

David Lee PhD

Teaching and Research Fellow

[School of Biosciences \(/schools/biosciences/index.aspx\)](/schools/biosciences/index.aspx)

Contact details

Telephone **+44 (0)121 414 5439** (tel:+44 121 414 5439)

Email **d.lee@bham.ac.uk** (mailto:d.lee@bham.ac.uk)

Twitter **[DaveScientist](http://twitter.com/DaveScientist)** (<http://twitter.com/DaveScientist>)

School of Biosciences
University of Birmingham
Edgbaston
Birmingham
B15 2TT
UK



About

Dr Lee's research focuses on the regulation of gene expression in bacteria, with particular interest in understanding how the organized bacterial chromosome impacts on, and is impacted by, transcription events. In addition, he is interested in how horizontally acquired genes, particularly transcription factors, impact upon gene expression.

Qualifications

BSc (University of Birmingham)
PhD (University of Birmingham)

Biography

David graduated from the University of Birmingham with a degree in Biochemistry in 1996. Keen to pursue a career in research he joined Steve Busby's research group in the School of Biosciences, studying the biochemical mechanisms by which bacteria adapt to growth without oxygen, and completed his PhD in 2000. Eager to stay and improve on his Birmingham accent, David has since developed several independent research streams and novel technologies in the field of bacterial genetics. In 2011, David was appointed as a Teaching and Research Fellow in the School of Biosciences.

Teaching

Undergraduate Year 2:

- Lectures and Practical - Bacterial Genetics BIO265

MSc:

- Practical Applications of Molecular Biotechnology BIOM12
- Core Concepts and Skills in Microbiology BIOM21

Final year undergraduate, MRes and MSc research projects

Postgraduate supervision

PhD studentships are awarded each year competitively within the School of Biosciences. Funding options are also available for international students including a studentship from the Darwin Trust of Edinburgh.

David is always keen to discuss projects with potential candidates – please contact him directly.

Research

Research theme within the School of Biosciences: **[Microbiology and Infection \(/research/activity/microbiology-infection/index.aspx\)](/research/activity/microbiology-infection/index.aspx)**

The Bacterial Chromosome and Gene Regulation

The length of a bacterial chromosome far exceeds the length of the cell. To accommodate it, bacteria use a number of physical mechanisms to organize, fold and compact the chromosome. Typically, the chromosome occupies the majority of the intercellular space, and the highly compacted nature means that some regions are accessible, and some regions are buried. How this organization impacts upon gene regulation is a major focus in my laboratory and we are using a combination of molecular microbiological, proteomic and ChIP technologies to ascertain how different genes, at different locations within the cell, are accessed by the transcription machinery.

The Impact of Horizontally Acquired DNA

Horizontal gene transfer accounts for the vast majority of emerging antibiotic resistance in bacteria. Of particular interest in my laboratory is the acquisition of large conjugative plasmids, which carry resistance to multiple antibiotics. We are investigating the impact of transcription factors carried on these plasmids on the host transcriptome.

Other activities

David engages with the public and peers on scientific topics through social media outlets such as **Twitter** (<https://twitter.com/DaveScientist>) and **Research Gate** (https://www.researchgate.net/profile/David_Lee30/). He established and is a regular contributor to a **weblog** (<http://imibirmingham.wordpress.com/>) and a **Twitter** (https://twitter.com/IMI_Birmingham) feed for the Institute of Microbiology and Infection (IMI), at the University of Birmingham.

David is co-organiser of the IMI summer school: a week long course providing year 12/13 A-level students with the opportunity to get hands-on practical experience of Microbiology at the University of Birmingham.

Bingle LE, Constantinidou C, Shaw RK, Islam MS, Patel M, Snyder LA, **Lee DJ**, Penn CW, Busby SJ, Pallen MJ. (2014) **Microarray Analysis of the Ler Regulon in Enteropathogenic and Enterohaemorrhagic Escherichia coli Strains.** (<http://www.ncbi.nlm.nih.gov/pubmed/24454682>) *PLoS One*. PMID:24454682

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Sánchez-Romero MA, **Lee DJ**, Sánchez-Morán E, Busby SJ. (2012) **Location and dynamics of an active promoter in Escherichia coli K-12.** (<http://www.ncbi.nlm.nih.gov/pubmed/21936772>) *Biochem J*. PMID 21936772

