

# One Health at the University of Edinburgh



Achieving global impact through world leading research and training

## Open to a world of possibilities

- Exploring complex relationships between human, animal and environmental health
- Committed to multidisciplinary working in world leading Global Academies and research centres
- Collaborating to deliver research that influences global policy and contributes to saving lives
- Providing training in skills needed to respond to existing and emerging One Health challenges

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For more info:  
<https://www.ed.ac.uk/c/one-health>

# One Health Initiatives

- Baillie Gifford Pandemic Science Hub
  - Global Academy of Agriculture and Food Systems
    - Edinburgh Earth Initiative
      - Roslin Institute
        - AMR surveillance and diagnostics
          - Ion Bru – Scottish Nanopore sequencing group
            - Comparative models of disease
              - Blue Health
                - EPIC: One Health approach to disease outbreaks
                  - One Health networks
                    - Multidisciplinary training

## Edinburgh Infectious Diseases

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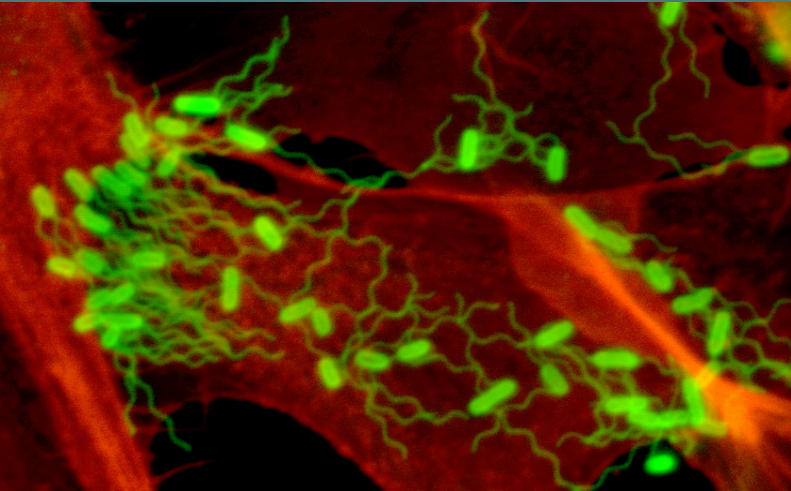
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# Edinburgh Infectious Diseases



Transdisciplinary network of >900 scientists, clinical, social and behavioural researchers

## Mission

- Represent the strengths of infectious disease science in Edinburgh
- Maintain a strategic overview of infectious disease research in Edinburgh
- Maximise synergy between established activities
- Promote innovation and translation
- Foster infectious disease teaching and training at all levels within the University

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[www.ed.ac.uk/edinburgh-infectious-diseases](http://www.ed.ac.uk/edinburgh-infectious-diseases)

# Baillie Gifford Pandemic Science Hub



Using genetics to find  
new therapies, fast

## Our aims

Bold in ambition to transform the speed of therapeutic innovation through inter-disciplinary collaboration:

- ✓ Genetics-fuelled discovery of effective drugs
- ✓ Rapid, efficient testing for efficacy in lungs
- ✓ Find effective treatments that make things better for patients

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[www.psh.ac.uk](http://www.psh.ac.uk)



# A Lens on Food Systems



Research, education and policy  
in the Global Academy of  
Agriculture and Food Systems

## OH challenges in food systems

- Conversion of natural habitats to farmland is a major driver of biodiversity loss
- Exploitation of wildlife and intensification of livestock production increase the risks of the emergence of zoonotic diseases
- Malnutrition and associated health challenges are widespread
- Risks of anti-microbial resistance arising from AM use in agriculture
- Food-borne pathogens are a common source of zoonotic disease

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For more info visit GAAFS:  
<https://www.ed.ac.uk/global-agriculture-food-systems>

# Edinburgh Earth Initiative



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**KNOWLEDGE  
FOR URGENT  
CLIMATE ACTION**

A world where our partnerships  
make a positive change in the  
communities most impacted by  
the global climate emergency

