

Poster Presentation

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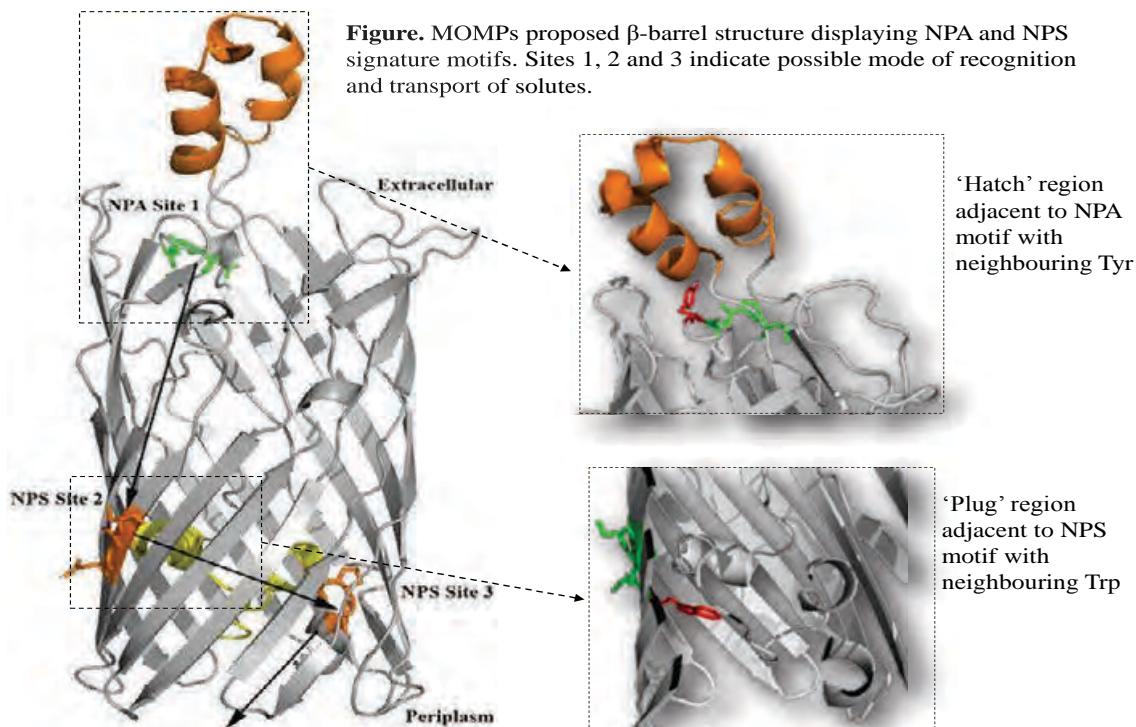
Structure-function characterisation of *Chlamydomophila pneumoniae* MOMP

F. Atanu¹, A. Danson¹, K. Watson¹

¹School of Biological Sciences, University of Reading, Reading, UK

The major outer membrane protein (MOMP) from *Chlamydomophila pneumoniae* is a promising candidate antigen for chlamydomophila vaccine development. MOMP is a 40kDa protein, encoded by the gene *omp1*, accountable for 60% of the total outer membrane mass of *Chlamydomophila pneumoniae*. 2-3% of all Gram negative genomes encode for this particular protein class (porins), emphasising its importance and fueling intensive research into MOMP's structure and function. Our particular interest is in the established link between human infection, by micro-organisms such as *Chlamydomophila pneumoniae*, and atherosclerosis – a multifactorial killer disease in developed nations. Evidence suggests a role for purified MOMP and corresponding MOMP-derived peptides in immune-modulation, leading to a reduced atherosclerotic phenotype in apoE^{-/-} mice through dampening of MHC class II activity. We have used bioinformatics, SRCD and FTIR spectroscopies, and electrophysiology to reveal details of the structure, stability and function of MOMP. Our research to date demonstrates MOMP as a beta-barrel membrane protein containing putative 'hatch' and 'plug' domain helices, which may have implications in its function as a porin. Additionally, we show that MOMP exhibits significant increased thermal stability in the presence of fatty acids, highlighting a role for key 'NPA' and 'NPS' signature motifs present in MOMP in the transport of solutes. Our results proffer solutions to the long standing bottleneck in recombinant production of *Chlamydomophila* MOMP's and their functional characterisation. This work has promising implications for structure-driven vaccine design against Chlamydial related diseases.

[1] Bermudez-Fajardo A, Stark AK, El-Kadri R, et al. (2011) The effect of *Chlamydomophila pneumoniae* Major Outer Membrane Protein (MOMP) on macrophage and T cell-mediated immune responses, *Immunobiology* 16(1-2):152-63., [2] Atanu F., Oviedo-Orta E., and Watson K. (2013), A Novel Transport Mechanism for MOMP in *Chlamydomophila pneumoniae* and Its Putative Role in Immune-Therapy, *PLoS One*. 8(4): e61139.



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