15206 (US).

(74) Agent: **HENDRICKS, Diana, G.** et al.; Greenberg Traurig, LLP, One International Place, Suite 2000, Boston, MA 02110 (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, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, 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, ST, 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,

(54) Title: ONCOLYTIC VIRUSES FOR MODIFIED MHC EXPRESSION

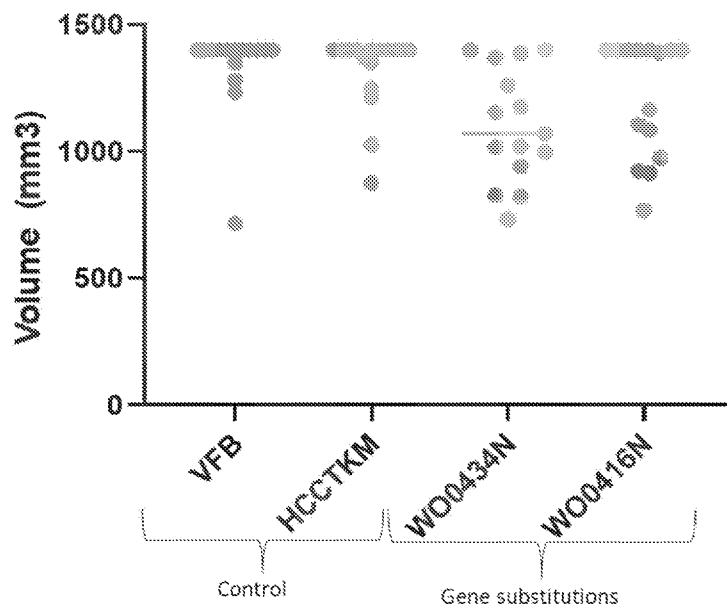


FIG. 1

(57) Abstract: The present disclosure provides for recombinant oncolytic viruses with gene deletions or insertions which result in downregulation of Major Histocompatibility Complex class I and alternatively or additively upregulation of Major Histocompatibility Complex class II. Immunologic and pharmaceutical compositions comprising these recombinant viruses and methods of using these compositions are also presented.

TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

Published:

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*