



**University of  
Nottingham**

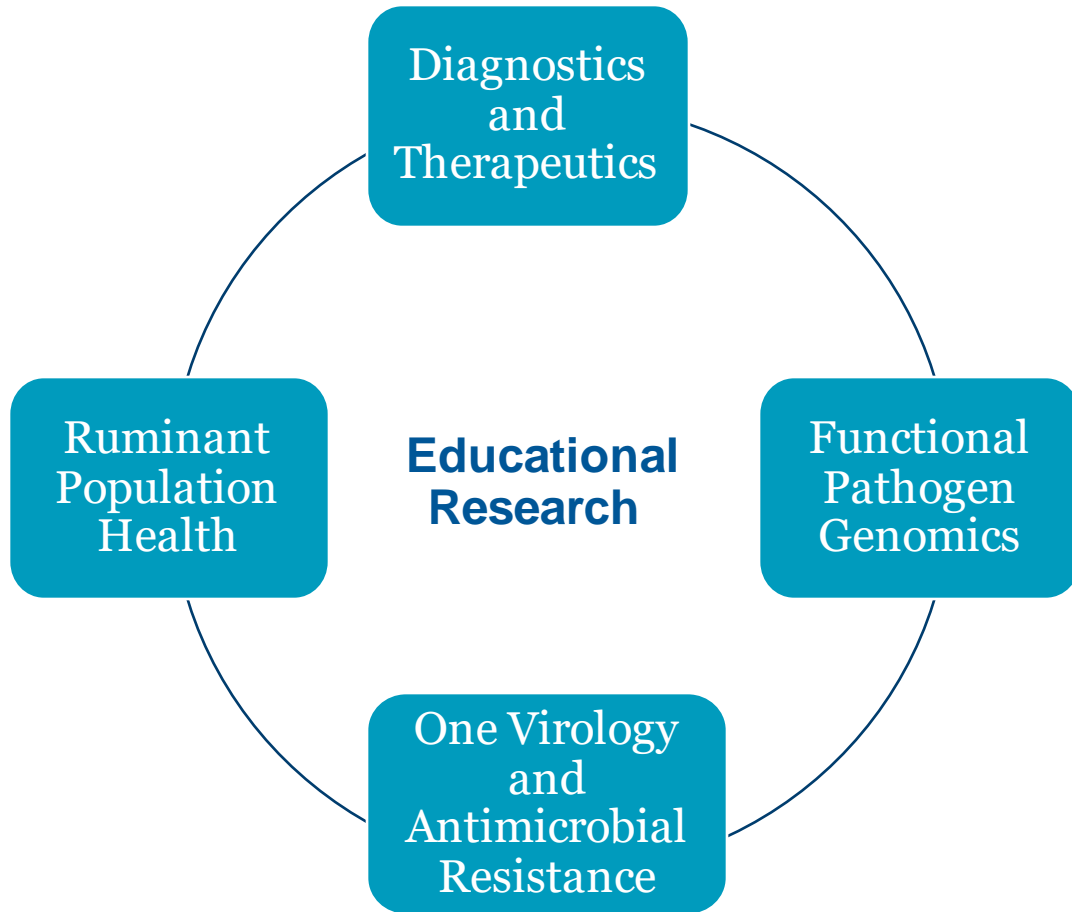
UK | CHINA | MALAYSIA

# **School of Veterinary Medicine and Science**

**Faculty of Medicine and Health Sciences**

**Professor Lisa Chakrabarti SVMS  
BBSRC DTP.**

**Associate Prof. Catrin Rutland Sub  
Dean of Postgraduate Research  
(drop-in sessions)**



Our Research

<https://www.nottingham.ac.uk/vet/research/index.aspx>

Our Academics

<https://www.nottingham.ac.uk/vet/people/index.aspx>

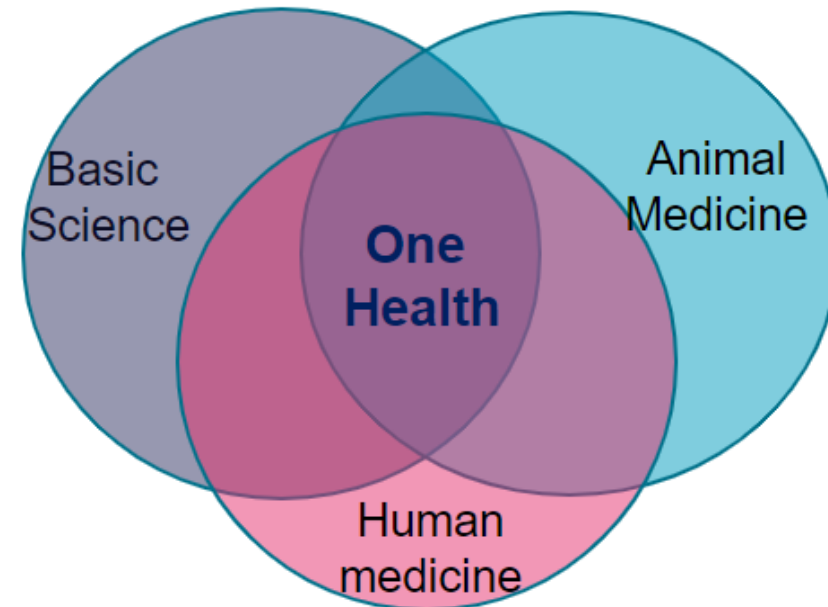
Postgraduate Research information

<https://www.nottingham.ac.uk/vet/study-with-us/postgraduate-research/index.as>

## School hosts UoN Centres of Excellence

- Centre for Applied Bioethics
- Centre for Dairy Science Innovation
- Centre for Evidence-based Veterinary Medicine
- Advanced Data Analysis Centre

