



(51) International Patent Classification:

*A61K 39/102* (2006.01) *G01N 33/569* (2006.01)  
*C07K 19/00* (2006.01) *A61K 39/00* (2006.01)  
*C07K 14/285* (2006.01) *A61K 38/00* (2006.01)  
*C12N 15/63* (2006.01)

(21) International Application Number:

PCT/EP2013/058459

(22) International Filing Date:

24 April 2013 (24.04.2013)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

1207385.4 26 April 2012 (26.04.2012) GB  
12199079.0 21 December 2012 (21.12.2012) EP

(71) Applicant: **NOVARTIS AG** [CH/CH]; Lichtstrasse 35,  
CH-4056 Basel (CH).

(72) Inventors: **SORIANI, Marco**; Novartis Vaccines and Diagnostics SrL, Via Fiorentina 1, I-53100 Siena (IT). **SCARSELLI, Maria**; Novartis Vaccines and Diagnostics SrL, Via Fiorentina 1, I-53100 Siena (IT). **NORAIS, Nathalie**; Novartis Vaccines and Diagnostics SrL, Via Fiorentina 1, I-53100 Siena (IT). **GOMES MORIEL, Danilo**; Novartis Vaccines and Diagnostics SrL, Via Fiorentina 1, I-53100 Siena (IT). **ROSSI PACCANI, Silvia**; Novartis Vaccines and Diagnostics SrL, Via Fiorentina 1, I-53100 Siena (IT).

(74) Agents: **COURGEON, Antoine** et al.; Novartis Vaccines and Diagnostics SrL, Via Fiorentina 1, I-53100 Siena (IT).

(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, 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, 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))
- with sequence listing part of description (Rule 5.2(a))

(88) Date of publication of the international search report:

10 April 2014

(54) Title: ANTIGENS AND ANTIGEN COMBINATIONS

(57) Abstract: NTHI protein antigens have been identified and found to be conserved across several *Haemophilus influenzae* pathogenic strains. They have been isolated, cloned from a reference strain and tested for immunogenicity. Methods for immunization and vaccines derived thereof are also disclosed.

