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Biotechnology and Biological Sciences Research Council

Nottingham Trent University

# Welcome to The Nottingham BBSRC DTP Spring Conference 2025

## Tuesday 15 and Wednesday 16 April

**Law & Social Science Building, University Park, UoN (15th)**
**Teaching and Learning Building, Clifton Campus, NTU (16th)**

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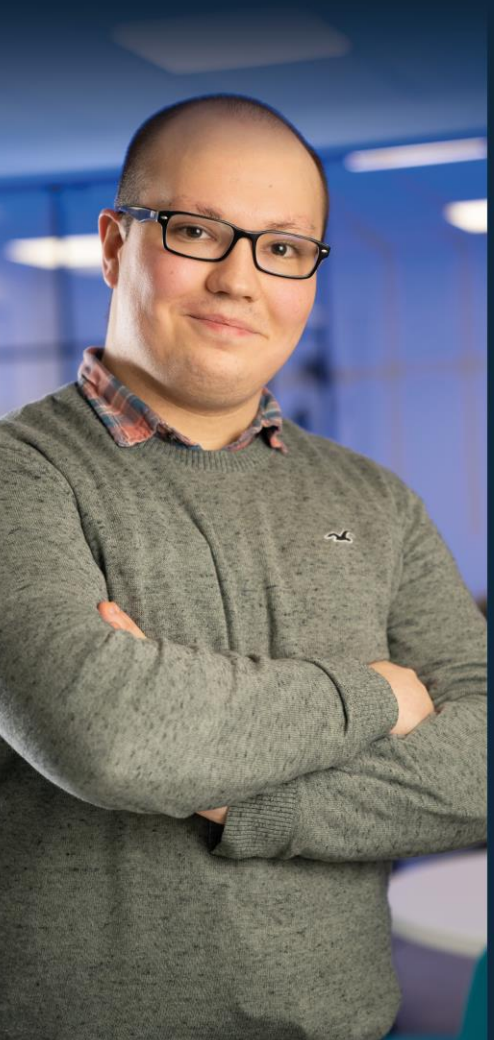

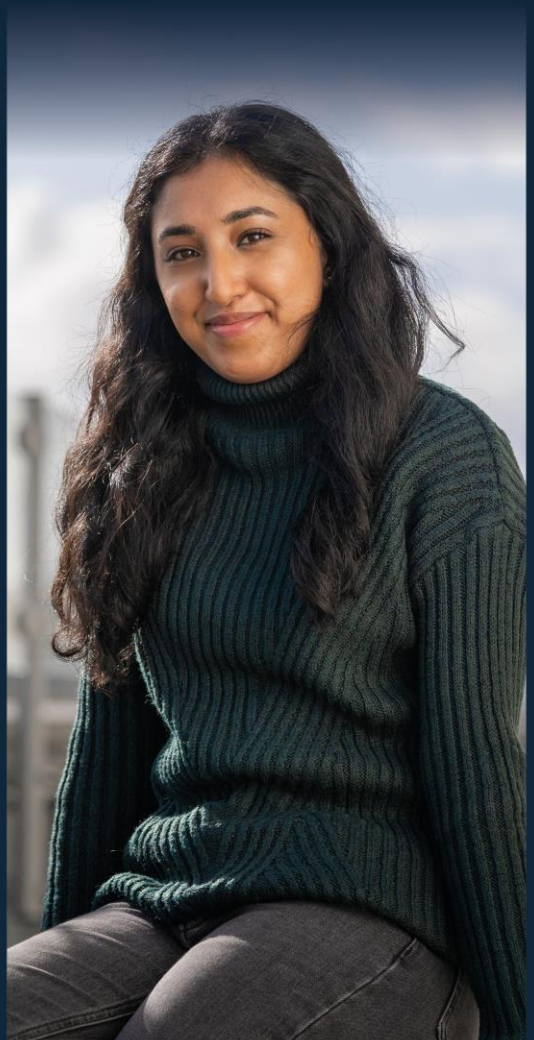

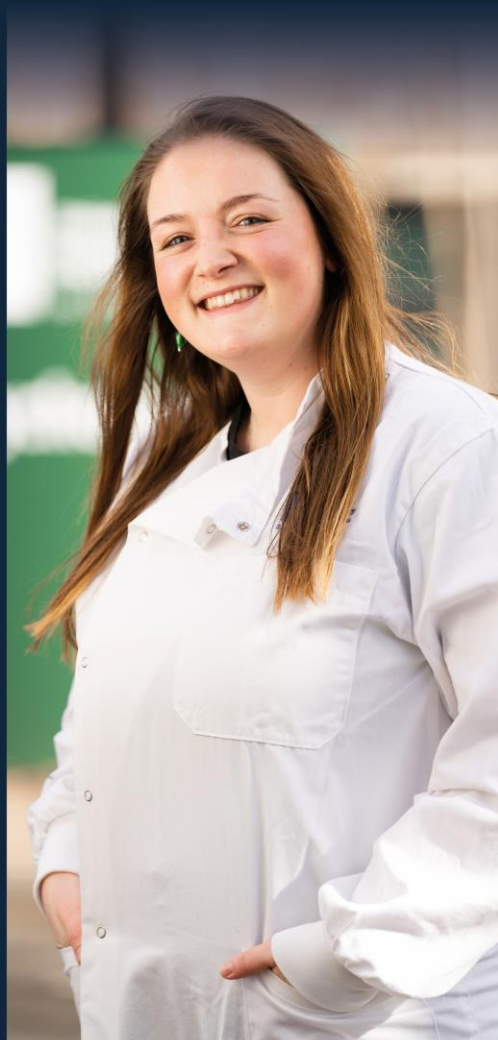

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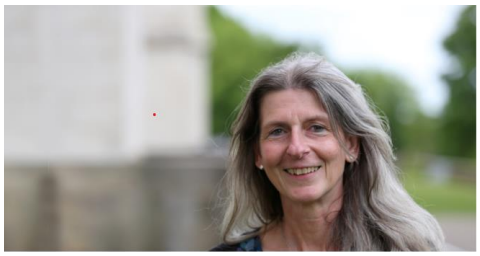


*Dear Delegate*

*Welcome to the Nottingham BBSRC DTP Spring Conference 2025 and good luck to our students in their presentations, whether they are talks, 3min thesis presentations or posters. We are all looking forward to hearing about the exciting research that you have been conducting.*