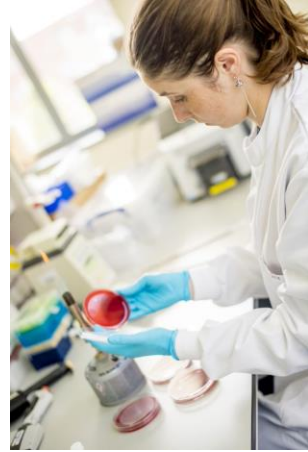
## Global Research





# Overview of Veterinary Medicine and Science

- ❖ Highest National Student Survey scores in the UK for 11 years
- ❖ High REF outcomes, Winners of Times Higher Education, Lord Dearing and Inspire Awards for student experience, teaching and research
- ❖ Accreditation RCVS (UK) and EAEVA (European) and AVMA (American)



- ✓ Comprehensive research training with outstanding facilities
- ✓ Pastoral and peer support including buddy system, welfare officer, 5 PG representatives and EDI champions plus representation on all SVMS committees
- ✓ Networking and socialising including summer and winter research conferences, social events
- ✓ Participate in teaching and outreach in addition to your research
- ✓ Dedicated administration team, sub deans, senior tutors, committee and research supervisors.

## PostGraduate Research Committee (PGRC)

### PGR Sub-Deans (non-clinical)

Catrin Rutland



### Sub-Dean (clinical)

David Gardner



### Continuing Education Officers

John Burford



### Continuing Education Officers

Rachael Humphreys (research)



Emma Palfreyman (taught)



### PGR Senior Tutors

Marco Duz (clinical)



Katie Wood (non-clinical)



### Welfare

Jo Flewitt



### EDI Champions (academic)

Hany Elsheika (clinical)



Jenny Jeyalapan (non-clinical)



### PGR Student Reps

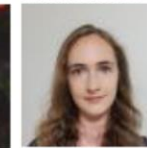
Caleb Marsh (EDI, PG)



Gunjan Katyal



Amelia Cameron



Shannon Ward



Olaolu (Tosin) Olufemi



### Reaching & Teaching, Divisional Representatives

Stuart Paine (R&T)



Vicky James (R&T)



Lisa Chakrabarti (R&T)



Steve Dunham (Virology)



Sharon Egan (Bacteriology)



Cinzia Allegrucci (Research Director)



### Current Rotating Members

Tania Dottorini



Ginny Sherwin



Laura Randall (dairyherd health)



Adam Blanchard (Early Career Rep)



Ageing, neurodegeneration and oxygen - does nature have an alternative to haemoglobin for us? Supervisor: Lisa Chakrabarti

Gene switches and treatment resistance in advanced cancer. Supervisor: Nigel Mongan

Understanding the role of extracellular vesicles in the regulation of RNA. Supervisor: Victoria James

Understanding the role of lysine methyltransferases in ovarian cancer progression and treatment resistance. Supervisor: Jennie Jeyapalan

Antisense transcripts as novel biomarkers involved in the pathogenesis of ovarian cancer. Supervisor: Cinzia Allegrucci

Advances in genetic mechanisms and pathway analysis towards diagnostic, prognostic and treatment opportunities for osteosarcoma. Supervisor: Catrin Rutland

Investigating the macrophage- mast cells cross-talk and its role in cancer. Supervisor: Anna Malecka

Cracking the Code: Structural Basis for Regulation of Gene Transcription in HIV. Supervisor: Aditi Borkar

