Uncovering the Transcriptional Regulation of ClpC During Sporulation in *Bacillus subtilis*

Student name: Simosenkosi Nkomboni
Project advisor: Amy Camp

ClpC is an AAA+ ATPase chaperone/unfoldase that interacts with the ClpP protease during proteolysis in the gram-positive bacterium *Bacillus subtilis*. ClpC has additional roles in sporulation, cell competence, cell division and degradative enzyme production. ClpC, while present during normal growth, is known to be produced in high quantities under stressful conditions to degrade protein aggregates. It has been shown previously that ClpCP preferentially localizes to the forespore during sporulation and functions to degrade proteins. However, very little is known about the spatial and temporal regulation of ClpC. A number of putative promoters have been suggested by *in silico* predictive analyses, but no specific transcriptional regulators have been defined to date. We here present evidence that ClpC is part of a complex regulatory network involving multiple alternative sigma factors. Our results suggest that ClpC is at least partially under control of $\sigma^H$, prior to entry into sporulation. This work not only tells us how ClpC is specifically regulated in *B subtilis* during sporulation, it also contributes to our general understanding of the spatial, temporal, and developmental control of proteolysis in prokaryotes.