Targeting a protease to understand and better treat the diseases caused by Chlamydia; from humans to Koalas.

Dr Willa Huston, School of Life Sciences, University of Technology Sydney

*Chlamydia* are unique obligate intracellular pathogens that infect a range of animal hosts, from being the most common bacterial sexually transmitted infection in humans worldwide to causing blindness and infertility in koalas. Our research has uncovered the function of a serine protease (HtrA) for the pathogenesis of *Chlamydia*. The work demonstrated that it is a serine protease and chaperone that likely functions in the cell envelope of *Chlamydia* for protein assembly, maintenance, and degradation during stress response. CtHtrA was found to be essential growth by the identification and application of a protease inhibitor (called JO146). Most recently new work to isolate and characterise mutants with resistance to JO146 by the generation of an EMS mutation library in *C. trachomatis* strain D has been successful. This work identified a possible role membrane protein stability further linking CtHtrA. The inhibitor has been further developed and implemented against a range of animal isolates including Chlamydia from Koalas where new treatments are urgently needed.

Bio

Dr Wilhelmina (Willa) Huston

Senior Lecturer and Research Group Leader

Chlamydia research team

School of Life Sciences, University of Technology Sydney.

Dr Willa Huston is a Senior Lecturer and research group leader at the School of Life Sciences, University of Technology Sydney. Her research is focussed on molecular microbiology of the intracellular pathogen Chlamydia, particularly how proteases function in the organism’s pathogenesis. She is especially interested in research into infectious diseases cause human diseases such as infertility and PID in women. Her Research has been funded by NHMRC and ARC Linkage funding and most recently they have uncovered an essential role for the protease HtrA in the replicative phase of chlamydial development. This was the first successful application of chemical inhibition to demonstrate an essential chlamydial protease. The potential application of this molecule as a new drug is the current focus of the research.