

Phase Variation of Class 1 outer Membrane Protein in *Neisseria meningitidis*

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The class 1 outer membrane protein code by the *porA* gene of *Neisseria meningitidis*, is a vaccine candidate against this pathogen. The expression of class 1 outer membrane protein displays phase variation between three expression levels.

Analysis by PCR showed two classes of class 1 protein phase variants; one with an intact *porA* gene and the other with the *porA* gene completely absent. Analysis of the *porA* specific transcripts of the first class of phase variants by Northern hybridization showed that these phase variants are modulated at the transcriptional level. The start site for transcription is located 59 base pairs upstream of the translational initiation codon. Sequence analysis the DNA region upstream of the coding region of the *porA* gene, revealed a poly G tract in the spacer between the -10 and -35 sequence of its promoter. Comparison of promoter sequences of different phase variants showed that the length of the poly G tract can be correlated with the expression level of the class 1 outer membrane protein. These results show that the transcription of *porA* gene is modulated by slipped strand mispairing of a poly G stretch within the intervening sequence of the -35 and -10 regions of its promoter. Sequence analysis of the DNA region upstream and downstream the *porA* gene also revealed regions with extensive homology at either side of the gene. The deletion of the *porA* gene of the second class of phase variants comprised the region between these sequences of extensive homology. From these data we suggest that the *porA* gene can be deleted by homologous recombination. The phase variation of class 1 outer membrane protein may provide a molecular mechanism to evade the host immune defence.

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