

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

(19) World Intellectual Property
Organization
International Bureau



(10) International Publication Number
WO 2022/204283 A1

(43) International Publication Date
29 September 2022 (29.09.2022)

(51) International Patent Classification:

C12N 15/80 (2006.01) C12N 9/78 (2006.01)
C12N 15/52 (2006.01) C12N 9/88 (2006.01)
C12N 9/00 (2006.01) C12P 17/12 (2006.01)

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))

(21) International Application Number:

PCT/US2022/021547

(22) International Filing Date:

23 March 2022 (23.03.2022)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/166,117 25 March 2021 (25.03.2021) US

(71) Applicant: **THE BOARD OF TRUSTEES OF THE LE-
LAND STANFORD JUNIOR UNIVERSITY** [US/US];
Office of the General Counsel, Building 170, 3rd
Floor, Main Quad, P.O. Box 20386, Stanford, California
94305-2038 (US).

(72) Inventors: **SMOLKE, Christina D.**; Shriram Cen-
ter, Room 237, 443 Via Ortega, Stanford, California
94305-2038 (US). **SRINIVASAN, Prashanth**; Shriram
Center, Room 237, 443 Via Ortega, Stanford, California
94305-2038 (US).

(74) Agent: **FIELD, Bret E.**; 201 Redwood Shores Parkway,
Suite 200, Redwood City, California 94065 (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: TROPANE ALKALOID TRANSPORTERS AND METHODS OF MAKING TROPANE ALKALOIDS USING THE
SAME

(57) Abstract: Provided herein, among other things, is an engineered non-plant cell that produces a tropane alkaloid product, a precursor
of a tropane alkaloid product, or a derivative of a tropane alkaloid product by means of a complement of biosynthetic enzymes and a
complement of transporter proteins. A method for producing a tropane alkaloid, a precursor of a tropane alkaloid product, or a derivative
of a tropane alkaloid product that makes use of the cell is also described.

WO 2022/204283 A1