*Spring Conference is an excellent opportunity to get together and share research ideas, questions and mingle with your peers and the keynote speakers - make sure you make the most of it.*

*It may feel a bit scary giving a presentation, but everyone is friendly, and it is a great chance to present your work and get feedback from others who may not be closely aligned to your area. Remember that asking lots of questions is a great way of finding out more, there are no silly questions, and people always wants to talk about their research!*

*The more you network and chat about science the more you will discover and extend your links to people that may prove helpful in the future. It will enable you to discover more about what is happening across the DTP and beyond.*

*Thank you to all those who have made the conference possible, these include academic, research and technical staff. A special thank you to our Keynote Speakers, and of course the DTP Team who have made all of this happen, particularly Mandy Gill.*

*We hope you enjoy the opportunity to be able to get together and hear about the exciting research that is ongoing across the DTP- enjoy the conference!*

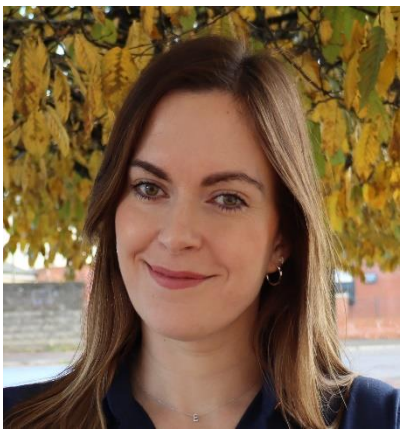
*Best wishes*

*Zoe*

***Professor Zoe A Wilson BBSRC DTP Director***

# Speakers

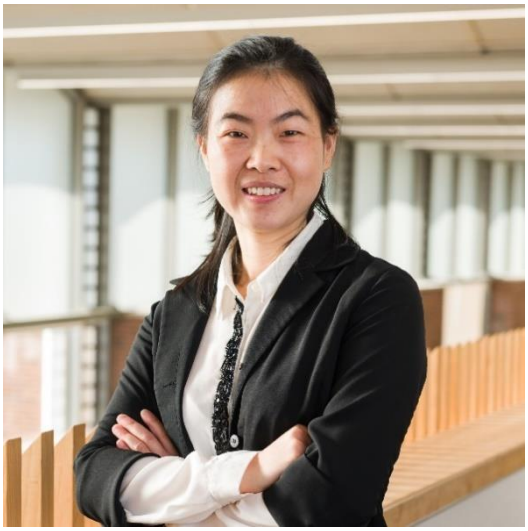
**Tuesday Keynote Speaker**
**Dr Emma Yhnell,** Associate Dean of Equality, Diversity and Inclusion and Reader in Neuroscience, Cardiff University



Dr Emma Yhnell is a passionate and multi award-winning educator and science communicator, she won the Society for Neuroscience Science Educator Award in 2024 and a National Teaching Fellowship in 2023, and is currently Associate Dean of Equality, Diversity and Inclusion and a Reader in Neuroscience at Cardiff University. Emma obtained a BSc degree in Biochemistry before completing a PhD in Huntington's disease. She then began an independent research fellowship to translate her findings on cognitive training into the patient clinic. Emma's clinical research inspired her and demonstrated the need to provide accessible and engaging information to diverse public audiences.

Emma now teaches the next generation of budding scientists as a teaching and scholarship focused academic. Emma delivers engaging and interactive sessions with passion and infectious enthusiasm, and she has built a reputation for her ability to untangle the academically technical and translate it into entertaining, relevant and engaging content. In 2022 she was elected to the Learned Society of Wales as the youngest ever Fellow. As a first generation academic with expertise in equity, diversity and inclusion, and a passion and desire to embrace change, Emma is changing the typical image of academia by making science more open, honest and fun.

**Wednesday Keynote Speaker**
**Dr Cuifeng Ying,** Senior Lecturer in the Department of Engineering, Nottingham Trent University (NTU).



Dr Cuifeng Ying is a senior lecturer in the Department of Engineering at the Nottingham Trent University (NTU). She is an active biophysics researcher specialising in the use of nanostructured sensors to characterise disease related proteins at the single-molecule level, with the goal of facilitate early-stage disease diagnosis. An example of her research outcomes can be found here: https://www.ntu.ac.uk/about-us/news/news-articles/2023/04/first-of-its-kind-study-of-single-protein-paves-wayto-improving-understanding-of-disease

Dr Ying received her Ph.D. in Physics at Nankai University, where she utilised photonic crystals and plasmonic nanocavities to enhance fluorescent signals for biosensing applications. In 2016, she joined the Biophysics group at the Adolphe Merkle, Institute at the University of Fribourg, as a postdoctoral researcher, focusing on single-molecule proteins characterisation using solid-state nanopore technology. In 2021, Dr Ying joined advanced optics and photonics (AOP) group at NTU as a theme leader.

# Conference Overview – Day 1

**Tuesday 15th April 2025**
**Law & Social Science Building, University Park, UoN**

| TIME | SESSION |
|---|---|
| 10.00-10.15 | Registration and refreshments<br>(Please note, registration is only for guests. All DTP students will register via Inkpath in sessions)<br>**Atrium, Nort Entrance, Law and Social Science Building** |
| 10.15 | **Welcome –**<br>**Professor Zoe Wilson,** Director of the DTP<br>**B62** |
| 10.20 | **Melea Sinclair,** The Black PhD Collective<br>**B62** |
| 1025-11.00 TALK including Q&A | **Keynote talk:**<br>**Dr Emma Yhnell,** Associate Dean of Equality, Diversity and Inclusion and Reader in Neuroscience, Cardiff University<br>'Breaking out of the ivory tower'<br>**B62** |
| 11.00-11.15 | **Coffee Break**<br>**Atrium, Law and Social Science Building** |
| 11.15-12.30 | **3 Minute Thesis** (Year 4 presentations)<br><br>Session 1 – **B62** Chair – Cathy Levien<br>Session 2 – **B63** Chair – Rachel Walker<br><br>(As a guest, choose either session) |
| 12.30-13.30 | **Lunch**<br>**Atrium, Law and Social Science Building** |
| 13.30-15.00 | **Student talks/presentations** (Year 1 & Year 3)<br><br>**Session 1 – David Scott** Biotechnology and Agriculture and Food Security<br>**B1**<br><br>**Session 2 – Tobias Bast** Bioscience for Health Session 1<br>**B62**<br><br>**Session 3 – Rian Griffiths** Bioscience for Health Session 2<br>**B63**<br><br>**Session 4 –Fernando Perez-Cota** Bioscience for Health Session 3<br>**A4**<br><br>(As a guest, choose either session) |
| 15.00-15.15 | **Coffee Break**<br>**Atrium, Law and Social Science Building** |

