

## **Chlamydia Diagnostics and Issues of Treatment Failure / Antimicrobial Resistance**

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*Chlamydia trachomatis* is an obligate intracellular pathogen with approximately 131 million cases of sexually transmitted infection each year. Recently, using a cohort study design the investigators on the Australian Chlamydia Treatment Study have identified that more women than originally thought fail to resolve the infection after treatment with azithromycin. The isolates have been cultured and characterised and after culture no evidence of a higher MIC to azithromycin was detected. However, using a specialised approach to capture and sequence the chlamydial DNA from cervix swabs rather than culturing, analysis and immediate culture in the presence of azithromycin from the swab suggests that the *in vivo* chlamydial population is more dynamic and distinct than what we can culture in the laboratory. The possible role of chlamydial persistence, specific genomic loci in members of the population and population dynamics all appear to differ in the *Chlamydia* from the women who failed treatment compared to women who resolved the infection after azithromycin treatment. Here, we will present the first genomic analysis of chlamydia in women who failed treatment, and the first characterisation of persistence and growth phenotypes of isolates associated with treatment failure and present our model for how treatment failure occurs in *Chlamydia*.