

London calling: The 5th UK Cellular Microbiology Network Meeting

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The UK Cellular Microbiology Network Meeting started in 2019 with the vision of supporting and enhancing the cellular microbiology community in the UK and Europe. Since its inception, the network meeting has emerged as an important platform for infection and cell biologists to inspire transformative collaborations and novel research agendas. The network meeting is highly interactive and is focused on promoting early career researchers and discovery science. The fifth meeting in this series was held on 19–20 June 2023 at the iconic London School of Hygiene & Tropical Medicine (LSHTM).

Similar to the 2022 event held in Warwick (<https://onlinelibrary.wiley.com/doi/10.1111/mmi.0040011>), the meeting was spread over 2 days so that participants could maximise the dynamic science and downtown location. To represent the ethos of our community, our invited speakers were Pascale Cossart (from Institut Pasteur in Paris, France) and Felix Randow (from MRC LMB in Cambridge, UK). We also had a strong cohort of early career researchers from across the UK and Europe who presented their work (Figure 1).

Following coffee and welcoming remarks from Serge Mostowy (LSHTM), the meeting opened with a keynote talk by Pascale Cossart entitled 'How to give birth to a star', showcasing the rise of *Listeria* as a paradigm of cellular microbiology (Cossart, 2023) and her highly decorated career which was recently celebrated in the two joined *Cellular Microbiology* and *Molecular Microbiology* Special Issues (Buchrieser, 2020; Pizarro-Cerda, 2020). Pascale talked about her career-spanning body of work, including the discovery of ActA for

actin-based motility, the generation of the first humanised mouse model to study *Listeria* invasion, and the uncovering of numerous transformative mechanisms underlying bacterial virulence. All participants were inspired to hear about her enthusiasm for discovery science, and her vision for cellular microbiology moving forward. Although the field is blooming more than ever, she advised that future generations need to think about infection in the context of evolution and the environment—in other words, the context in which it is happening.

The first session was chaired by Serge Mostowy (LSHTM) and Dan Humphreys (Sheffield). Giulia Manigrasso (from Andrew Carter's lab, MRC LMB) presented her work on *Orientia tsutsugamushi* (in collaboration with Jeanne Salje's lab, CIMR) and how this obligate intracellular pathogen hijacks dynein motility for intracellular transport and autophagy evasion. The next talk was from Samkeliso Lisa Blundell (from David Holden's lab, Imperial College London), describing the *Salmonella* effector SteD as a co-activator of the E3 ubiquitin ligase WWP2. The last talk of this session was Miguel Hernandez-Gonzalez (from Michael Way's lab, Francis Crick), who is imaging poxvirus assembly and exit from infected cells using state-of-the-art microscopy techniques, including cryo-electron tomography (Hernandez-Gonzalez et al., 2023).

The next session was chaired by Phil Elks (Sheffield) and began with Margarida Gomes (from Serge Mostowy's lab, LSHTM), who is using zebrafish infection models to decipher mechanisms underlying

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FIGURE 1 Group photo.

trained innate immunity and to guide vaccine studies against shigellosis (Gomes et al., 2023). Next was Thomas Burgess (from Phil Elks' lab, Sheffield) who is also using zebrafish infection models, aiming to boost the innate immune response to infection by the fungal pathogen *Candida albicans* via modulation of hypoxia-inducible factor (HIF). Following this was Guy Pearson (from Jeremy Carlton's lab, Francis Crick and Kings College London), highlighting a wide variety of advanced imaging technologies as he described how the envelope of SARS-CoV-2 (the causative agent of COVID) hijacks an intracellular trafficking pathway to deacidify lysosomes.

This session was followed by flash talks selected from submitted abstracts by early career researchers. Gizem Ozbaykal-Guler (from Serge Mostowy's lab, LSHTM) presented interdisciplinary work testing the role of septin hetero-oligomer composition on cage entrapment of *Shigella*. Keith Egger (from Charlotte Odendall's lab, Kings College London) discussed work on *Salmonella* Type III Secretion System (T3SS) SPI-2 effectors and their role in inhibition of interferon signalling. Ines Diaz del Olmo (from Teresa Thurston's lab, Imperial College London) described how *Salmonella* could promote non-canonical reprogramming of transcriptional pathways; Shan Yin (from James Mason's lab, Kings College London) presented studies of symbioses between bacterial vaginosis-associated bacteria and lactobacilli. Daniel Stark (from Jason King's lab, Sheffield) reported on work using zebrafish infection to study the role of bacterial endosymbionts in host-Mucorales interactions. Stevens Robertin (from Serge Mostowy's lab, LSHTM) described his research using *Staphylococcus aureus* to study septin interactions with Gram-positive bacterial pathogens. Finally, Richard Allen (from Meera Unnikrishnan's lab, Warwick) discussed how *S. aureus* interacts with macrophages via the Type VII Secretion System (T7SS). The late evening ended with drinks, a dynamic poster session and electric discussion.