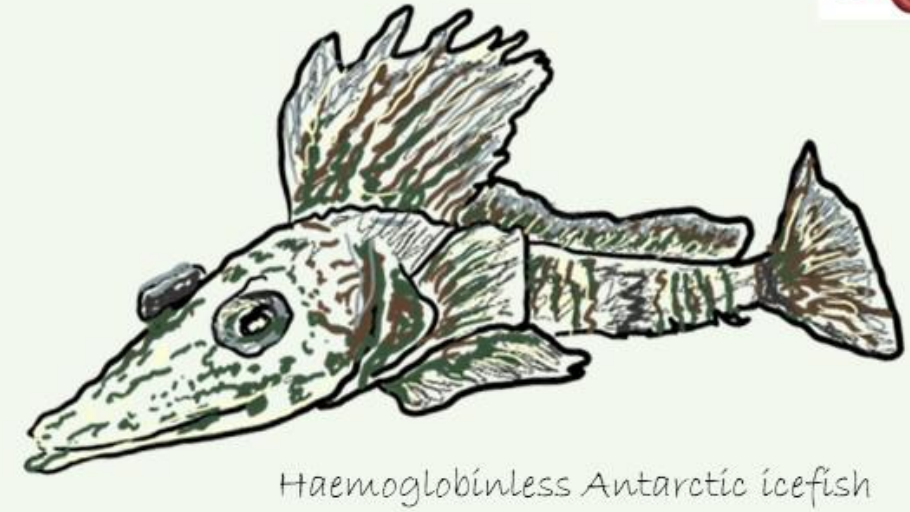
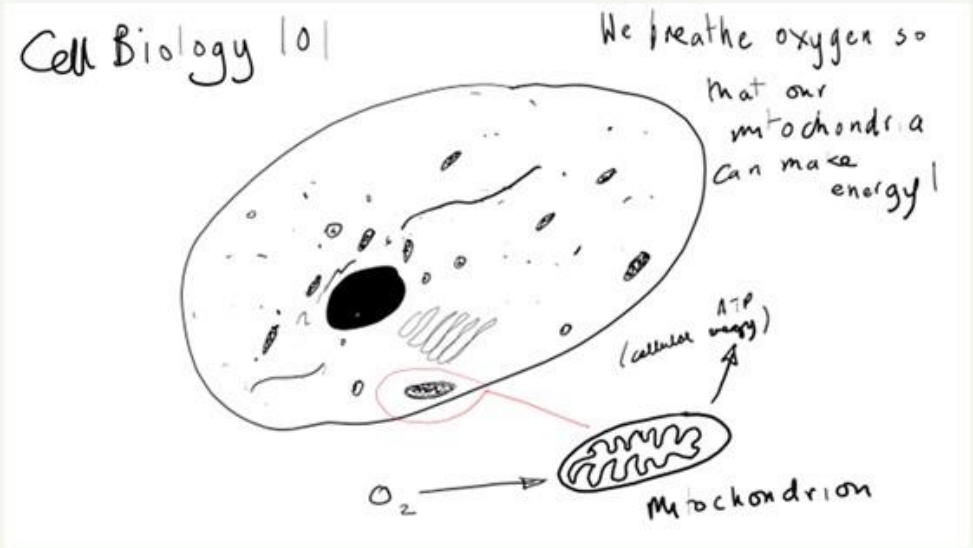
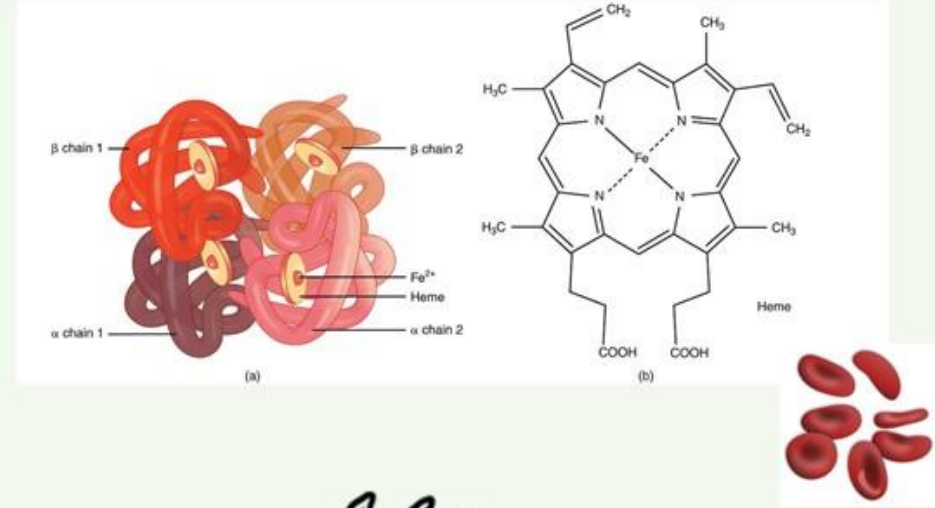
Towards the development of a pan-lineage vaccine: antigenic mapping of lassa fever virus glycoproteins. Supervisor: Janet Daly

Characterisation of equine asthma endotypes. Supervisor: Sarah Blott

Water or food: influence on seminal fluid characteristics. Supervisor: David Gardner



