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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
16 January 2014 (16.01.2014)

WIPO | PCT

(10) International Publication Number
WO 2014/011819 A2

(51) International Patent Classification:
C07K 14/755 (2006.01)

(21) International Application Number:
PCT/US2013/049989

(22) International Filing Date:
10 July 2013 (10.07.2013)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

61/670,401	11 July 2012 (11.07.2012)	US
61/759,819	1 February 2013 (01.02.2013)	US
61/801,504	15 March 2013 (15.03.2013)	US
61/801,544	15 March 2013 (15.03.2013)	US
61/827,158	24 May 2013 (24.05.2013)	US
61/840,811	28 June 2013 (28.06.2013)	US

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(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, 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, PA, 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, 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))*

WO 2014/011819 A2

(54) Title: FACTOR VIII COMPLEX WITH XTEN AND VON WILLEBRAND FACTOR PROTEIN, AND USES THEREOF

(57) Abstract: The present invention provides a chimeric protein comprising a VWF protein comprising the D' domain and D3 domain of VWF, one or more XTEN sequence, and a FVIII protein, wherein the VWF fragment, the XTEN sequence, or the FVIII protein are linked to or associated with each other. The chimeric protein can further comprise one or more Ig constant region or a portion thereof (e.g., an Fc region). A polypeptide chain comprising a VWF fragment of the invention binds to or is associated with a polypeptide chain comprising a FVIII protein linked to an XTEN sequence and the polypeptide chain comprising the VWF fragment can prevent or inhibit binding of endogenous VWF to the FVIII protein linked to the XTEN sequence. By preventing or inhibiting binding of endogenous VWF to the FVIII protein, which is a half-life limiting factor for FVIII, the VWF fragment can induce extension of half-life of the chimeric protein comprising a FVIII protein. The invention also includes nucleotides, vectors, host cells, methods of using the VWF fragment, or the chimeric proteins.