The following morning session was chaired by Charlotte Odendall (Kings College London). The second keynote speaker, Felix Randow, delivered a highly thought-provoking talk on how cells defend their

cytosol against invasive bacteria, revealing unexpected roles for the E3 ligase RNF213 in cell-autonomous immunity (Otten et al., 2021). Magdalena Szczesna (from Teresa Thurston's lab, Imperial College London) presented work on how cytosolic bacteria inhibit RNF213-mediated cell-autonomous immunity (Szczesna et al., 2023). Next, Miriam Kutsch, a new group leader at Heinrich Heine University (Germany), described her research on how guanylate binding proteins (GBPs) activate the non-canonical inflammasome. The last two talks of the morning session showcased local excellence. Lucy Thorne (from Greg Towers' lab at University College London and new group leader at Imperial College London) described the convergent evolution of SARS-CoV-2 variants of concern to enhance innate immune suppression (Thorne et al., 2022). Ann-Kathrin Reuschl (from Clare Jolly's lab at University College London) presented work on enhanced innate immune evasion by SARS-CoV-2 Omicron sub-variants (Mesner et al., 2023).

In a second set of flash talks, Ramon Garcia Maset (from Jennifer Rohn's lab, University College London), presented research on the role of the urinary microenvironment in biofilm and its effect on antibiotic response in uropathogens. Janis Romanopulos (from James Mason's lab, Kings College London) discussed research into the translation of pleurocidin-derived antimicrobial peptide therapeutics. Ioanna Panagi (from Teresa Thurston's lab, Imperial College London) presented work on the molecular dissection of kinase reprogramming by *Salmonella* effectors. Yizhou Huang (from Teresa Thurston's lab, Imperial College London) described work analysing antibacterial autophagy during infection with *Burkholderia*. Nagisa Yoshida (from Naomi McGovern's lab, Cambridge) revealed new tools to study the microbicidal capacity of human placental macrophages across gestation. Finally, Zoe Speirs (from Phil Elks' lab, Sheffield) reported on efforts to modulate macrophages as a therapeutic strategy in a zebrafish infection model of tuberculosis. The flash talk session was followed by poster presentations and networking, with lunch and coffee.

FIGURE 2 Organising committee.



The final session was chaired by Jennifer Rohn (University College London). Enrica Pellegrino (from Max Gutierrez's lab, Francis Crick) presented innovative work on the role of peroxisomes during *M. tuberculosis* infection of human macrophages (Pellegrino et al., 2023). Next was Kathryn Wright (from Stefan Oehlers' lab, Centenary Institute in Australia) who discovered, using zebrafish infection, that mycobacterial infection-induced miR-126 protects the host by suppressing permissive macrophages (Wright et al., 2021). J.J. Awodipe (from Meera Unnikrishnan's lab, Warwick) presented work on early transcriptomic responses of osteoblasts and *S. aureus* during intracellular infection. The final speaker of the afternoon was Daniel Foulkes (from Stephen Kaye's lab, Liverpool) on exotoxin inhibitors as new therapeutics, describing a drug discovery pipeline from in vitro to in vivo analysis.

The meeting closed with a robust community discussion and prize giving, over coffee and snacks. Giulia Manigrasso won the best oral presentation for her work on *Orientia*, and Ines Diaz del Olmo won the best poster prize for her work on *Salmonella*. Find out more about their work in their respective interviews published alongside this report (Ines, 2023; Manigrasso, 2023). We are very thankful to our flagship sponsor the Company of Biologists and *Molecular Microbiology* for promoting the work of talented early career researchers that has been showcased at the UK Cellular Microbiology Meeting since its first edition in 2019 (Figure 2). We also are grateful to LSHTM for helping to coordinate this event.