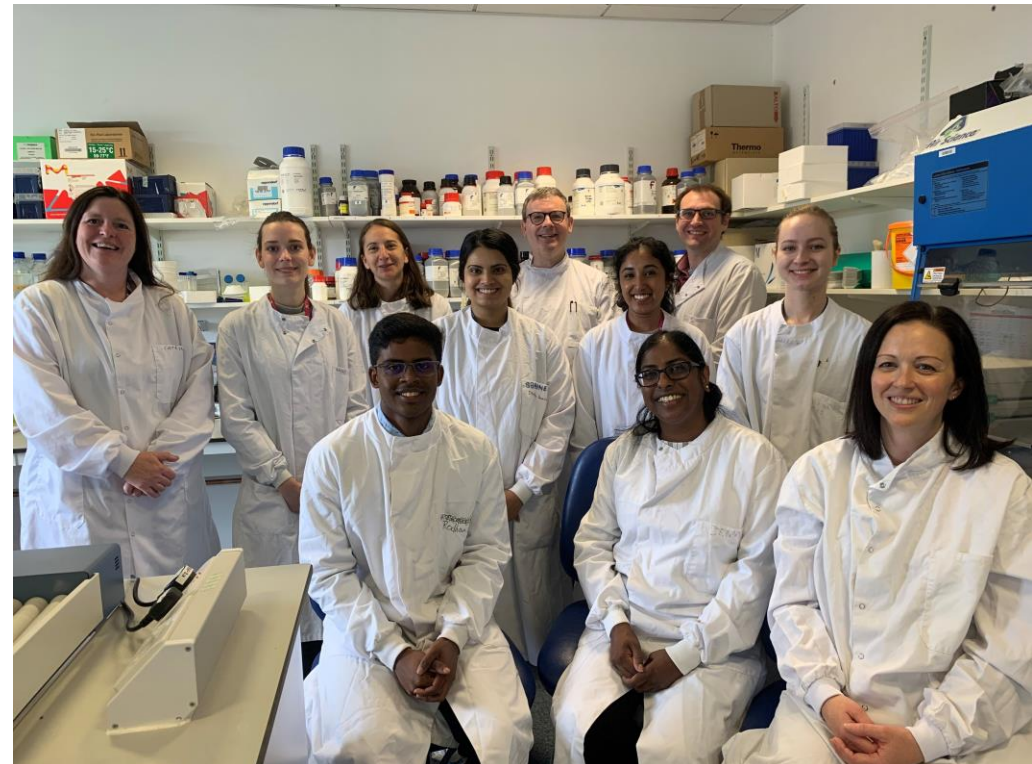
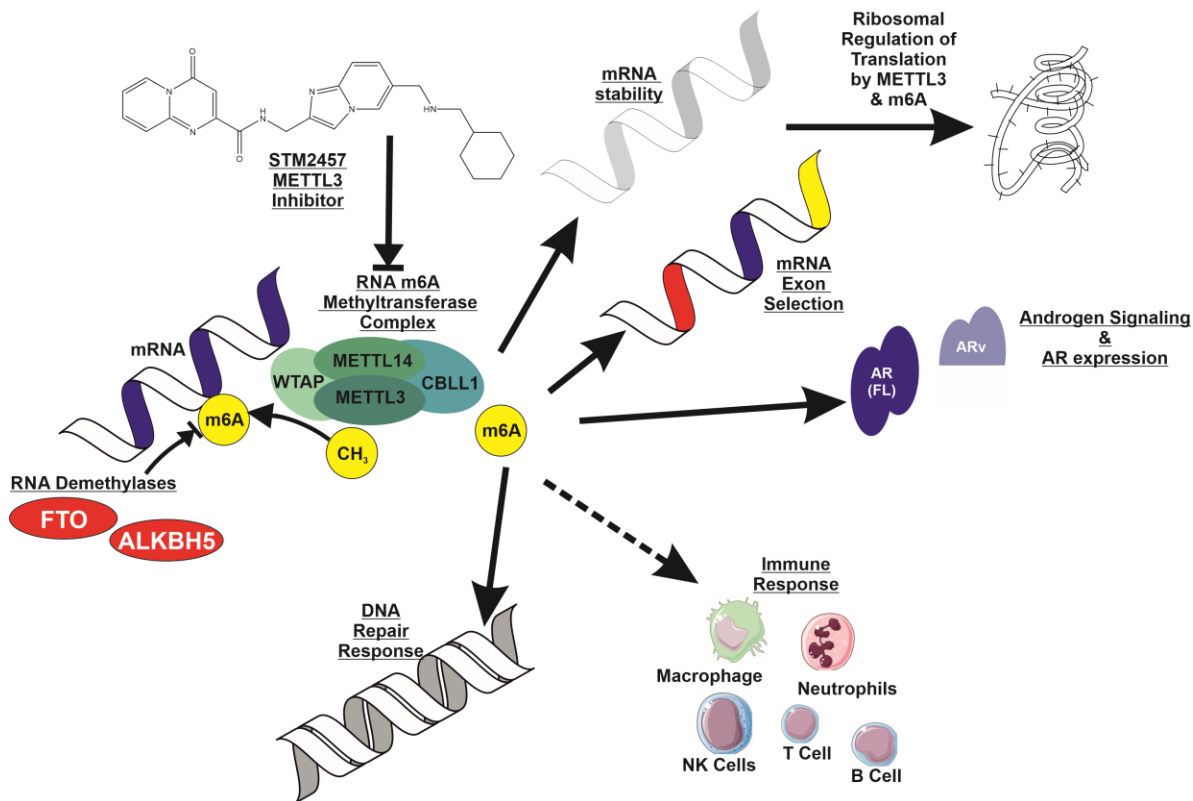
# Ageing, neurodegeneration and oxygen - does nature have an alternative to haemoglobin for us? Supervisor: Lisa Chakrabarti





# Mongan Group: RNA methylation and treatment resistance in Cancer

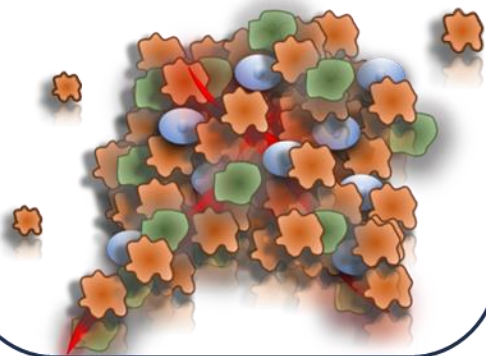
1. Your project will study how RNA methylation regulates gene expression in cancer and how this is involved in treatment resistance
2. RNA methylation is also involved in DNA repair, immune signalling and many other cellular processes
3. You will learn skills relevant to academia, pharma and biotech sectors, especially skills involved in preclinical drug development
4. You will be part of a vibrant and happy team based in BDI and will work with our international collaborators to do patient focussed research





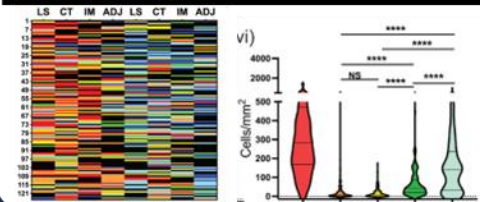
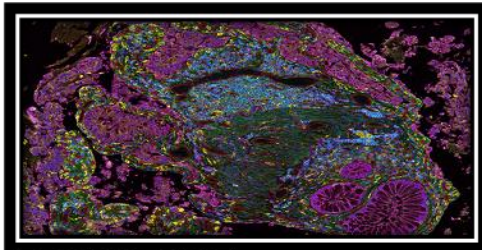
## Background:

Mast cells and macrophages are immune cells which act as first line of defence in response to infection or danger signal. They play key roles in directing immune responses, wound healing and angiogenesis. Mast cells and macrophages are present in cancers and have a proven role in cancer growth and resistance to therapy. Research demonstrated that mast cells and macrophages interact with each other in a variety of disorders in both a synergistic and antagonistic manner. We will investigate the macrophage-mast cell crosstalk in cancer with the aim to target it for therapeutic approaches.