| | |
|---|---|
| 15.15-16.00 | **<u>Parallel Talks</u>**<br><br>**Session 1 – Hadrien Peyret**<br>Using plants as green factories to make pharmaceuticals and vaccines<br>**B63**<br><br>**Session 2 – Sally Wheatley & Megan Barnes**<br>Launching The Nottingham Mitochondrial Network at BBSRC DTP Conference<br>**B1**<br><br>**Session 3 – Pete Harvey**<br>Molecular imaging for biomedical investigations<br>**B62**<br><br>**Session 4 –Alfie Hoar, Sense about Science**<br>Championing Science: Inspiring Early Career Researchers to Get Their Voices Heard<br>**A4**<br><br>**Session 5 – Gaby Norman and Megan Bates**<br>Bridging Research and Enterprise: Unleash Your Entrepreneurial Potential with YES (Your Entrepreneurs Scheme)<br>**A2**<br>(Please attend any session) |
| 16.00 | **Close of Day 1** |

# Conference Overview – Day 2

**Wednesday 16th April 2025**
**Teaching and Learning Building, Clifton Campus, NTU**

| TIME | SESSION |
|---|---|
| 10.00-10.15 | Registration and refreshments<br>**LT4** |
| 10.15 | **Welcome**<br>**Prof Mark Christian,** NTU Academic Lead for BBSRC DTP/DLA<br>**LT3** |
| | **Student conference committee–**<br>**Sebastian Thompson** |
| 10.20 TALK including Q&A | **Keynote talk:**<br>**Dr Cuifeng Ying,** Senior Lecturer in the Department of Engineering, Nottingham Trent University (NTU).<br>*Optical Nanotweezers for Monitoring Conformational Dynamics of Single, Unmodified Proteins*<br>**LT3** |
| 11.00-11.15 | **Coffee Break**<br>**LT4** |
| 11.15-12.30 | **Student talks/presentations** (Year 1 & Year 3)<br>**Session 1 – Simon Welham** Bioscience for Health Session 1<br>**LT2**<br><br>**Session 2 – Jessica Piasecki** Bioscience for Health Session 2<br>**LT3**<br><br>**Session 3 – Jack Leo**<br>Biotechnology and Agriculture and Food Security Session 1<br>**P04-P06**<br><br>**Session 4 – Simone Morra**<br>Biotechnology and Agriculture and Food Security Session 2<br>**P09-P11**<br><br>(As a guest, choose either session) |
| 12.30-13.30 | **Lunch**<br>**LT4** |
| 13.30-14.30 | **Poster Session** (Year 2)<br>**LT4** |
| 14.30-14.45 | **Coffee Break**<br>**LT4** |

| | |
|---|---|
| 14:45-15.30 | **<u>Parallel Talks</u>**<br><br>**Session 1 – Laura Hobley**<br>In search of prey: polyamine usage by *Bdellovibrio* as a chemosensory ligand and regulator of bacterial predation.<br>**LT2**<br><br>**Session 2 – Lisa Chakrabarti**<br>Mitochondrial physiology: in beasts from bench to benthos.<br>**LT3**<br><br>**Session 3 – Stephen Lawrence**<br>Brewing up yeast oral vaccines<br>**P04-P06**<br><br>(Please attend the session you have booked onto) |
| 15.30-16.00 | **<u>Closing session</u>**<br>Prize giving and closing remarks<br>**LT3** |

## Day 1 conference location – University of Nottingham, University Park

**Map:**
https://www.nottingham.ac.uk/sharedresources/documents/mapuniversitypark.pdf
Law and Social Science Building is buildings 7 on the map.

**Address:**
University of Nottingham, University Park Campus, University Blvd
Nottingham NG7 2RD

**Parking:**
Closest parking is at Law & Social Sciences building.
Parking is limited and parking passes must be requested from the DTP Team beforehand at bbdtp@nottingham.ac.uk
Please note, parking is not available for DTP students.

## Day 2 conference location – Nottingham Trent University, Clifton Campus

**Map**:https://www.ntu.ac.uk/__data/assets/pdf_file/0026/175652/clifton-campus-map.pdf

Teaching and Learning Building is building 12 on the map.

**Address:**
College Dr, Clifton, Nottingham NG11 8NS

**Parking:**
Parking is not available at NTU, please use the Hopper bus from University Park, timetable details:
https://www.nottingham.ac.uk/sustainability/documents/transport/2024-25-hopper/university-901.pdf

# Additional information

## Decompression Rooms

There will be decompression rooms if you require a quiet space in the following locations:

Tuesday 15th April – A103, Law and Social Science Building, University Park, NTU
Wednesday 16th April P03, Teaching and Learning Building, Clifton Campus, NTU

## Student conference committee

A number of year 1 students will be running events during day 2 of conference at NTU. For more information see below:

We intend to run two stalls throughout the second day of the spring conference (16th April) to aid students' understanding of science outreach opportunities and wellbeing during the annual spring conference.

**Showcase of science communication (sci-com) organisations in Nottingham. LT4, Teaching and Learning Building, NTU**
The event will feature stalls from approximately 5 local organisations to promote public engagement, science communication, and outreach (Festival of Science and Curiosity, Pint of Science, Science in the Park, New Perspectives, Impact Magazine *student society*). The event is scheduled to run 10:00 to 13:30, with organisations dressing their own tables. This will take place in LT4.

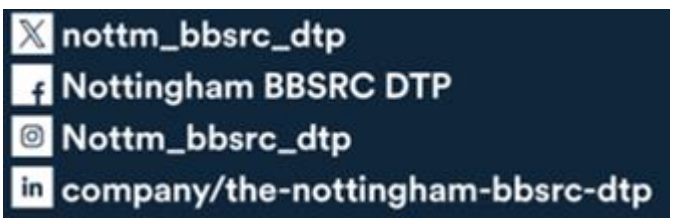
**Wellbeing space with Arts & Crafts, P08 Teaching and Learning Building, NTU**
Providing students with the chance to relax and decompress during, what can be for some, a potentially very stressful day. The event will include wellbeing craft activities for attendees, aimed at fostering relaxation and creativity. The craft room will be open all day.

