

CORRECTED VERSION

(19) World Intellectual Property
Organization
International Bureau



WIPO | PCT



(10) International Publication Number
WO 2013/036383 A8

(43) International Publication Date
14 March 2013 (14.03.2013)

(51) International Patent Classification:

A61K 38/42 (2006.01) *A61K 47/30* (2006.01)
A61K 9/20 (2006.01) *A61K 47/48* (2006.01)
A61K 9/16 (2006.01)

(21) International Application Number:

PCT/US2012/051960

(22) International Filing Date:

23 August 2012 (23.08.2012)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/531,224 6 September 2011 (06.09.2011) US

(72) Inventors; and

(71) Applicants : **WONG, Bing Lou** [US/US]; 3592 S. Mall
Street, Irvine, CA 92606 (US). **KWOK, Sui Yi** [CN/CN];
Flat 2907, 29/f, Pik Wai House, Shek Pai Wan Estate, Ab-
erdein, Hong Kong (CN).

(74) Agent: **YIP, Sam, T.**; Ella Cheong (Hong Kong) Limited,
5001 Hopewell Centre, 183 Queen's Road East, Wan Chai,
Hong Kong (CN).

(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, DK, DM,
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP,

KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD,
ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI,
NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW,
SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, 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, 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,
ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a
patent (Rule 4.17(ii))*
- *of inventorship (Rule 4.17(iv))*

Published:

- *with international search report (Art. 21(3))*

(48) Date of publication of this corrected version:

27 March 2014

(15) Information about Correction:

see Notice of 27 March 2014

(54) Title: ORAL DELIVERY FOR HEMOGLOBIN BASED OXYGEN CARRIERS

(57) Abstract: A process for making hemoglobin based oxygen carrier (HBOC) containing pharmaceutical composition suitable for oral delivery and the composition formed thereby are described. There are three exemplary composition configurations which include (1) hemoglobin-loaded nanoparticles solution, (2) enteric-coated hemoglobin capsules and (3) enteric-coated hemoglobin tablets. To facilitate the bioavailability and bio-compatibility of hemoglobin, intestinal absorption enhancers are added in each of the HBOC formulations. Protective layers ensure delivery of an intact hemoglobin structure in intestinal tract without degradation in the stomach. The HBOC formulations may be used for preventive or immediate treatment of high altitude syndrome (HAS) or for treatment of hypoxic conditions including blood loss, anemia, hypoxic cancerous tissue, and other oxygen-deprivation disorders. In addition to delivering oxygen, the heme group of hemoglobin from HBOC formulations can provide heme iron to the human body to aid in the production of more red blood cells.



WO 2013/036383 A8