## EEI Activities

Key focus of activities  
addressing **Health in a  
Warming World**

- Research
- Philanthropy
- Student and staff  
experience – Earth  
fellows
- Enterprise and  
Innovation
- Events and workshops
- Health and Climate  
action Panel

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[www.earth.ed.ac.uk](http://www.earth.ed.ac.uk)  
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# One Health Genomics Edinburgh



Harnessing genome  
knowledge for global health  
of humans, animals, plants  
and ecosystems

## OHGE

- Community of >400 genomics researchers at UoE
- Cross-species, multi-disciplinary, multi-'omics
- Genomes, epigenomes, single-cell and spatial transcriptomes
- Massive compute and AI
- Industry collaborations with biotech and pharma
- Early Career Researcher programmes in Precision Medicine, Biomedical AI, Genome Analysis
- Addressing major societal challenges

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For more info please contact  
[genomics\\_network@ed.ac.uk](mailto:genomics_network@ed.ac.uk)



# Rapid whole genome sequencing



**ION-BRU** – the Scottish Nanopore sequencing user group

## Aims

- **Networking**
  - Our biannual meetings bring together scientists from across Scotland
- **One health**
  - Our meetings expose members to research on a wide variety of species and encourage collaboration
- **Method development**
  - Our members share ideas and troubleshoot DNA extraction and sequencing methodology for a broad range of applications

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# Blue Health



Sustainable growth of the 'blue economy' has potential to feed the growing human population well

## Sustainable food

- Scotland has a rapidly growing aquaculture sector – it is the third-largest salmon farming sector worldwide
- Finfish and shellfish have high nutritional value, high resource use efficiency, and a relatively low carbon footprint
- Work at the Roslin Institute contributes to:
  - Genetic, genomic and gene editing technologies for disease resistance and productivity
  - Fish health and welfare
  - Promoting the role of aquaculture in human nutrition
  - Promoting responsible innovation and regulatory systems.

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<https://www.ed.ac.uk/roslin>  
<https://www.ed.ac.uk/global-agriculture-food-systems>

# Global Challenges: Antimicrobial Resistance



The Edinburgh AMR Forum:  
Connecting researchers and  
clinicians across Edinburgh

## Key expertise

The Edinburgh AMR Forum  
brings together a vibrant  
community of over 200  
researchers tackling AMR

- Global and local epidemiology of AMR
- Rapid diagnostics of more effective use of antibiotics
- Mechanisms of biology, evolution and physics underpinning antibiotic resistance
- Antibiotic alternatives and vaccine development
- Antimicrobial resistance in fungi
- Antimicrobial governance and stewardship

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One AMR  
Network



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# One Health AMR surveillance



Supporting the development and testing of blueprints for a unified AMR surveillance in Uganda and Malawi

## Fleming Fund Fellowships

### Mission

To support the implementation and evaluation of National Action Plans through equitable training and research

### Partners



Uganda



Kenya



Malawi



Zambia

### Targets to 2025

1. 59 Fellows trained
2. 4 country-tailored OH surveillance plans
3. 12 AMR policy briefs
4. 8 peer reviewed publications

### Funding



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For more information scan





# EPIC: A One Health approach to animal disease outbreaks



The Scottish Government's  
Centre of Expertise on Animal  
Disease Outbreaks

## Key activities

- Interdisciplinary consortium across seven Scottish research institutions
- Well-established links with decision-makers
- Providing an evidence base for decision-making in “peacetime” (preparedness) and emergency (response) times:
  - Genetic analysis to track the spread of infectious disease
  - Mathematical modelling of disease outbreaks
  - Knowledge brokering between science and decision-makers e.g. risk assessment
  - Research at the wildlife-livestock interface (e.g. Avian Influenza)
  - Social research to understand human behaviour

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For more info visit <https://www.epicScotland.org/>



# Centre for Biomedicine, Self and Society



Spearheading interdisciplinary research in bioethics, social aspects of medicine, and the medical humanities

