

## **Honours projects in** **Stress Response in Pathogenic Bacteria:**

All pathogenic bacteria need specialized mechanisms to adapt to the conditions as well as the changing conditions in the different anatomical niches in which they inhabit and cause disease. Many of these conditions are non-optimal and create a stress on the bacteria. In addition the host generates numerous reactive chemicals as an anti-microbial process. The work in our lab aims to study the particular pathways important in this adaptation and which are unique to specific pathogenic bacteria. We have projects on various pathogens. Our work generally is focussed on using molecular biology to understand the transcriptional and metabolic pathways which are important to the bacterial stress response. Some of our projects are:

### ***Haemophilus influenzae:***

A large part of our work is looking at the molecular biology of various strains of *H. influenzae* and trying to understand the elements of its behaviour and lifestyle which varies between its commensal and pathogen states.

### **Group B Strep:**

We have a project which aims to identify the response of Group B Streptococcus to relevant reactive oxygen and reactive nitrogen species.

### ***Staphylococcus aureus:***

We have a set of clinical isolates of *S. aureus* collected from various disease outcomes and we have data which shows there are significant lifestyle variations between these strains when assaulted with stresses relevant to the host-pathogen environment.

### **Mixed colony biofilms.**

Biofilms have largely been studied as a singular species-type when physiologically bacteria exist in a mixed population. An interesting addition to the bacterial response to the physical and chemical conditions and stresses of its environment is the biological variations; that is the other bacteria present.