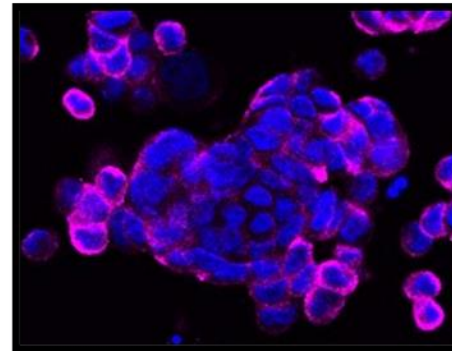
## Spatial biology:

We will use **Multiplex Fluorescent Immunohistochemistry (MFI)** to investigate the spatial distribution and characterise the phenotype of mast cells and macrophages in various cancers such as breast, brain and colorectal and their correlation with specific areas of cancer, for example cancer's invasive front. The data will be analysed using **trained AI** and **bioinformatics** to investigate cell distribution, their activation status and phenotype in correlation with patients' survival.



## Mechanisms governing cell crosstalk:

We will examine the mechanisms of cell-cell crosstalk and its effect in *in vitro* cell culture using **primary cells** and cell lines. We will look at the effect of co-culture on activation of intracellular pathways in macrophages and mast cells leading to secretion of pro- and anti-inflammatory, pro-tumour cytokines and extracellular vesicles, and expression of activation markers using a variety of laboratory methods including **ELISA, qPCR, Western Blotting, and Flow Cytometry.**



## Summary

This is a **Cancer Immunology** project focused on key immune cells in the cancer environment.

Understanding the macrophages-mast cells interactions in cancer will inform strategies to develop **novel therapeutics**

This **interdisciplinary** project combines **cutting edge** laboratory techniques with bioinformatics and artificial intelligence to decipher mechanisms of immune cells interactions in cancer.

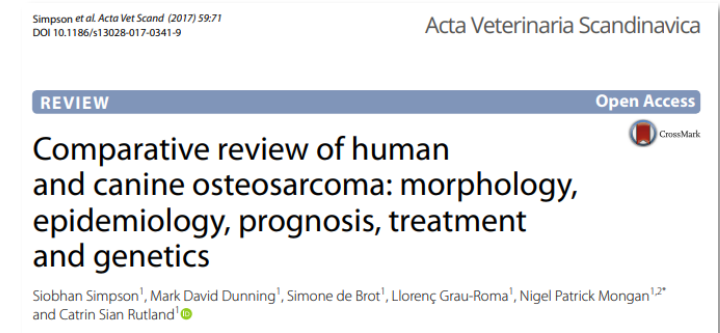
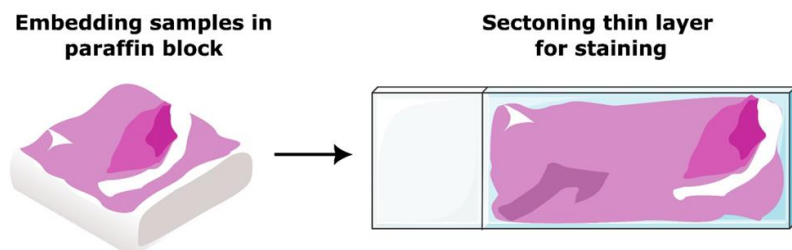
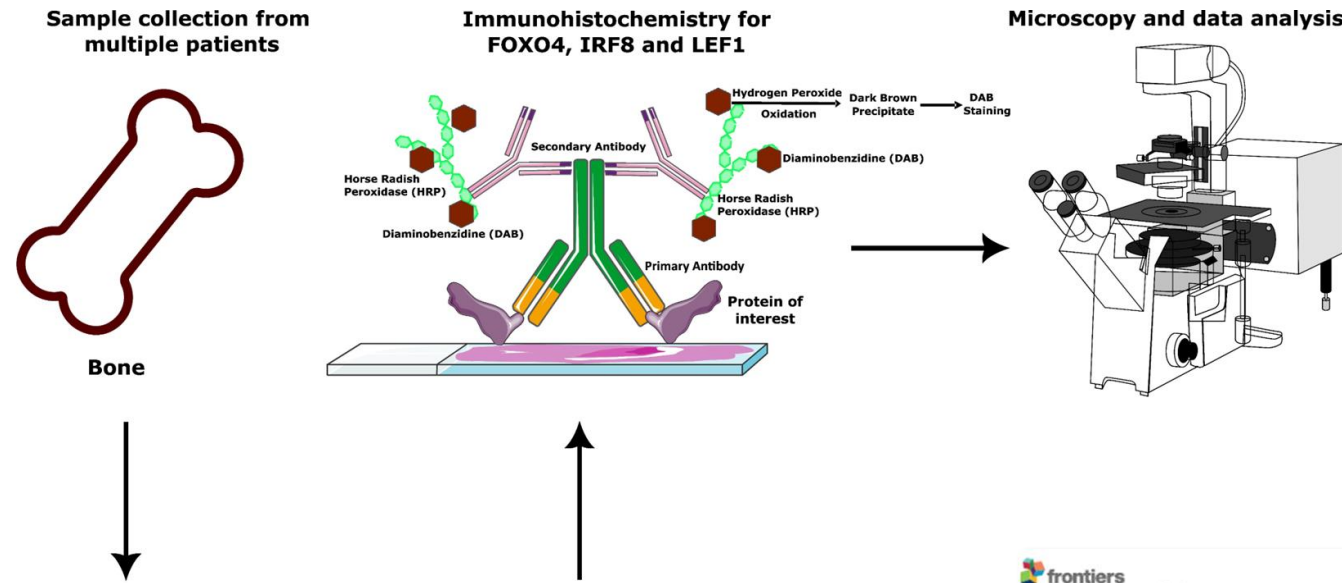
We are a **friendly lab** which includes multiple PhD students and research staff available to provide advice and **support.**



# Advances in genetic mechanisms and pathway analysis towards diagnostic, prognostic and treatment opportunities for osteosarcoma.

Supervisors: Dr Catrin Rutland, Prof. Nigel Mongan, Dr Jennie Jeyapalan

1. Your research will investigate the genetics and protein expression of osteosarcoma, looking for potential diagnostic and treatment targets.
2. You will learn laboratory and research skills including histology, genetics, cellular and molecular biology, and comparative medicine.
3. Our team includes international collaborators, and we have an outstanding international publications record in cancer biology.

