

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
18 August 2022 (18.08.2022)



(10) International Publication Number
WO 2022/174099 A3

(51) International Patent Classification:
C12N 9/22 (2006.01)

(21) International Application Number:
PCT/US2022/016214

(22) International Filing Date:
11 February 2022 (11.02.2022)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
63/148,421 11 February 2021 (11.02.2021) US
63/154,437 26 February 2021 (26.02.2021) US

(71) Applicant: **ARBOR BIOTECHNOLOGIES, INC.**
[US/US]; 20 Acorn Park Drive, Tower 500, Cambridge,
MA 02140 (US).

(72) Inventors: **CHONG, Shaorong**; c/o Arbor Biotechnolo-
gies, Inc., 20 Acorn Park Drive, Tower 500, Cambridge,
MA 02140 (US). **LU, Wei-Cheng**; c/o Arbor Biotechnolo-
gies, Inc., 20 Acorn Park Drive, Tower 500, Cambridge,
MA 02140 (US). **HILBERT, Brendan, Jay**; c/o Arbor
Biotechnologies, Inc., 20 Acorn Park Drive, Tower 500,
Cambridge, MA 02140 (US). **WESSELLS, Quinton, Nor-**
man; c/o Arbor Biotechnologies, Inc., 20 Acorn Park Drive,
Tower 500, Cambridge, MA 02140 (US). **DITOMMASO,**
Tia, Marie; c/o Arbor Biotechnologies, Inc., 20 Acorn Park
Drive, Tower 500, Cambridge, MA 02140 (US). **GARRI-**
TY, Anthony, James; c/o Arbor Biotechnologies, Inc., 20
Acorn Park Drive, Tower 500, Cambridge, MA 02140 (US).

(74) Agent: **MICHAUD, Susan M.**; Clark & Elbing LLP, 101
Federal Street, 15th Floor, 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,
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))
- with sequence listing part of description (Rule 5.2(a))

(88) Date of publication of the international search report:
06 October 2022 (06.10.2022)

WO 2022/174099 A3

(54) Title: COMPOSITIONS COMPRISING A VARIANT CAS12I4 POLYPEPTIDE AND USES THEREOF

(57) Abstract: The present invention relates to variant Cas12i4 polypeptides, methods of producing the variant Cas12i4 polypeptides, processes for characterizing the variant Cas12i4 polypeptides, cells comprising the variant Cas12i4 polypeptides, and methods of using the variant Cas12i4 polypeptides. The invention further relates to complexes comprising a variant Cas12i4 polypeptide and an RNA guide, methods of producing the complexes, processes for characterizing the complexes, cells comprising the complexes, and methods of using the complexes.