## Social Media Takeover

Some Y1 students will be doing our social media takeover during conference. If you do not wish to be in DTP photography/media during conference, please make one of the DTP Team aware.

## Social Media Competition

There will be a prize for the most innovative social media post using the hashtag #SpringConference2025 on any of the following platforms:



# Conference Programme

## Tuesday 15 April (University of Nottingham)

**10.15** **Welcome from the Director of DTP**
Professor Zoe Wilson

**10.20** **Melea Sinclair,** The Black PhD Collective

**10.25-11.00** **Keynote Talk**

***Breaking out of the ivory tower.***

*Join Dr Emma Yhnell for this keynote talk where Emma will reflect on her unique career journey, from researcher to lecturer and associate dean, who can also be found presenting BBC radio shows, writing popular science books and inviting school children to have a go at some do-it-yourself blancmange brain surgery.*

*Emma will draw on her international work in equity, diversity and inclusion, science communication and media communication, alongside her passion for enabling people to be authentically themselves in their academic roles, whether that is through teaching, research, science communication or leaving academia entirely. She will reflect on her transition from Biochemistry to Neuroscience, before moving her pre-clinical research to the Huntington's disease clinic and proudly becoming a lecturer on a teaching and scholarship pathway. At the heart of everything that she does, Emma's passion and desire to make science more accessible, inclusive and fun for diverse audiences is fundamental to her work.*

*So come along to listen, learn and challenge your own thinking about how you can use and improve your skills to be authentically you while, pushing for meaningful change and breaking your own boundaries within academia and beyond.*

**Dr Emma Yhnell,** Associate Dean of Equality, Diversity and Inclusion and Reader in Neuroscience, Cardiff University
followed by Q&A
Chair: **Professor Sara Goodacre**

**11.00-11.15** **Coffee Break** - **Atrium**

**11.15-12.30** **3 Minute Thesis** (Year 4 students)

Year 4 students will present their thesis in a 3-minute presentation.

Please attend one of the sessions below.

**Session 1:**
**Chair;** Cathy Levien, DTP Team
**Voting: Professor Jeanette Woolard** Associate Pro-Vice-Chancellor for the Researcher Academy and Research Culture Development will select the winner from this session.
**B62**

| Name | 3MT title |
|---|---|
| **Claire Smith** | There is a link between loss of body plan complexity and loss of auxin signalling components in duckweed |
| **Ana Cardoso Ferreira** | From Molecules to Movement: reading cow health before it's visible |
| **Jake Hill** | It's Getting Hot In Here: Aegilops umbellulata, Wheat, & Heat |
| **Hiya Deshpande** | From Pollution to Solution: Exploring metabolic capabilities of a novel bacteria interacting with PET monomers |
| **Ashleigh Smith** | Lame Sheep |
| **James Stanley** | Effects of prebiotic xylo-oligosaccharides on performance and gut health of weaning pigs |
| **Katie Wilshaw** | NMR Metabolomics of Poultry: Age, Sex, and Alternative Diet Impacts on Health and Efficiency |
| **Elliott Lowes** | An investigation into the effect of neuronal proteasome inhibition on glial cells |
| **10 minute break** | |
| **Rachel Grasmeder Allen** | The ventral hippocampus and reversal learning |
| **Francesca Occhiuto** | Behavioural variation and personality types in dairy calves from precision livestock technologies and associations with health and weight gain |
| **Rebecca Pope** | Inflammation in sensory neurones: when peripheral mechanisms and central processes meet |
| **Jessica Lester** | A new world of microbial warfare: using Pseudomonas to kill Pseudomonas |
| **Lathika Vaniyan** | Sustainable Future Foods: Crosslinked Hydrogels for Fibre Formation |
| **Dhruvika Varun** | ASH1L histone methyltransferase: a novel therapeutic target in prostate cancer? |
| **Natalia Kotynska** | Development of Outer Membrane Vesicle Vaccine against Clostridioides difficile |
| **Maria Haque** | Epigenetics in Breast Cancer |

**Session 2:**
**Chair;** Rachel Walker, DTP Team
**Voting; Professor Emma Yhnell** Associate Dean of Equality, Diversity and Inclusion and Reader in Neuroscience, Cardiff University, will select one winner from this session
**B63**

| Name | 3MT title |
|---|---|
| **Hannah Mbiwan-Erubu** | Exploring the effect of R241Q, a neurodevelopmental mutation on the structure and function of USP11 |
| **Joshua Morrison** | What makes a Streptococci a Streptococci? |
| **Asaph Kuria** | Unravelling the enzymatic dynamics of mould-ripened Camembert and Brie Cheeses |
| **Rebecca Brociek** | Cats and CKD- why are they different to every other species? |
| **Joseph Stones** | Identifying microproteins involved with epitranscriptomic mechanisms in the brain |
| **Alexander Williams** | Determining the contribution of tomato fruit photosynthesis to yield and quality. |
| **Chantelle Endeley** | Mechanisms underpinning evolution and adaptations to inhibition of cell cycle regulator, Cdc25 phosphatase, in the yeast model organism Schizosaccharomyces pombe |
| **Ilma Amalya Qonaah** | Unraveling the triad: plant-aphid-BYDV interactions and resistance mechanism in wheat |
| **10 minute break** | |
| **Alex Pate** | Meddling with Mycoprotein: Novel Strain Development of Fusarium venenatum |
| **Jing Feng** | Using a novel multimodal system as flavour- impairment-training (FIT) tool - Is it feasible? |
| **Adesh Vaidya** | Unraveling survivin |
| **Shaikha Al-Musawi** | Molecular adaptation of acidic pH in Triple negative breast cancer |
| **Caitlin Wildsmith** | Exploring the Poly-γ-dl-glutamic Acid (PGA) layer in Coagulase-Negative Staphylococci as a promising target for anti-virulence therapy |
| **Xena Lewis** | A method to measure the three-dimensional real-time growth of sucrose single crystals in highly concentrated solutions. |
| **Constance Dalton** | Design and Synthesis of Novel Allosteric Modulators for the Prostaglandin EP2 Receptor |
| **Mercedes Vazquez** | Tiny Tumors, Big Discoveries: A New Approach to Triple Negative Breast Cancer |

## 12.30-13.30 Lunch Break - Atrium

## 13.30-15.00 Year 1 and Year 3 Student Presentations

Year 1 students will present a 2-minute flash presentation on their project.
Year 3 students will present a 10-minute talk on their research, questions should be included within the 10 minutes.

