



PCR algorithm to detect and characterize *Neisseria meningitidis* carriage isolates in the African meningitis belt [↗](#)

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[Olivier Manigart](#)¹

¹London School of Hygiene and Tropical Medicine

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[Olivier Manigart](#)

ABSTRACT

Improved methods for the detection and characterization of carried *Neisseria meningitidis* isolates are needed. We evaluated a multiplex PCR algorithm for the detection of a variety of carriage strains in the meningitis belt. To further improve the sensitivity and specificity of the existing PCR assays, primers for gel-based PCR assays (sodC, H, Z) and primers/probe for real-time quantitative PCR (qPCR) assays (porA, cni, sodC, H, E, Z) were modified or created using Primer Express software. Optimized multiplex PCR assays were tested on 247 well-characterised carriage isolates from six countries of the African meningitis belt. The PCR algorithm developed enabled the detection of *N. meningitidis* species using gel-based and real-time multiplex PCR targeting porA, sodC, cni and characterization of capsule genes through sequential multiplex PCR assays for genogroups (A, W, X, then B, C, Y and finally H, E and Z). Targeting both porA and sodC genes together allowed the detection of meningococci with a sensitivity of 96% and 89% and a specificity of 78% and 67%, for qPCR and gel-based PCR respectively. The sensitivity and specificity ranges for capsular genogrouping of *N. meningitidis* are 67% - 100% and 98%-100% respectively for gel-based PCR and 90%-100% and 99%-100% for qPCR. We developed a PCR algorithm that allows simple, rapid and systematic detection and characterisation of most major and minor *N. meningitidis* capsular groups, including uncommon capsular groups (H, E, Z).

EXTERNAL LINK

<http://www.lshtm.ac.uk/aboutus/people/manigart.olivier> ; <https://www.linkedin.com/in/olivier-manigart-699a7861/>

THIS PROTOCOL ACCOMPANIES THE FOLLOWING PUBLICATION

Diallo K, Coulibaly MD, Rebbetts LS, Harrison OB, Lucidarme J, Gamougam K, Tekletsion YK, Bugri A, Toure A, Issaka B, Dieng M, Trotter C, Collard J, Sow SO, Wang X, Mayer LW, Borrow R, Greenwood BM, Maiden MCJ, Manigart O, ftMC (2018) Development of a PCR algorithm to detect and characterize *Neisseria meningitidis* carriage isolates in the African meningitis belt. PLoS ONE 13(12): e0206453. doi: [10.1371/journal.pone.0206453](https://doi.org/10.1371/journal.pone.0206453)

Meningococcal
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PROTOCOL STATUS

Working

1

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