

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
02 September 2021 (02.09.2021)



(10) International Publication Number
WO 2021/173624 A1

(51) International Patent Classification:

A61K 9/10 (2006.01) *A61K 31/245* (2006.01)
A61K 9/107 (2006.01) *A61K 31/445* (2006.01)
A61K 31/167 (2006.01) *A61K 47/10* (2017.01)

(21) International Application Number:

PCT/US2021/019354

(22) International Filing Date:

24 February 2021 (24.02.2021)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

62/981,273 25 February 2020 (25.02.2020) US

(71) Applicant: **THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL** [US/US]; 109 Church Street, Chapel Hill, NC 27516 (US).

(72) Inventors: **JAY, Michael**; UNC Eshelman School of Pharmacy, 301 Pharmacy Lane, CB#7355, Chapel Hill, NC 27599-7355 (US). **ZELDES, Ben**; UNC Eshelman School of Pharmacy, 301 Pharmacy Lane, CB#7355, Chapel Hill, NC 27599-7355 (US). **MARTIN, Jesse**; UNC Eshelman School of Pharmacy, 301 Pharmacy Lane, CB#7355, Chapel Hill, NC 27599-7355 (US). **MC MIL-**

LAN, Stephen; UNC Eshelman School of Pharmacy, 301 Pharmacy Lane, CB#7355, Chapel Hill, NC 27599-7355 (US).

(74) Agent: **WIMBISH, J., Clinton**; Nexsen Pruet, PLLC, 227 West Trade Street, Suite 1550, Charlotte, NC 28202 (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,

(54) Title: EUTECTIC BASED ANESTHETIC COMPOSITIONS AND APPLICATIONS THEREOF

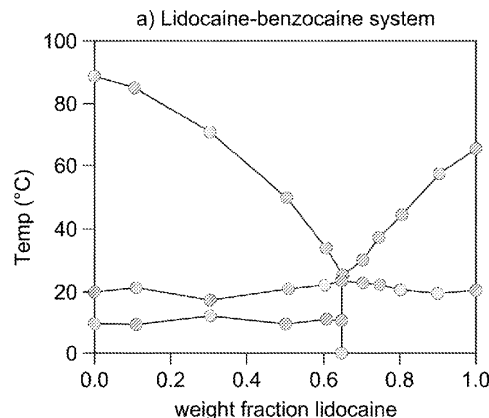


FIG. 2A

(57) Abstract: In view of the health and addiction risks associated with opiates, anesthetic emulsions are described herein comprising eutectic mixtures of local anesthetics. In some embodiments, the anesthetic emulsions release one or more local anesthetics over a period of several days for continuous pain relief. An anesthetic emulsion, in some embodiments, comprises a dispersed phase comprising a eutectic mixture of lidocaine and benzocaine, and an aqueous or aqueous-based continuous phase comprising bupivacaine.

[Continued on next page]

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))*