Please attend one of the sessions below. There will be a break halfway through each session.

The Chair of each session will select one year 1 and one year 3 winner from each session.

**Session 1 – David Scott**
Biotechnology and Agriculture and Food Security
**B1**

| Year | Name | Project title (Y1) Talk title (Y3) |
|---|---|---|
| **1** | **Summer Revely** | Haploid Genetic Screens for Better Delivery Systems of Therapeutic Nucleic Acids |
| **1** | **Diana Laura Amado Sanchez** | Evaluating impacts of elevated $CO_2$ and temperature on yield and grain quality in cereals |
| **3** | **Jonathan Heale** | A Bitter Tug-of-War: Exploiting fungal sexual reproduction for better blue cheese. |
| **1** | **Molly Simpson** | Methane Microbiology |
| **3** | **Agnes Aboagye** | Diversifying world agriculture, a common framework for crop data comparison |
| **5 minute break** | | |
| **1** | **Hoang Thong Le** | Discovering new components and functions of plant oxygen sensing |
| **3** | **Olivia Downs** | The Molecular Annealing Mechanism of HelQ |
| **1** | **Ebikeseye Jeremiah** | Optimisation of protease feed additives for poultry to increase protein utilisation efficiency from locally produced sources |
| **3** | **Erfan Ghafouri** | Regulation of root gravitropism in Arabidopsis roots |
| **1** | **Damian Chmarzynski** | The plasticity of insects' microbiome and the impact of feeding to chickens |
| **1** | **Victoria Lightfoot** | How mechanosensing drives root penetration in hard soil? |
| **3** | **Ziruo Zhao** | Evolving novel yeast expression hosts for large scale biomaterial and biologic production |

**Session 2 – Tobias Bast**
Bioscience for Health Session 1
**B62**

| Year | Name | Project title (Y1) Talk title (Y3) |
|---|---|---|
| **3** | **Morgan Dennis** | The Design and Synthesis of Fluorescent Ligands for the Human Beta-3 Adrenoceptor' |
| **1** | **Tijmen van Slageren** | Exosome biogenesis and organelle trafficking in neurodegeneration. |
| **1** | **Tobias Long** | Identifying the mechanisms of gut–brain axis to sweet sensing in patients with type 2 diabetes using neuroimaging techniques |
| **3** | **Erik Petter Hamilton-Stanley** | Using Super Resolution microscopy to investigate mutant transcripts in Myotonic Dystrophy 1 |
| **5 minute break** | | |
| **3** | **Isabelle Forder-Denham** | Modelling the complex tumour microenvironment of medulloblastoma |
| **1** | **Ewan Drever-Smith** | The Fast and Non-Spurious: High-content screening without artefact in barrier tissues on a chip. |
| **3** | **Une Kontrimaite** | Mass spectrometry-based metabolic profiling and imaging of astrocyte and glioblastoma invasive margin cells |
| **3** | **Laura Hill** | Measuring the effect of warming and cooling trigeminal compounds on salivary properties |
| **1** | **Darcy Thatcher** | Native mass spectrometry for the discovery of new anticancer agents |

**Session 3 – Rian Griffiths**
Bioscience for Health Session 2
**B63**

| Year | Name | Project title (Y1) Talk title (Y3) |
|---|---|---|
| **1** | **Alice Stringer** | Investigating the Neurobiological Mechanisms of Psychdelics and their Potential to Treat Affective Disorders |
| **3** | **Katherine Mortimer** | The role of mitochondria in antipsychotic-induced metabolic syndrome |
| **1** | **Rachel Thompson** | Gene switches and treatment resistance in advanced cancer |
| **3** | **Arppana Varughese** | Optimisation of the carbene footprinting workflow to aid in mapping protein-protein and protein-ligand interactions |
| **1** | **Sarah Masterson** | mRNA cap methylation – localisation and mechanisms in gene expression and RNA therapeutics |
| **3** | **Jacob Juty** | Perineuronal nets in cognition and behaviour |
| **5 minute break** | | |
| **1** | **Bethan Williams** | Investigating the role of the tumour microenvironment in 3D models of Diffuse Midline Gliomas. |
| **3** | **Katie Hodson** | Post-translational regulation of SKP1 during meiosis |
| **1** | **Adam Smith** | Investigating the Anti-Inflammatory Effects of Celecoxib and Loxoprofen in Glioblastoma |
| **3** | **Thomas Power** | Gingivitis and Oral Microbiome Resilience: A Metagenomic Analysis |
| **1** | **Emma Charity** | Investigating regulatory mechanisms of the AP1 transcription factor in hypoxic (low oxygen) cell adaptation |

**Session 4 –Fernando Perez-Cota**
Bioscience for Health Session 3
**A4**

| Year | Name | Project title (Y1) Talk title (Y3) |
|---|---|---|
| **3** | **Jen Cale** | Redefining Normoxia in Neurophysiology |
| **1** | **Vladimirs Zenko** | Studies of GPCR signalling using single molecule protein-protein interaction quantum biosensors |
| **3** | **Joseph Allen** | Investigating Rab39A Function in High-Risk Medulloblastoma |
| **1** | **Nikki Bonett** | Neuromuscular plasticity of aged humans |
| **3** | **Alex Paramore** | Decoding mitosis in trypanosome parasites through genetic interactions |
| **5 minute break** | | |
| **1** | **Chloe Blackery** | The exploration of cannabidiol (CBD) analogues for enhanced therapeutic efficacy |
| **3** | **Armin Nikpour Khoshgrudi** | Understanding the bias signalling in GPCR proteins through structural analysis |
| **1** | **Sarah Collinson** | Synthesis of fluorescently labelling ligands for the atypical chemokine receptor 3 (ACKR3) |
| **1** | **Charles Cresswell** | What makes endothelial cells start growing? Interactions between transcription factors and microtubules |
| **3** | **Ahmed Ramzy** | The Molecular Mechanisms of Primordial Germ Cell Specification in the Pig |
| **1** | **Sneha Sara Binu** | How the spinal cord talks to the brain: Illuminating the sensory output system of the spinal cord |

## 15.00-15.15 Coffee Break - Atrium

## 15.15-16.00 Parallel Sessions

### Session 1 – Hadrien Peyret

***Using plants as green factories to make pharmaceuticals and vaccines***

I will introduce the concept of plant molecular farming (the use of plants as expression systems for the production of high-value proteins and small molecules of interest. I will explain how this is done, why, and what sorts of products (vaccines, antibodies, anti-cancer drugs...) can be made in plants using this technology.

