The role of peptidoglycan remodelling in \textit{Listeria monocytogenes} persistence

Application deadline: Applications accepted all year round

Supervisor/s: Dr Galina Mukamolova and Professor Peter Andrew

Email: gvm4@le.ac.uk

Funding: Self-funding only

Summary (max 200 words)

\textit{Listeria monocytogenes} is the major foodborne pathogen, mainly affecting pregnant women, neonates and immunocompromised individuals. The bacterium can cause a wide range of diseases, from mild enteritis to severe septicemia. According to the Food Standard Agency \textit{L. monocytogenes} causes more deaths each year than \textit{Salmonella} and \textit{E. coli 0157} combined.

\textit{Listeria} can survive unfavourable conditions and replicate at low temperature, forming biofilm on almost all surface materials found in food processing environments. \textit{L. monocytogenes} is also resistant to many disinfectants and it can persist in environment for years without division, suggesting the existence of specialised dormant forms and their importance for distribution of this bacterium.

While many surface proteins have been shown to be critical for \textit{Listeria} infections, the importance of peptidoglycan modification in \textit{Listeria} virulence, biofilm formation and stress tolerance has not been directly addressed.

The proposed project is aimed to investigate the role of muralytic enzymes (lytic transglycosylases) in \textit{L. monocytogenes} persistence \textit{in vivo} and \textit{in vitro}, including biofilm formation on stainless steels. The project will involve generation of \textit{L. monocytogenes} mutants and characterisation of their phenotypes in stress resistance, survival in macrophages and oral mouse infection; analysis of peptidoglycan modifications; application of fluorescence and confocal microscopy.