



- (51) International Patent Classification:
C12N 15/82 (2006.01)
- (21) International Application Number:
PCT/US2023/060949
- (22) International Filing Date:
20 January 2023 (20.01.2023)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
63/266,967 20 January 2022 (20.01.2022) US
63/379,056 11 October 2022 (11.10.2022) US
- (71) Applicant: **FLAGSHIP PIONEERING INNOVATIONS VII, LLC** [US/US]; 55 Cambridge Parkway, 8th Floor, Suite 800E, Cambridge, Massachusetts 02142 (US).
- (72) Inventors: **KHAKHAR, Arjun Devang**; c/o FLAGSHIP PIONEERING INNOVATIONS VII, LLC, 55 Cambridge Parkway, 8th Floor, Suite 800E, Cambridge, Massachusetts 02142 (US). **MARTIN, Barry Andrew**; c/o

FLAGSHIP PIONEERING INNOVATIONS VII, LLC, 55 Cambridge Parkway, 8th Floor, Suite 800E, Cambridge, Massachusetts 02142 (US). **NIU, Yajie**; c/o FLAGSHIP PIONEERING INNOVATIONS VII, LLC, 55 Cambridge Parkway, 8th Floor, Suite 800E, Cambridge, Massachusetts 02142 (US). **SPRAGUE, Daniel Alexander**; c/o FLAGSHIP PIONEERING INNOVATIONS VII, LLC, 55 Cambridge Parkway, 8th Floor, Suite 800E, Cambridge, Massachusetts 02142 (US). **DENNIS, Elizabeth Jane Antonelli**; c/o FLAGSHIP PIONEERING INNOVATIONS VII, LLC, 55 Cambridge Parkway, 8th Floor, Suite 800E, Cambridge, Massachusetts 02142 (US). **HALAC, Mehmet Ali**; c/o FLAGSHIP PIONEERING INNOVATIONS VII, LLC, 55 Cambridge Parkway, 8th Floor, Suite 800E, Cambridge, Massachusetts 02142 (US). **HAO, Yumeng**; c/o FLAGSHIP PIONEERING INNOVATIONS VII, LLC, 55 Cambridge Parkway, 8th Floor, Suite 800E, Cambridge, Massachusetts 02142 (US). **KREMER, James Michael**; c/o FLAGSHIP PIONEERING INNOVATIONS VII, LLC, 55 Cambridge Parkway, 8th Floor, Suite 800E, Cambridge, Massachusetts 02142 (US). **KUMAR, Jayashree**; c/o FLAGSHIP PIONEERING INNOVATIONS VII, LLC, 55 Cambridge Parkway, 8th Floor, Suite 800E, Cam-

(54) Title: POLYNUCLEOTIDES FOR MODIFYING ORGANISMS

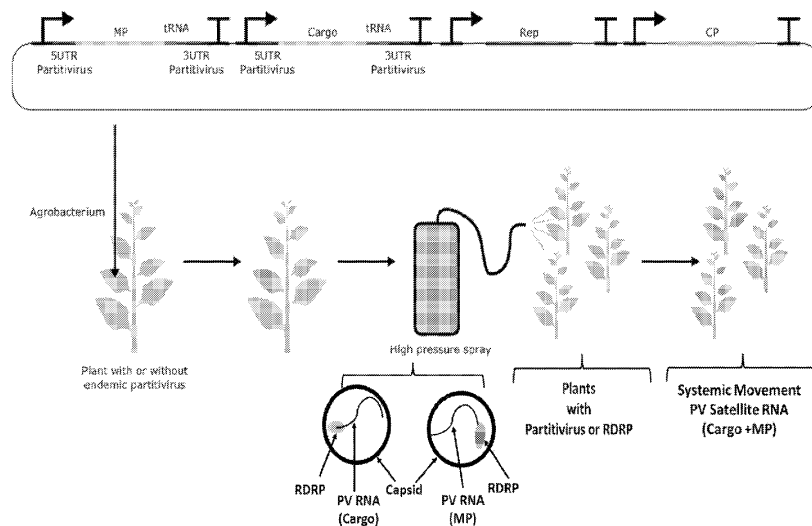


FIGURE 2

(57) Abstract: Synthetic partitiviral satellite RNA molecules and satellite particles containing the same are disclosed. Also disclosed are methods of using the partitiviral satellite RNA molecules and satellite particles containing the same to change plant phenotypes, improve plant stress resistance, and improve plant pest and pathogen resistance.

[Continued on next page]

bridge, Massachusetts 02142 (US). **LIN, Chien-Yuan**; c/o FLAGSHIP POINEERING INNOVATIONS VII, LLC, 55 Cambridge Parkway, 8th Floor, Suite 800E, Cambridge, Massachusetts 02142 (US). **SHARPE, Michka Gabrielle**; c/o FLAGSHIP POINEERING INNOVATIONS VII, LLC, 55 Cambridge Parkway, 8th Floor, Suite 800E, Cambridge, Massachusetts 02142 (US). **SINGH, Aditya Sushil Kumar**; c/o FLAGSHIP POINEERING INNOVATIONS VII, LLC, 55 Cambridge Parkway, 8th Floor, Suite 800E, Cambridge, Massachusetts 02142 (US). **TRAN, Phu Tri**; c/o FLAGSHIP POINEERING INNOVATIONS VII, LLC, 55 Cambridge Parkway, 8th Floor, Suite 800E, Cambridge, Massachusetts 02142 (US).

(74) **Agent: ROMANO, Charles P.** et al.; McKee, Voorhees & Sease, P.L.C., 801 Grand Avenue, Suite 3200, Des Moines, Iowa 50309-2721 (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, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, 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, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, 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, ME, 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).

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

(88) **Date of publication of the international search report:**
 28 September 2023 (28.09.2023)