

Moyne Seminar Series 2025 {13th February}

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Bio: The overarching goal of our research is to uncover the mechanisms underlying how pathogenic *Escherichia coli* are capable of infecting different sites of the human body - such as the gut, urinary tract and bloodstream. Pathogenic strains of *E. coli* employ numerous virulence and fitness enhancing factors to achieve this. These factors are often encoded on horizontally acquired genomic islands and must be precisely regulated in response to host or microbiota-derived cues, given that they dictate the ability to colonise distinct body sites. In addition, virulence and fitness enhancing proteins that have unrelated functions can be co-ordinately regulated by single transcription factors to prioritise their timely expression and promote fitness within the host.

Our research focuses on this level of regulation, and we use a combination of classical molecular microbiology, transcriptomics and animal models to address three key questions: (1) How do site-specific pathogens uniquely regulate gene expression at the host interface? (2) How does this regulation enhance colonisation capacity? (3) How are transcription factors repurposed to control this level of regulation?

For more information about our work please follow these links:

Newcastle webpage: <https://www.ncl.ac.uk/medical-sciences/people/profile/jamesconnolly2.html>

Publications: <https://pubmed.ncbi.nlm.nih.gov/?term=james+p+r+connolly%5BAuthor%5D&sort=date>

Talk Title: Regulatory flexibility as a driver of niche-specific *Escherichia coli* pathogenesis