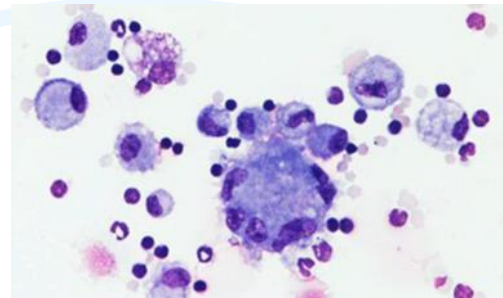


# Characterisation of equine asthma endotypes

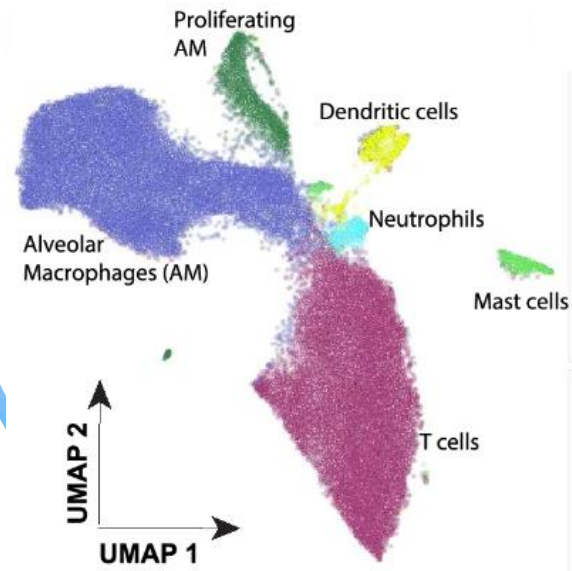
Supervisors: Dr Sarah Blott, Professor Janet Daly, Dr Nathan Archer



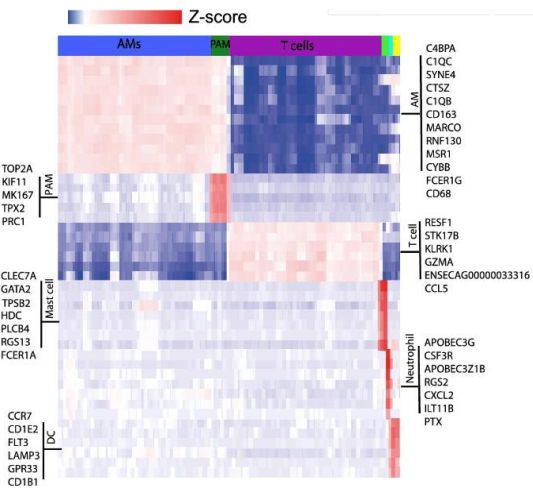
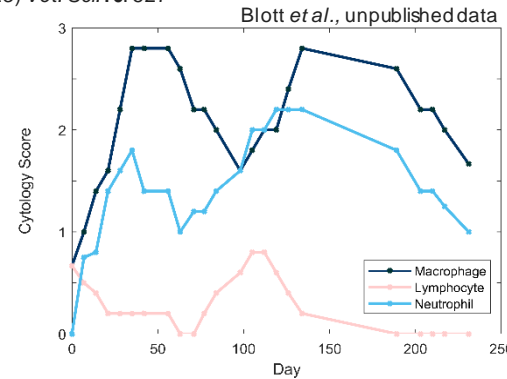
Flexineb® nebuliser



Morini *et al.* (2023) *Vet. Sci.* 10: 527



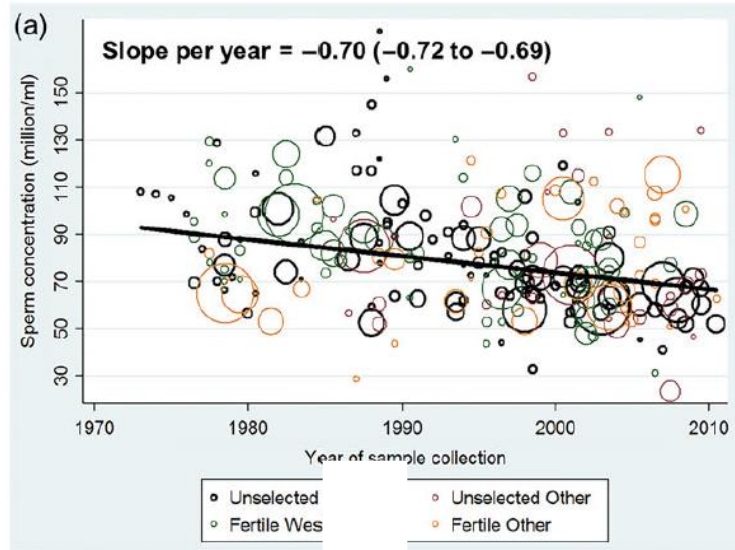
Riihimäki *et al.* (2023) *Sci Rep* 13: 16261





# WATER OR FOOD: INFLUENCE ON SEMINAL FLUID CHARACTERISTICS

## decline in male fertility



Project will investigate role of diet and water source **as influencers of male fertility.**  
Working with ...