**B63**

### Session 2 – Sally Wheatley and Megan Barnes

***Launching The Nottingham Mitochondrial Network at BBSRC DTP Conference***

Sally Wheatley: Welcome and Aim of the NMN
Sally Wheatley: Mitochondrial Survivin, an Achilles' Heel of Cancer?
Megan Barnes: "Adaptive differences between mitochondrial lineages in Atlantic stickleback"

**B1**

### Session 3 – Pete Harvey

***Molecular imaging for biomedical investigations***

Our ability to study living systems is severely limited by our inability to visualise real-time biochemical processes. New approaches are needed that combine biochemically specific in vivo real-time imaging with in vitro and ex vivo approaches. Our efforts are focused on the design and application on novel contrast agents for molecular magnetic resonance imaging (MRI). Key applications include targeting of biomarkers, metabolic profiling, and tracking drug delivery. Our approach involves using both heteronuclei and (super)paramagnetic properties of metals as molecular and nanoparticle MRI contrast agents, with applications in a variety of in vitro, ex vivo, and in vivo models. We are particularly focused on the use of multimodal imaging and spectroscopy approaches towards multichannel imaging, in addition to the development of phantoms with increased applicability in MR experiments. Our goals are to tailor imaging to report on analytes and physiology (pH, metals/anions, etc), cell phenotyping, and metabolic processes.

**B62**

### Session 4 – Alfie Hoar, Sense about Science

***Championing Science: Inspiring Early Career Researchers to Get Their Voices Heard***

- Introduction to Sense about Science including context of when and why we were founded and how the world stands now
    - Our mission to promote the public interest in sound science and evidence
    - Why evidence matters
    - Who we work with and some examples of past and current projects
- Emphasis on our work with early career researchers
    - Why your (ECR's) voice matters
    - Our Voice of Young Science programme
    - How to have difficult conversations about science
- Next steps: Things you can do now as an ECR to promote the public interest and appreciation of research and the research process
- Any remaining time for questions

**A4**

**Session 5 – Gaby Norman and Megan Bates**
***Bridging Research and Enterprise: Unleash Your Entrepreneurial Potential with YES (Your Entrepreneurs Scheme)***
The awareness session will provide an introduction of how you can learn to turn research ideas into impact and why PhDs and Postdocs should join YES.
**A2**

## Close of Day 1

# Wednesday 16 April (NTU Clifton Campus)

## 10.15 Welcome from **Prof Mark Christian,**

NTU Academic Lead for BBSRC DTP/DLA

## Keynote talk

**Optical Nanotweezers for Monitoring Conformational Dynamics of Single, Unmodified Proteins**

*Conformational dynamics of proteins are critical for their biological functions but are challenging to study at the single-molecule level. In this talk, I will share our research of using aperture-based optical nanotweezers to trap single, unlabelled proteins in a physiological solution, and monitor their conformational changes in response to sequential environment variations, such as pH and salt concentration. Specifically, we will demonstrate the capabilities of optical nanotweezers in various applications at single-molecule level, including protein disassembly pathway, protein-small molecule binding kinetics, and energy landscape of intrinsically disordered proteins. The approach presented here can be widely adopted by other biophysical studies on conformational dynamics of single proteins without the requirement of site-specific modifications.*

**Dr Cuifeng Ying, Senior Lecturer in the Department of Engineering, Nottingham Trent University (NTU),**

followed by Q&A session

Chair: **Professor Mark Christian**

## 11.00-11.15 Coffee Break – LT4

## 11.15-12.30 Year 1 and Year 3 Student Presentations

Year 1 students will present a 2-minute flash presentation on their project.
Year 3 students will present a 10-minute talk on their research.

Please attend one of the sessions below. There will be a short break halfway through each session.

The Chair of each session will select one year 1 and one year 3 winner from each session.

**Session 1 – Simon Welham**
Bioscience for Health Session 1
**LT2**

| Year | Name | Project title (Y1) Talk title (Y3) |
|---|---|---|
| **1** | **Hannah Evans** | The Effect of Hypoxia on Glycosaminoglycans in Cancer |
| **3** | **Thomas white** | Developing an ileal vaccine delivery platform |
| **1** | **Ozde Cetinsoy** | GPCR/RAMP signalling during blood-brain barrier formation and function |
| **1** | **Kai Parkin** | Pluripotent stem cell research related to human development and regenerative medicine |
| **3** | **Meléa Sinclair** | The Evolution of regulation in the origin and diversification of mammal reproduction. |
| **5 minute break** | | |
| **1** | **Ayesha Mohamed Sherief** | The lateral septum as an interface between hippocampus and behaviour |
| **1** | **Tinyiko Katlego Modikoane** | Antisense transcripts as novel biomarkers involved in the pathogenesis of endocrine-related cancers |
| **3** | **Scott Gadsby** | Genetic Data Analysis |
| **1** | **Sakura Likar** | Mapping adenosine receptor interactomes in human cells utilising NanoBRET protein-protein interaction & CRISPR/Cas9 mediated proximity proteomics |
| **3** | **Jasmin Simpson** | Dual-parental periconceptional low protein diet may affect embryo quality and development in mice. |
| **1** | **Natheer Haddad** | Next-generation nanoparticle functionalisation for selective delivery to brain tumours |

**Session 2 – Jessica Piasecki**
Bioscience for Health Session 2
**LT3**

| Year | Name | Project title (Y1) Talk title (Y3) |
|---|---|---|
| **3** | **Oliver Boakye** | Structural and Functional Studies on African Horse Sickness Virus to engineer a protein-based vaccine prototype |
| **3** | **Krzysztof Raszpla** | Functional and Structural studies of Ubiquitin-Specific Protease (USP) 9X and 9Y |
| **1** | **Charly Neilson** | Consequences of LPS modifications on Gram-negative bacterial cell fitness |
| **3** | **Luke Shipley** | Soil survival and re-emergence: the continued threat of plague. |
| **3** | **Farah Mahmood** | Understanding how the cancer-causing bacterium Helicobacter pylori evolves resistance to antibiotic treatments |
| **5 minute break** | | |
| **1** | **Beth Titchiner** | Towards a pan-lineage vaccine: antigenic mapping of Lassa virus glycoprotein |
| **3** | **Saaman Zargarbashi** | Direct observation of single intrinsically disordered proteins in solution |
| **1** | **Siavash Rakhtshah** | Neurochemical Changes in Response to Human Errors and Shifts in Attention |

