Project 2

Title: Interdependency between pyrimidine metabolism and the production of a virulence factor in the human pathogen Streptococcus pneumoniae

Supervisor: Ana Rute Neves, ITQB/UNL

Host laboratory: Lactic Acid Bacteria & in vivo NMR

Short description:

Streptococcus pneumoniae is a major human pathogen that causes serious diseases, such as pneumonia, bacteremia, and meningitis. This organism produces a polysaccharide capsule, which is a major virulence factor essential for systemic virulence. Indeed, strains devoid of capsule are avirulent. We have selected a S. pneumoniae strain that shows defective capsule production. This defect can be compensated by addition of pyrimidines to the growth medium. In this project, we aim at unraveling the underlying molecular mechanism leading to a capsuleless derivative. We will perform whole transcriptome analysis to compare gene expression in wild-type and the defective mutant, in the presence and absence of pyrimidines. In this way, we expect to identify targets required for capsule formation in the absence of pyrimidine. We will sequence chromosomal regions neighboring potentially involved genes. Lastly, directed mutations will be introduced in wild-type S. pneumoniae to validate our targets. This work is in line with that of an FCT funded project PTDC/BIA-MIC/099963/2008.

Duration: 1 year.