



(51) International Patent Classification:

A61K 35/12 (2015.01) *C12N 5/0781* (2010.01)
A61K 35/17 (2015.01) *C12N 5/10* (2006.01)
A61K 39/00 (2006.01)

(21) International Application Number:

PCT/US2021/048944

(22) International Filing Date:

02 September 2021 (02.09.2021)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/073,799 02 September 2020 (02.09.2020) US

(71) Applicant: WALKING FISH THERAPEUTICS

[US/SA]; 280 Utah Avenue, Suite 250, South San Francisco, California 94080 (US).

(72) Inventors: BOYLE, Kathleen; c/o Walking Fish Therapeutics,

280 Utah Avenue, Suite 250, South San Francisco, California 94080 (US). PARK, Hangil; c/o Walking Fish Therapeutics, 280 Utah Avenue, Suite 250, South San Francisco, California 94080 (US). KOTHAKOTA, Srinivas; c/o Walking Fish Therapeutics, 280 Utah Avenue, Suite 250, South San Francisco, California 94080 (US). SEL-

BY, Mark; c/o Walking Fish Therapeutics, 280 Utah Avenue, Suite 250, South San Francisco, California 94080 (US). BRENNAN, Thomas; c/o Walking Fish Therapeutics, 280 Utah Avenue, Suite 250, South San Francisco, California 94080 (US). WILLIAMS, Lewis T.; c/o Walking Fish Therapeutics, 280 Utah Avenue, Suite 250, South San Francisco, California 94080 (US).

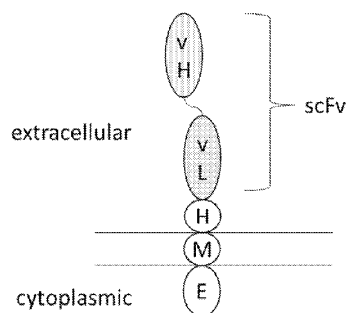
(74) Agent: MAHAN, Amy L.; c/o McDermott Will & Emery LLP, 500 North Capitol Street, NW, Washington, District of Columbia 20001 (US).

(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, 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,

(54) Title: MODIFIED B CELLS AND METHODS OF USE THEREOF

Example of cBCR on cell membrane



vH: heavy chain variable region
vL: light chain variable region
H: hinge region
M: transmembrane domain
E: cytoplasmic signaling domain

FIG. 1

(57) Abstract: The present invention relates to genetically modified B cells and their uses thereof, for example, for the treatment of a variety of diseases and disorders, including cancer, heart disease, inflammatory disease, muscle wasting disease, neurological disease, and the like. In certain embodiments, the invention relates to an isolated modified B cell ("CAR-B cell"), capable of expressing a chimeric receptor ("CAR-B receptor"), wherein said chimeric receptor comprises (a) an extracellular domain; (b) a transmembrane domain; and (c) a cytoplasmic domain that comprises at least one signaling domain. In various embodiments, the invention comprises an isolated modified B cell, wherein said B cell is capable of expressing and secreting a payload, wherein the payload is not naturally expressed in a B cell or is expressed at higher levels than is naturally expressed in a B cell. In various embodiments, the payload is an antibody or fragment thereof.

[Continued on next page]

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, KM, ML, MR, NE, SN, TD, TG).

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))*