## Mission

- **Support** research in the social sciences of medicine and health humanities
- **Develop** innovative approaches to collaboration, stakeholder, and policy and public engagement related to biomedical practice, ethics, regulation and policy
- **Generate** rapid, insightful, and practicable analyses of current and emerging concerns in biomedicine and health
- **Engage** communities in thoughtful conversations about transformations in healthcare, biomedicine, and the social sciences and humanities

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Centre for  
Biomedicine  
Self and Society



<https://www.ed.ac.uk/usher/biomedicine-self-society>

# One Health and Society Network




Remaking One Health:  
Decolonial Approaches to Street Dogs and Rabies Prevention in India.

Special Issue Paper  
Zoonotic diseases: New directions in human-animal pathology

Robin Bendrey<sup>1</sup> | Debra Martin<sup>2</sup>

Abstract  
Zoonotic disease-human diseases of animal origin represent one of the world's greatest health challenges, both today and in the past. Since the Neolithic, zoonotic diseases have been one of the major factors shaping and influencing human adaptation. Archaeology is ideally situated to provide the long view on human-animal pathogen relationships through combining cultural, environmental and biological datasets, yet long-term studies of linked human and animal records have often been overlooked and underutilised. The seven papers in this special issue 'Zoonotic diseases, new directions in human-animal pathogen' cover a range of diseases caused by bacterial, viral, and parasitic pathogens, from case studies drawn from ancient Europe, Asia, Africa and the Americas. They speak to the diversity of human-animal-environment interactions that shaped disease emergence and transmission. They also review methodological advancements relating to disease identification and interpretation and discuss interdisciplinary approaches to effectively investigate these complex processes in the past. This introduction highlights their key themes and outcomes and identifies research activities moving forward.

Future Organisms  
Synthetic genomics and responsible innovation in the UK, the USA and Japan



Bringing critical expertise, insights and perspectives

## People and society

- Unique range of expertise: over 40 scholars from across the social sciences, arts and humanities disciplines with an interest in One Health challenges
- In depth knowledge on more than 20 countries in the Global North and South
- Experience of a wide range of innovative quantitative and qualitative research methods

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EDCMA  
SOMA



Contact – Dr Rebecca Marsland  
(r.marsland@ed.ac.uk)

# One Health Field Network



Uniting diverse and multidisciplinary expertise to enhance preparedness to risks to human, animal, and environmental health in complex contexts

## Enhancing preparedness in fragile contexts

The **FIELD SONGS** project highlights the intangible cultural heritage of Syrian refugees, aiming for sustainable development in the Middle East.

The **Türkiye-Syria Earthquake Rapid Needs Assessment** evaluates the impacts on human, animal, and environmental health resulting from the 2023 earthquake in Northwest Syria and Türkiye.

The **Aesthetics of Food Security** project investigates the aesthetic values, practices, and patterns that shape emotional responses to conflict and food insecurity in Syria.

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Academic  
Expertise  
for Sustainable  
Development



Achieving One Health  
through Food Security

دوران الثقافة وفن  
Douzan Art & Culture



Contact: Professor Lisa Boden (lisa.boden@ed.ac.uk)  
[www.onehealthfieldnetwork.com](http://www.onehealthfieldnetwork.com)



# One Health and wildlife



The health of wildlife and recovery of biodiversity recovery must be part of One Health frameworks

## Healthy ecosystems

- Wildlife can be reservoirs of important domestic animal or human diseases
- Domestic animal and human diseases are an important conservation threat to many wildlife species
- Disease emergence and spread is being driven by wider processes such as habitat loss, agricultural intensification, climate change, wildlife trade and persecution
  - Avian influenza virus in seabirds
  - Leprosy in red squirrels
  - Disease dynamics at the wildlife–livestock interface: Trypanosomiasis
  - Pathogen transmission between scimitar-horned oryx *Oryx dammah* and domestic ungulates

