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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
18 September 2025 (18.09.2025)

WIPO | PCT

(10) International Publication Number
WO 2025/193170 A1

(51) International Patent Classification:
C08G 8/36 (2006.01) *A01P 1/00* (2006.01)
C08L 65/00 (2006.01) *A23B 99/00* (2025.01)
C07K 2/00 (2006.01) *A61K 47/56* (2017.01)
A01N 39/00 (2006.01) *A61K 47/55* (2017.01)
A01N 37/18 (2006.01)

(21) International Application Number:
PCT/SG2025/050181

(22) International Filing Date:
13 March 2025 (13.03.2025)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10202400700R 13 March 2024 (13.03.2024) SG

(71) Applicant: **AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH** [SG/SG]; 1 Fusionopolis Way, #20-10 Connexis North, Singapore 138632 (SG).

(72) Inventors: **CHEN, Feng**; c/o Institute of Sustainability for Chemicals, Energy and, Environment (ISCE2), 1 Pesek Rd, Singapore 627833 (SG). **LI, Xu**; c/o Institute of Sustainability for Chemicals, Energy and, Environment (ISCE2), 1 Pesek Rd, Singapore 627833 (SG). **WONG, Siew Yee**; c/o Institute of Sustainability for Chemicals, Energy and, Environment (ISCE2), 1 Pesek Rd, Singapore 627833 (SG). **SIM, Jia Yu**; c/o Institute of Sustainability for Chemicals, Energy and, Environment (ISCE2), 1 Pesek Rd, Singapore 627833 (SG). **ZHANG, Yu**; c/o Institute of Sustainability for Chemicals, Energy and, Environment (ISCE2), 1 Pesek Rd, Singapore 627833 (SG).

(74) Agent: **SPRUSON & FERGUSON (ASIA) PTE LTD**; 152 Beach Road, #37-05/06 Gateway East, Singapore 189721 (SG).

(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, UY, 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:
— *of inventorship (Rule 4.17(iv))*

Published:
— *with international search report (Art. 21(3))*
— *in black and white; the international application as filed contained color or greyscale and is available for download from PATENTSCOPE*

(54) Title: A POLYMER, A METHOD OF PREPARING THE POLYMER AND ITS USES THEREOF

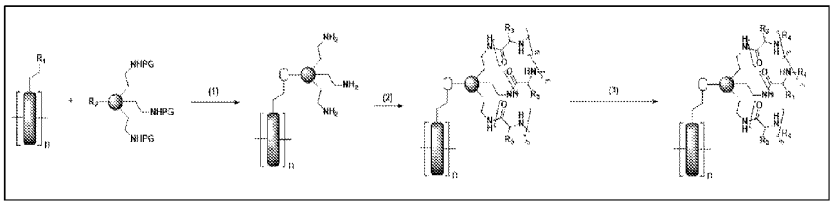

Fig. 1

(57) Abstract: The present disclosure relates to a topologically complex polymer comprising at least one functionalized macromolecule coupled to a plurality of antimicrobial peptides via a plurality of furcated linkers, wherein each antimicrobial peptide is bonded to each furcated terminal end of the furcated linker. The present disclosure also relates to a method of preparing the topologically complex polymer, a method of preparing a packaging material comprising the topologically complex polymer and a packaging material comprising the topologically complex polymer as defined herein.

WO 2025/193170 A1