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Update on the *Neisseria lactamica* challenge model
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At a population level, carriage of *Neisseria lactamica* has an inverse relationship with meningococcal disease, suggesting that *N.lactamica* carriage is associated with natural protection. Intranasal inoculation of adult volunteers with *Neisseria lactamica* results in stable colonisation for at least 6 months in most colonised individuals. This event leads to an expansion of antigen-specific B cells together with a serological response to *N.lactamica*. We previously showed that induction of *N.lactamica* carriage in University students reduces acquisition of *N.meningitidis* over the course of the University term, and also displaces existing *N.meningitidis* carriage. Inoculation of *N.lactamica* does not induce serum bactericidal antibody responses against *N.meningitidis* but recent work has used B cell ELLISPOT to demonstrate expansion of peripheral blood B cells cross reactive with *N.meningitidis*. Genome sequencing reveals that during colonization of the human nasopharynx, the *N.lactamica* genome is very stable but adapts *ad hominem* mainly via the mechanism of phase variation. We have recently genetically modified *N.lactamica* to express the meningococcal antigen NadA, and shown that volunteers can be inoculated safely with this GMO. For future use of *N.lactamica*, either as an experimental tool, or as a potential `bacteria medicine`, lyophilisation provides a means to conveniently prepare and distribute inocula. We have shown that reconstituted lyophilised *N.lactamica* elicits colonisation kinetics that are equivalent to frozen stock. This will be an important step toward future studies in the field.