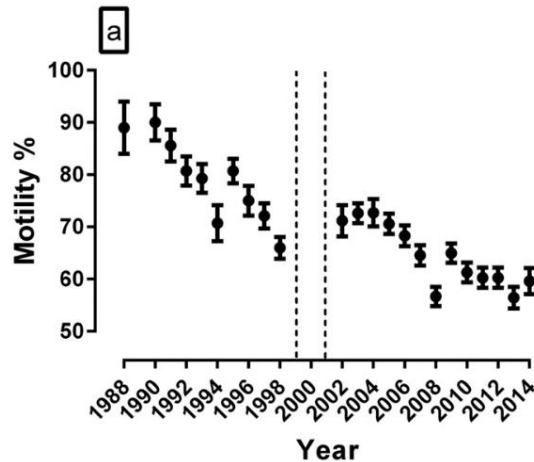


INDUZY LIFE

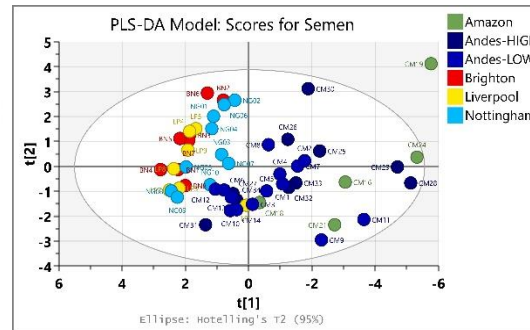
humans



Lab animals



canines

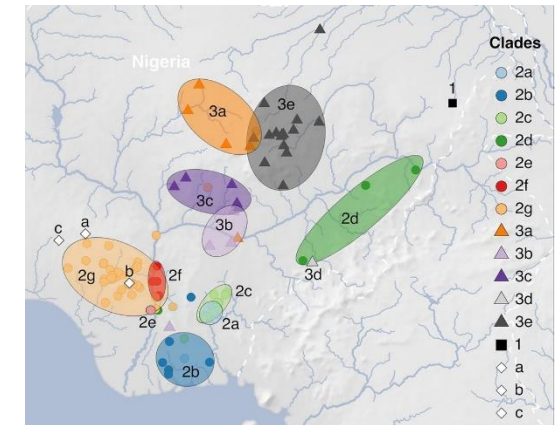




# Towards the development of a pan-lineage vaccine: antigenic mapping of Lassa virus glycoproteins

**Supervisory team:** Prof Janet Daly, Dr Toshana Foster, Prof Kevin Gough – all in SVMS

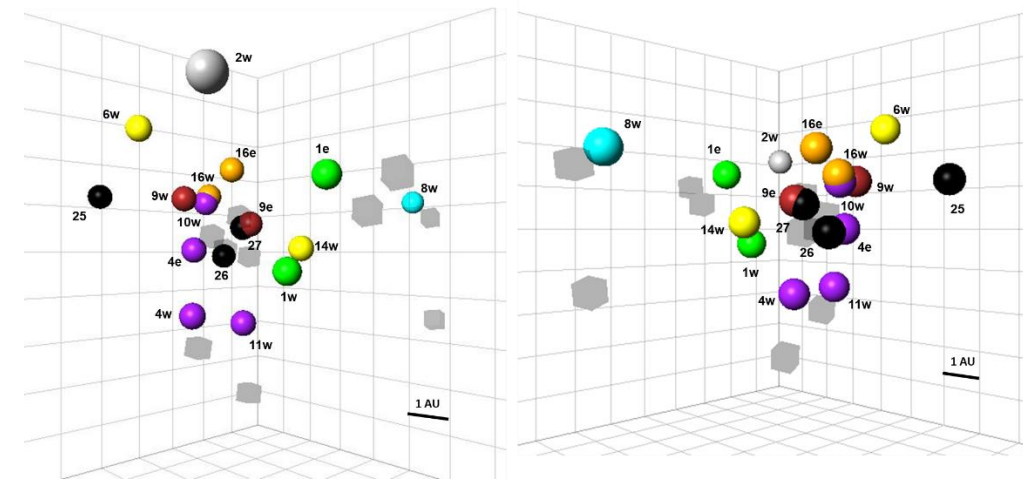
- Lassa virus (LASV), a member of the arenavirus family, causes an acute viral haemorrhagic illness in West African countries
- Working with collaborators in Nigeria who have studied the phylogeography of LASV (see map) we demonstrated differences in cell entry receptor usage across the 4 virus lineages



This project will expand on these initial findings:

- Are observed changes in cell entry linked to innate immune escape and/or inherent properties of LASV glycoprotein (GP) processing and host cell interaction, and do they correlate with a particular LASV lineage / geographical area?
- We also propose to generate a panel of single domain antibodies (VHH) against pseudotyped viruses expressing GP from viruses with cell entry differences by phage-display technology. These will be used to generate “antigenic maps” and ultimately identify antigenic sites that could inform vaccine design.

Ehichioya et al. (2019) *J. Virol.* 93: e00929-19.



Fay PC et al. (2021) *Viruses* 13:1455.



Coronaviruses in UK wildlife. Supervisor: Rachael Tarlinton

New potent antiparasitic agents against livestock resistant roundworms. Supervisor: Hany Elsheikha

The identification of novel methods for re-emerging Enterococci pathogen management in intensive poultry farming. Supervisor: Adam Blanchard

Understanding the role of *Porphyromonas asaccharolytica* in ovine footrot Supervisor: Rachel Clifton

Development and assessment of a novel sensitive method for the genetic analysis of complex traits. Supervisor: Cyril Rauch

One Health surveillance approaches to fight AMR using Artificial Intelligence and big data mining. Supervisor: Tania Dottorini

## **Biotechnology**

In-situ cryo-electron tomography of arenavirus entry pathways

Supervisor: Dr Toshana Foster



# Understanding the role of *Porphyromonas asaccharolytica* in ovine footrot

## Supervisors

Vet school:

- Dr Rachel Clifton
- Dr Adam Blanchard

School of Pharmacy:

