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

CORRECTED VERSION

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
19 June 2014 (19.06.2014)

WIPO | PCT

(10) International Publication Number
WO 2014/093635 A9

(51) International Patent Classification:
C12N 15/63 (2006.01)

(21) International Application Number:
PCT/US2013/074691

(22) International Filing Date:
12 December 2013 (12.12.2013)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

61/736,527	12 December 2012 (12.12.2012)	US
61/748,427	2 January 2013 (02.01.2013)	US
61/758,468	30 January 2013 (30.01.2013)	US
61/769,046	25 February 2013 (25.02.2013)	US
61/802,174	15 March 2013 (15.03.2013)	US
61/791,409	15 March 2013 (15.03.2013)	US
61/806,375	28 March 2013 (28.03.2013)	US
61/814,263	20 April 2013 (20.04.2013)	US
61/819,803	6 May 2013 (06.05.2013)	US
61/828,130	28 May 2013 (28.05.2013)	US
61/835,931	17 June 2013 (17.06.2013)	US
61/836,101	17 June 2013 (17.06.2013)	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, IR, 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, SA, 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:

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

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

[Continued on next page]

(54) Title: ENGINEERING AND OPTIMIZATION OF IMPROVED SYSTEMS, METHODS AND ENZYME COMPOSITIONS FOR SEQUENCE MANIPULATION

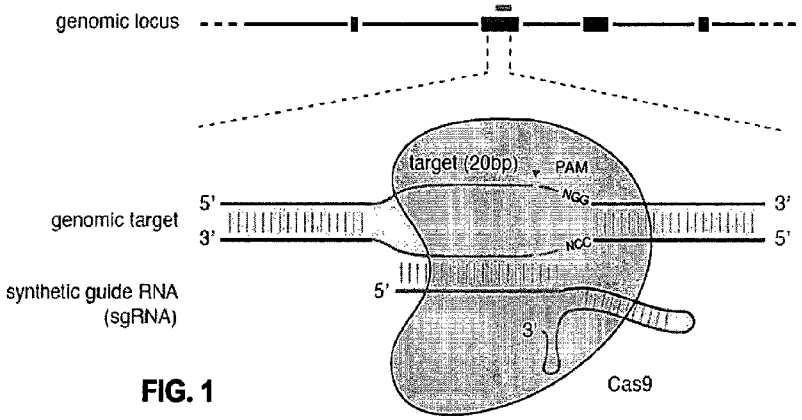


FIG. 1

(57) Abstract: The invention provides for engineering and optimization of systems, methods, and compositions for manipulation of sequences and/or activities of target sequences. Provided are compositions and methods related to components of a CRISPR complex particularly comprising a Cas ortholog enzyme.

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(48) **Date of publication of this corrected version**:
24 July 2014

(15) **Information about Correction**:
see Notice of 24 July 2014