**Session 3 – Jack Leo**
Biotechnology and Agriculture and Food Security Session1
**P04-P06**

| Year | Name | Project title (Y1) Talk title (Y3) |
|---|---|---|
| **3** | **Eve Murray** | Single Cell Protein for Agriculture |
| **1** | **Robert Craig-Wood** | Engineering Biology approaches to functionalised hydrogel production |
| **3** | **Rosemary Reyneke** | Developing a novel framework to improve the uptake of preventive medicine practices on ruminant farms |
| **1** | **Roman Sadeghian** | Does fertilizer placement play a key role in crop establishment? |
| **3** | **Samuel Windle** | From Antibiotics to Alternatives: Investigating Rumenproof's Effect on Gut Microbiota and AMR Dynamics |
| **5 minute break** | | |
| **1** | **Kundai Vurayayi** | Evaluating smart adsorbent materials and enzymes in wastewater environments for emerging pollutant remediation and equitable wastewater reuse. |
| **1** | **Rosemary Evans** | Microbiomes of beneficial arthropods in agricultural systems and their influence on biocontrol |
| **3** | **Dominic Ralph** | Molecular mechanisms of multi-drug efflux pump AcrB in antimicrobial resistance |
| **1** | **Regina Galan Bataller** | From nature to industry: applying $H_2$-metabolising enzymes to sustainable biocatalysis. |
| **1** | **Markos Broumas** | New potent antiparasitic agents against livestock resistant roundworms |

**Session 4 – Simone Morra**
Biotechnology and Agriculture and Food Security Session 2
**P09-P11**

| Year | Name | Project title (Y1) Talk title (Y3) |
|---|---|---|
| **1** | **Saskia McCormack** | Streamlining synthetic genomes for designer organisms |
| **1** | **Sebastian Thompson** | Antibiotic use and microbiome of invertebrates associated with fish farms: Effects on water quality and fish health |
| **3** | **Lucy Baker** | Understanding the predators of hoverflies |
| **1** | **Lynette Akuffo** | Machine Learning for predicting yeast phenotype from genotype for biotech applications |
| **3** | **Millie Johnson** | Combinatorial biological design enables sustainable and stable bioplastic production in *E. coli* |
| **5 minute break** | | |
| **3** | **Giulia Roselli** | Beer Spoilage Yeasts: Impacts on No- and Low- Alcohol Beer Flavour |
| **1** | **Yarrow Beckman** | Enhancing heat tolerance in wheat from wheat wild relatives to improve food security |
| **3** | **Harry Cagney** | Combinatorial metabolic engineering platform for the production of valuable compounds in the alga Euglena gracilis |
| **1** | **Alejo Mosqueira** | Psychedelic drugs and serotonergic modulation of functional connectivity in neuronal microcircuits |
| **3** | **Oskar Fields** | Enhancement of Omega-3 Production in the Microalga *Euglena gracilis* |

## 12.30-13.30 Lunch Break – LT4

## 13.30-14.30 Poster session (Year Two students)

Year two students have created academic posters of their research.

Year 2 students will be available by their posters during this time for questions.

Top 3 posters will be selected by Cuifeng Ying and Mark Christian .

| Poster number | Name | Poster title |
|---|---|---|
| 1 | **Mohammad Rohum Hossain** | Domain structures of KAT6A and KAT6B histone acetyltransferases |
| 2 | **Jeffy Joseph Vinohar** | Decoding glioblastoma invasion: the role of voltage-gated potassium channels and microtubes in post-surgical recurrence. |
| 4 | **Katie Hawkins** | Wheat Wild Relative Introgression Lines as a Source of BYDV Resistance |
| 5 | **Ryan Duffy** | TrkC has distinct spatiotemporal dynamics compared to TrkA and TrkB |
| 6 | **Nana A. Berfi** | Harnessing C. elegans to Study Polymeric Nanoparticles in Drug Delivery |
| 7 | **Hannah McNeill** | It tastes sweeter when melted: Exploring the impact of food temperature on tongue temperature and perceived sweetness/vanilla |
| 8 | **Charo Luciana Molina** | Understanding the role of intercellular communication and its potential for the detection and inhibition of pre-metastatic cancer |
| 9 | **Rebecca Fairburn** | A trait Lost for Millions of Years: Resurrecting Root Hairs in Duckweed |
| 10 | **Sally O'Rourke** | Precision-targeting of pathogens using bacteriophage and antimicrobial peptides |
| 11 | **Kayley Chapman** | The enemy at the gates? To what extent do wildlife carry shared antimicrobial resistance? |
| 12 | **Daisy Stringfellow** | Characterising neuroimmune dysfunction in RNA foci disorders |
| 13 | **Thomas Dawson** | Attempting to isolate MAP genomes from complex samples using a metagenomic pipeline. |
| 14 | **Dani Vaughan** | TRIM25 and ZAP mediated antiviral inhibition of arenavirus replication |
| 15 | **Fisentzos Floras** | FMT treatment may prevent Clostridioides difficile infection-induced colorectal cancer through the restoration of ion channel activity |
| 16 | **Charlotte Parker** | Detecting Coronaviruses in UK Wildlife |
| 17 | **Matthew Maple** | Surface Modification of PEEK to Enhance Biocompatibility and Host Tissue Integration |
| 18 | **Zsuzsa Balint** | Uncovering the roles of tsRNAs in motoneuron function |
| 19 | **Oran White** | Structural and functional studies of antiviral transcription factor STAT2 |
| 20 | **Adam Vesely** | Investigating plant responses under nutrient deficiencies to molecules produced by soil microbiota |
| 21 | **Nguyen Khanh Giang Le** | Seal or not to seal? Understanding the regulation of plant root sealing system |