- Dr Rian Griffiths

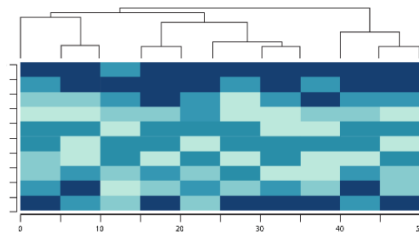
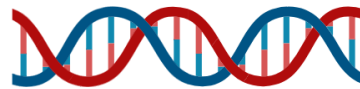
Nottingham Trent:

- Dr Sarah Kuehne

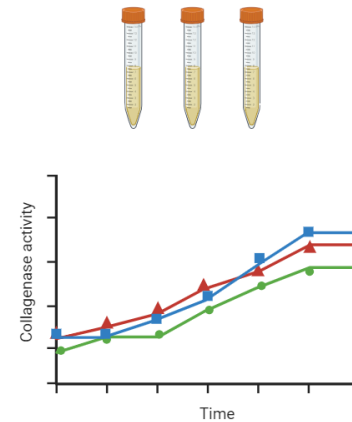
1. Develop collection of *Porphyromonas asaccharolytica* strains from ovine footrot lesions



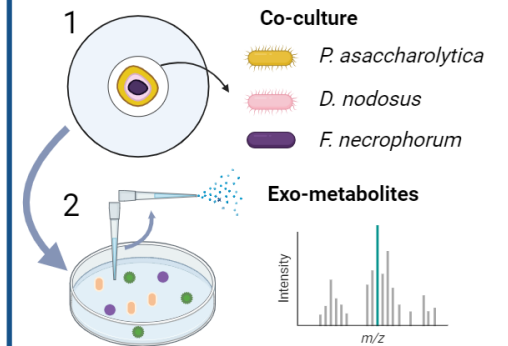
2. Whole genome sequencing and comparative genomics



3. Assay strains for protease activity



4. Explore interactions with known footrot pathogens







# In-situ cryo-electron tomography of arenavirus entry pathways

**Dr Toshana Foster, Dr Swetha Vijayakrishnan, Professor Janet Daly**  
(One Virology- University of Nottingham; MRC CVR, Glasgow)

## WHAT WE KNOW

frontiers  
in Microbiology

ORIGINAL RESEARCH  
published: 18 February 2022  
doi: 10.3389/fmicb.2022.840695

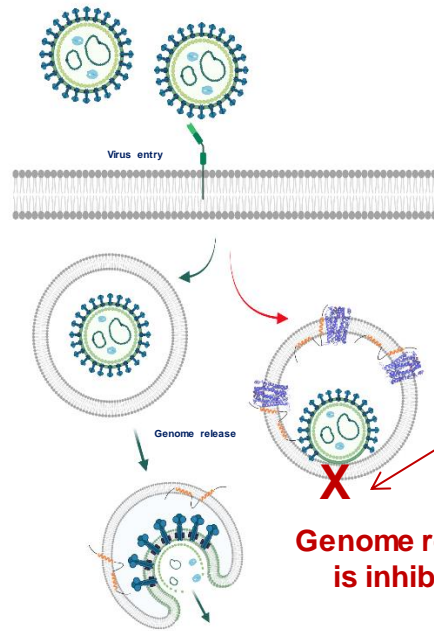


### Inhibition of Arenavirus Entry and Replication by the Cell-Intrinsic Restriction Factor ZMPSTE24 Is Enhanced by IFITM Antiviral Activity

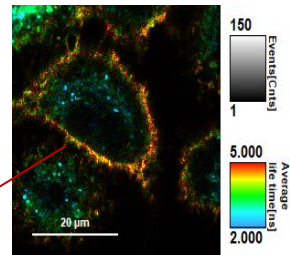
Robert J. Stott-Marshall and Toshana L. Foster\*

Faculty of Medicine and Health Sciences, School of Veterinary Medicine and Science, Wolfson Centre for Global Virus Research, University of Nottingham, Loughborough, United Kingdom

1. Arenavirus  
Virus  
engagement  
with receptors  
on cell surface



2. Fusion is inhibited by ZMPSTE24 and IFITM  
These proteins increase cell rigidity and block virus fusion



Fluorescence Lifetime Imaging microscopy (FLIM)

Genome release  
is inhibited

## WHAT WE NEED TO ADDRESS

**How is membrane architecture modulated by virus restriction factors?**

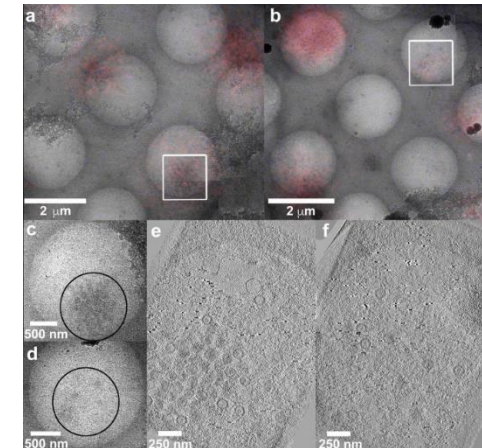
This interdisciplinary project will characterise the dynamic behaviour of arenavirus particles during the early stages of infection by:

**Cryo-correlative light and electron microscopy (cryo-CLEM)** to localize restriction factor proteins and virus particles

and by:

**Cryo-electron tomography (cryo-ET)** to visualise the dynamic process of virus entry and fusion

Cryo-CLEM and Cryo-ET will allow us to gain temporal and spatial information about changes in membrane structure during virus entry.





- School of Veterinary Sciences
  - General Enquiries – School PGR Administration, [SV-PG-VET@Nottingham.ac.uk](mailto:SV-PG-VET@Nottingham.ac.uk) Rachael, Charlotte or Emma, our postgraduate administrators, or Catrin Rutland our Postgraduate Research Sub-Dean will respond to you

Please feel free to email individual supervisors for each project/rotation too.





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**Do you have  
any questions?**