



(51) International Patent Classification:
Not classified

(21) International Application Number:
PCT/US2021/025487

(22) International Filing Date:
02 April 2021 (02.04.2021)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
63/004,740 03 April 2020 (03.04.2020) US

(71) Applicant: **DUKE UNIVERSITY** [US/US]; 2812 Erwin Rd., STE 306, Durham, North Carolina 27709 (US).

(72) Inventors: **LYNCH, Michael David**; 402 Englewood Avenue, Durham, North Carolina 27701 (US). **LI, Shuai**; 2812 Erwin Road, Suite 306, Durham, North Carolina 27705 (US).

(74) Agent: **SHOEMAKER, Debra et al.**; 41 South High Street, Suite 2600, Columbus, Ohio 43215 (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, 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:

- without international search report and to be republished upon receipt of that report (Rule 48.2(g))
- with sequence listing part of description (Rule 5.2(a))

(54) Title: METHODS AND COMPOSITIONS FOR THE PRODUCTION OF XYLITOL FROM XYLOSE UTILIZING DYNAMIC METABOLIC CONTROL

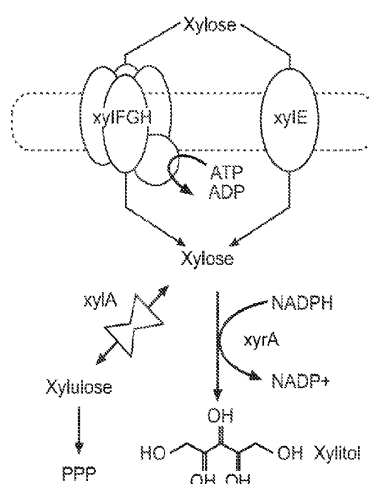


FIG. 1

(57) Abstract: The present disclosure is related to genetically engineered microbial strains and related bioprocesses for the production of xylitol. Specifically, the use of dynamically controlled synthetic metabolic valves to reduce the activity of certain enzymes, leads to increased xylitol production in a two-stage process.