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# Zoonotic disease: Rabies



Taking interdisciplinary  
approaches to disease  
management

## Treating a killer

- Rabies is a zoonotic disease that kills ~ 60,000 people annually
- > 99% of human deaths are from canine rabies, 95% of which occur in Asia and Africa and mostly affect those in poverty
- Free-roaming dogs can transmit **zoonotic disease**
- Canine vaccination reduces human disease
- Working with in-country partners University of Edinburgh help develop new solutions, including:
  - Data capture tools
  - Rabies surveillance and in-country genomic sequencing
  - New vaccination approaches
  - Testing and evaluating dog population management strategies

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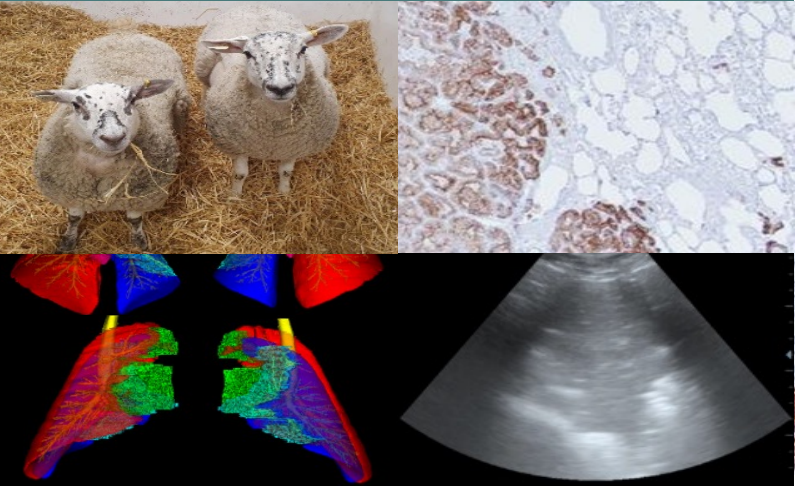


INTERNATIONAL  
RABIES TASKFORCE



Helen Fielding, The Roslin Institute (helen.fielding@ed.ac.uk)  
Fred Lohr, Mission Rabies (fred@wvs.org.uk)

# Developing comparative models of disease



Ovine Pulmonary Adenocarcinoma and human lung cancer

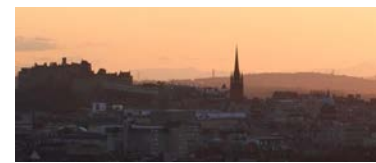
## Disease management

- **Ovine Pulmonary Adenocarcinoma (OPA)** is an infectious and fatal lung cancer affecting sheep
- OPA causes significant animal welfare and economic challenges throughout the world
- Many similarities between OPA and human lung cancer
- Development of a reliable pre-clinical OPA diagnostic test is a significant challenge
- Using the OPA model for human lung cancer studies has allowed:
  - Testing anti-cancer agents
  - Assessing novel imaging techniques
  - Development of new procedures

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Edinburgh Infectious Diseases



For more info contact Dr Mark Gray  
mgray34@ed.ac.uk; Roslin Institute

# Multidisciplinary training in One Health



Teaching and training provides the foundation for the implementation of One Health

## Education and training

- One Health workforce required to protect and sustain the health and well-being of life on earth
- Requires training in inter- and trans- disciplinary and systems thinking
  - values and attitudes
  - skills
  - knowledge and awareness
- Innovative educational programmes across the natural and social sciences, arts and humanities
  - Undergraduate
  - Postgraduate
  - Professional development

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# Doctoral Training in One Health



Interdisciplinary PhD programmes build expertise across fundamental, clinical, social and behavioural sciences to effectively address One Health

## Integrated learning

### Interdisciplinary PhD programmes:

- Hosts, Pathogens and Global Health
- One Health Models of Disease – Science, Ethics and Society
- Integrative One Health Solutions – joint with Leiden University Medical Centre

**Una Europa** – Igniting a University of the Future

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HP Hosts, Pathogens  
GH & Global Health  
Four year PhD Programme



One Health  
Models of Disease  
Science, Ethics and Society  
Four year PhD Programme



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# Edinburgh One Health and Una Europa



HELSINGIN YLIOPISTO  
HELSINGFORS UNIVERSITET  
UNIVERSITY OF HELSINKI



Universiteit  
Leiden



An alliance of eleven leading European research universities with global reputation and reach

## Una Europa

Una Europa aims to draw on collective strengths to create a truly European inter-university environment.

