

Variation of Sequence of Genes Encoding the *MurMN* Operon and Cell Wall Composition in *Streptococcus pneumoniae* Strains of Different Susceptibility Levels to Penicillin

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ABSTRACT

It has been reported that there are structural differences in the muropeptides of the cell wall in penicillin-resistant *Streptococcus pneumoniae*. The cell wall composition and variation of the *murMN* operon sequence of *S. pneumoniae* strains with different penicillin susceptibilities were investigated. PCR amplification and sequencing of the *murM* and *murN* genes were carried out on three selected strains of *S. pneumoniae*. The cell wall was then extracted and elucidated using Fourier Transfer InfraRed (FTIR) Spectroscopy, followed by proton Nuclear Magnetic Resonance (NMR) Spectroscopy. The sequences of the *murM* and *murN* genes were shown to be highly conserved while FTIR and NMR analysis suggested a branching structure of the cell wall and also the presence of ethanolamine in the resistant strain. The variations in *murM* and *murN* genes may have caused modifications in the cell wall structure leading to decreased binding capacity of penicillins and other β -lactam drugs. (*J Infect Dis Antimicrob Agents* 2009;26:97-108.)