AUTHOR CONTRIBUTIONS

Serge Mostowy: Conceptualization; writing – original draft; writing – review and editing. **Charlotte Odendall:** Conceptualization; writing – original draft; writing – review and editing. **Daniel Humphreys:** Conceptualization; writing – original draft; writing – review and editing. **Philip M. Elks:** Conceptualization; writing – original draft; writing – review and editing. **Jennifer L. Rohn:** Conceptualization; writing – original draft; writing – review and editing.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

ETHICS STATEMENT

No human or animal subjects or materials were used in this commentary.

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REFERENCES

- Buchrieser, C. (2020) Celebrating the career and legacy of professor Pascale Cossart. *Molecular Microbiology*, 113, 535–537. Available from: <https://doi.org/10.1111/mmi.14478>
- Cossart, P. (2023) Raising a bacterium to the rank of a model system: the listeria paradigm. *Annual Review of Microbiology*, 77, 1–22. Available from: <https://doi.org/10.1146/annurev-micro-110422-112841>
- Gomes, M.C., Brokatzky, D., Bielecka, M.K., Wardle, F.C. & Mostowy, S. (2023) Shigella induces epigenetic reprogramming of zebrafish neutrophils. *Science Advances*, 9, eadf9706. Available from: <https://doi.org/10.1126/sciadv.adf9706>
- Hernandez-Gonzalez, M., Calcraft, T., Nans, A., Rosenthal, P.B. & Way, M. (2023) A succession of two viral lattices drives vaccinia virus assembly. *PLoS Biology*, 21, e3002005. Available from: <https://doi.org/10.1371/journal.pbio.3002005>
- Ines, D.D. (2023) Molecular microbiology interview-Ines Diaz del Olmo-Awardee of the best poster presentation at the UK Cellular Microbiology Network Meeting 2023. *Molecular Microbiology*. Available from: <https://doi.org/10.1111/mmi.15175>

- Manigrasso, G. (2023) Molecular microbiology interview-Giulia Manigrasso-Awardee of the best oral presentation at the UK Cellular Microbiology Network Meeting 2023. *Molecular Microbiology*. Available from: <https://doi.org/10.1111/mmi.15176>
- Mesner, D., Reuschl, A.K., Whelan, M.V.X., Bronzovich, T., Haider, T., Thorne, L.G. et al. (2023) SARS-CoV-2 evolution influences GBP and IFITM sensitivity. *Proceedings of the National Academy of Sciences of the United States of America*, 120, e2212577120. Available from: <https://doi.org/10.1073/pnas.2212577120>
- Otten, E.G., Werner, E., Crespillo-Casado, A., Boyle, K.B., Dharamdasani, V., Pathe, C. et al. (2021) Ubiquitylation of lipopolysaccharide by RNF213 during bacterial infection. *Nature*, 594, 111–116. Available from: <https://doi.org/10.1038/s41586-021-03566-4>
- Pellegrino, E., Aylan, B., Bussi, C., Fearn, A., Bernard, E.M., Athanasiadi, N. et al. (2023) Peroxisomal ROS control cytosolic Mycobacterium tuberculosis replication in human macrophages. *The Journal of Cell Biology*, 222, e202303066. Available from: <https://doi.org/10.1083/jcb.202303066>
- Pizarro-Cerda, J. (2020) Pascale Cossart: listeria monocytogenes, host-pathogen interactions & beyond. *Cellular Microbiology*, 22, e13165. Available from: <https://doi.org/10.1111/cmi.13165>
- Szczesna, M., Huang, Y., Lacoursiere, R.E., Bonini, F., Pol, V., Koc, F. et al. (2023) Dedicated bacterial esterases reverse lipopolysaccharide ubiquitylation to block immune sensing. *Research Square*. Available from: <https://doi.org/10.21203/rs.3.rs-2986327/v1>
- Thorne, L.G., Bouhaddou, M., Reuschl, A.K., Zuliani-Alvarez, L., Polacco, B., Pelin, A. et al. (2022) Evolution of enhanced innate immune evasion by SARS-CoV-2. *Nature*, 602, 487–495. Available from: <https://doi.org/10.1038/s41586-021-04352-y>
- Wright, K., de Silva, K., Plain, K.M., Purdie, A.C., Blair, T.A., Duggin, I.G. et al. (2021) Mycobacterial infection-induced miR-206 inhibits protective neutrophil recruitment via the CXCL12/CXCR4 signalling axis. *PLoS Pathogens*, 17, e1009186. Available from: <https://doi.org/10.1371/journal.ppat.1009186>

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