- Opportunities for students and staff to study, collaborate and research
- **6 key focus areas**
  - One Health
  - Data Science and Artificial Intelligence
  - Sustainability
  - Future Materials
  - Europe and the World
  - Cultural Heritage
- Leading inputs of **One Health** Self Steering Committee by University of Edinburgh

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More information

[www.ed.ac.uk/global/partnerships/networks-alliances/](http://www.ed.ac.uk/global/partnerships/networks-alliances/)

# Postgraduate Taught programmes



The University of Edinburgh offers wide range of on-campus and online courses that reach a global audience

## Topics

- Global Health
- Infectious Diseases
- Animal health and wellbeing
- Wildlife and conservation
- Environmental health
- Sustainability
- Food security and nutrition
- One Health



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# MSc in One Health: Dissertation projects



Examples of recent projects

## Projects

**At risk and vulnerable:** The hidden costs weighing on veterinarians dealing with ethically challenging situations

**Navigating turbulent waters:** Exploring the conversation surrounding Scottish salmon farming

**At the periphery:** Applying One Health to explore joint provision of human and animal healthcare in marginalised communities

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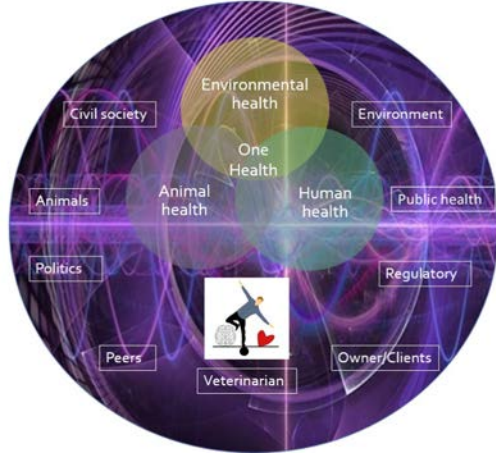
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# MSc in One Health: Dissertation project



**At risk and vulnerable:**  
The hidden costs weighing on  
veterinarians dealing with  
ethically challenging situations

## Key Findings

- Ethically challenging situations are common and stressful
- Violence is a potential hazard of veterinary work
- Secondary traumatic stress, burnout and PTSD occur in vets
- Hard to find balance in a world of competing demands and shifting responsibilities
- Vets value peer support and welcome training in veterinary ethics

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# MSc in One Health: Dissertation project



**Navigating Turbulent Waters:**  
exploring the conversation  
surrounding Scottish salmon  
farming

## Key Findings

- Narratives in the Scottish salmon sector on fish health and welfare, environmental impact and sustainability are highly contentious
- Stakeholder narratives are built through multiple fluid stories and lived experiences.
- Emotions, tensions and beliefs underpin individual narratives.
- Willingness to change is enacted through individual interpretation of the future, interpretation of power and the ability to influence and collaborate.
- Building a shared vision for the future of the sector rests not on the differences between narratives, but on how stakeholders understand and navigate each other's perspectives.

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# MSc in One Health: Dissertation project



**At the Periphery:** Applying One Health to explore joint provision of human and animal healthcare in marginalised communities

## Key Findings

- Up to 20% of people who are homeless have animals
- Animals can facilitate engagement with professionals

### ***Community healthcare needs:***

- Building trust
- Dealing with trauma
- Meeting needs of animals
- Maintain human-animal bond

### ***Healthcare challenges:***

- Stigmatisation
- Inconsistent support
- Incorporating third-sector
- Animals as barriers to accessing healthcare
- Collaboration of professionals is key to joint healthcare success

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