| Poster number | Name | Poster title |
|---|---|---|
| 22 | **Sophie McCann** | Investigating the role of extracellular vesicles in cancer-neurone communication |
| 23 | **Kwadwo Nketia Opoku** | Optimising Plant Symbiotic Bacteria Through Quorum-Sensing and Engineering Biology Approaches for Sustainable Nitrogen Fertilisation |
| 24 | **Harrison Leedham** | A molecular networking guided approach to novel natural product discovery |
| 25 | **Patricia Radu** | Psilocybin and reversal learning: initial dose finding study in male and female Lister hooded rats |
| 26 | **Peter Anthony Oyom** | Fighting Infection and Antimicrobial Resistance in Broiler Farming. |
| 27 | **Cerys Stock** | The Development of Bacteriophage as Bionanoparticles for Gene Therapy |
| 28 | **Carlos Sainz** | Development of a hiPSC derived multi-cell type organoid system to model particulate matter interaction in the lung |
| 29 | **Kamrul Hussein** | Identification of heterologous enzyme-substrate pairs for restoration of growth in mutant E. coli. |
| 30 | **Ivor Ilic** | A Hip Joint Replacement Design with a Wear Particle Control System |
| 31 | **Dean Joyce** | Assessing the Impact of Alternative Riparian Buffer Restoration Strategies on Leaf Litter Decomposition in Oil Palm Plantations |
| 32 | **Anna Lou-Hing** | Insights into structure-function dynamics of the archaeal DNA repair helicase Hel308 |
| 33 | **Srija Chakraborty** | Role of Post-translational modifications in controlling root angle in plants |
| 34 | **Megan Leadley** | Mechanism of action of sodium bicarbonate on oral biofilms |
| 35 | **Eryk Gadomski** | Airway Epithelial-Myeloid cell crosstalk as a key mechanism in the pathogenesis of Coronaviruses |
| 36 | **Rute Santos** | Epithelial EVs as modulators of immune responses to smoking and vaping |
| 37 | **Thanh Bach Nghiem** | Dissecting heat stress responses in barley |
| 38 | **Abdulqudus Ibrahim** | Roles of phytohormone biosynthesis in the virulence of Rhizoctonia solani |
| 39 | **Jacob Reed** | Utilising Quantum Sensing to Understand Mitochondrial Physiology under Varying Abiotic Factors |
| 40 | **Finlay Gale** | Understanding the Grafting Mechanism of Oxidised Phenolic Compounds onto Gum Arabic |

| Poster number | Name | Poster title |
|---|---|---|
| **41** | **Thomas Murray** | BATMAN: Breakpoint Adaptive Targeting alongside Methylation Analysis on Nanopore |
| **42** | **Joe Coxon** | RNA Processing in Malaria's Chloroplast |
| **43** | **Gabriel Sanderson** | Cross-incident light mixing for efficient up-conversion imaging using guided modes in metasurfaces. |
| **44** | **Ana Ferreira** | Lipid Accumulation in Feline CKD: Investigating the Origin of Lipid Droplets |

## 14.30-14.45 Coffee Break – LT4

## 14.45-15.30 Parallel Sessions

**Session 1 – Laura Hobley**

***In search of prey: polyamine usage by Bdellovibrio as a chemosensory ligand and regulator of bacterial predation.***

Growth of the bacterial predator *Bdellovibrio bacteriovorus* is dependent upon locating and consuming susceptible Gram-negative prey bacteria. Its bi-phasic lifecycle includes an extracellular free-swimming phase, during which efficient location of prey cells is essential to survival, and an intra-periplasmic growth phase, during which *Bdellovibrio* uses the prey cell contents to grow and replicate. Polyamines are cations made by all forms of life, including humans, plants, and many bacterial species. In bacteria they have been shown to be involved in regulating cell growth, biofilm formation and virulence. Our lab is interested in the signals that are involved in both of the phases of the *Bdellovibrio* life cycle. Together with our collaborators, we have shown that polyamines can act as a chemosensory ligand, and may allow *Bdellovibrio* to swim towards areas of high bacterial cell density. We have also shown that the synthesis by *Bdellovibrio* of one polyamine is required for timely completion of the predatory cycle. The chemosensory system of *Bdellovibrio* is complex and we are only just beginning to understand the range of signals that are sensed, whilst the regulatory networks underlying predation are equally complex. Our studies are beginning to elucidate each of these two systems in *Bdellovibrio* and are paving the way for further understanding of this complex, intriguing, bacterial predator.

**LT3**

**Session 2 – Lisa Chakrabarti**

***Mitochondrial physiology: in beasts from bench to benthos.***

The maintenance of appropriate cellular energy production is crucial for an organism to thrive. Eukaryotes gain much of their energy through the use of oxygen to drive specialised cellular organelles known as mitochondria. Mitochondrial dysfunction is associated with human diseases and ageing. In trying to prevent or reverse deleterious changes in mitochondrial physiology it can be instructive to understand how animals other than humans, manage cellular energy production to thrive and survive. We have examined mitochondria from model organisms such as mice and fruit flies, bats with exceptionally long lifespans and also Antarctic icefish - that live in extreme environments. We suggest that biological networks and pathways, identified in a variety of beasts, can be utilised to inform healthcare research to benefit lifelong healthy ageing.

**LT2**

**Session 3 – Stephen Lawrence**

***Brewing up yeast oral vaccines***

Vaccines have been the most successful intervention to respond to infectious diseases. An essential component of their development is the use of protein expression systems to produce recombinant subunit vaccines consisting of protective viral antigens. Yeast is a simple and cost-effective protein expression host, and yeast-based vaccines have gained popularity as they can be rapidly engineered to express foreign antigens and viral epitopes. In this talk I will review the potential and challenges of yeast oral vaccine delivery systems for animal infectious diseases.

**P04-P06**

(Please attend any session)

## 15.30-16.00 Closing session

Prize giving and closing remarks

Prizes will be awarded as follows:

**Year 1:** Top presentation in each session (6 prizes of £20 Amazon vouchers)
**Year 2:** Top 3 posters (3 prizes of £20 Amazon vouchers)
**Year 3:** Top presentation in each session (6 prizes of £20 Amazon vouchers)
**Year 4:** Top 2 3MT presentation in each session (4 prizes of £20 Amazon vouchers)
**Social Media Post winner:** Most creative social media post with conference hashtag (1 prize of £20 Amazon voucher)

## Close of conference