

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
05 October 2023 (05.10.2023)



(10) International Publication Number
WO 2023/187214 A1

(51) International Patent Classification:

G16B 30/20 (2019.01) G16B 40/20 (2019.01)
G16B 35/10 (2019.01)

(21) International Application Number:

PCT/EP2023/058594

(22) International Filing Date:

31 March 2023 (31.03.2023)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/325,685 31 March 2022 (31.03.2022) US

(71) Applicant: **RIBBON BIOLABS GMBH** [AT/AT];
Viehmarktgasse 1B/EG, 1030 Vienna (AT).

(72) Inventors: **VLADAR, Harold P.**; Viehmarktgasse 1B/EG,
AT 1030 Vienna (AT). **AGOZZINO, Luca**; Viehmarkt-
gasse 1B/EG, AT 1030 Vienna (AT).

(74) Agent: **GRAHAM WATT & CO LLP**; St Botolph's
House, 7-9 St Botolph's Road, Sevenoaks Kent TN13 3AJ
(GB).

(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, MU, 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).

Published:

— with international search report (Art. 21(3))

(54) Title: BIOPOLYMER SYNTHESIS

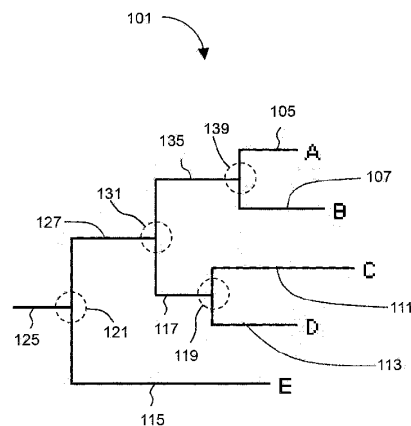


FIG. 1

(57) Abstract: The invention provides methods for synthesizing large biopolymers such as genome-scale polynucleotide molecules. Where genome-scale polynucleotides are to be made by attaching together a number of oligos, assembly of the desired polynucleotide from the oligos is represented as a tree, in which the branches represent nucleotide sequences and the nodes represent attachments between pairs of oligos. Numerous assembly trees are each generated and scored in silico according to how successful that tree will be in directing assembly of the desired polynucleotide, given biochemical properties of the oligos and proposed ligations. Systems and methods of the invention select a suitable tree and operate liquid handling systems to perform operations as shown by the selected tree to make the desired polynucleotide.

WO 2023/187214 A1