

Edinburgh  
Infectious  
Diseases



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# Annual Report 2023

*Professors David Dockrell and Sarah Reece, and Dr Hilary Snaith*  
*April 2024*



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## Summary

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- ◇ Edinburgh Infectious Diseases (EID) is the network of infectious disease researchers and clinicians in Edinburgh.
- ◇ The network connects over >1200 scientists (~950 within UoE), in >200 research groups, working in infectious disease research across the city of Edinburgh. It also includes colleagues in the Moredun Research Institute, Heriot-Watt and Edinburgh Napier Universities, Scotland's Rural College (SRUC) and NHS Lothian.
- ◇ The community was awarded £43.9M in research grant income in FY 2022/23. EID has co-ordinated major strategic bids for networks/centres in AMR/Epidemic Preparedness and Immune re-education in 2023/24.
- ◇ EID membership published over 400 papers in 2023.
- ◇ EID is a major contributor to teaching and training. It manages the WT DTPs in One Health Models of Disease (Roslin Institute) and Hosts, Pathogens & Global Health (School of Biological Sciences). EID also hosts the Leiden-Edinburgh Doctoral programme One Health Solutions to Infectious Diseases.
- ◇ EID is a major contributor to overseas partnerships. University of Edinburgh was confirmed as a Host Institute for Phase 2 of the Fleming Fund Fellowship Scheme to provide training in approaches to combat antimicrobial resistance to colleagues from Uganda, Kenya, Malawi and Zambia. This expands EID's partnerships with global partners already established through NIHR networks led by EID members through NIHR Global networks such as TIBA and RESPIRE.
- ◇ Communication and engagement activities include supporting an open annual lecture, an annual symposium and to multiple focused stake-holder events.
- ◇ EID is committed to making a positive contribution to our research culture. EID is working to give our ECR members a more prominent voice by contributing to EID's leadership and planning events.
- ◇ EID provides a model for cross-college activities at UoE and has been working closely with other networks e.g. Edinburgh Neurosciences, Edinburgh Genomics, Edinburgh Mental Health. As part of this work EID has developed a robust business plan to sustain EID and has mentored other networks to develop their plans.

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## Directors' message

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The last 12 months has seen a period of significant change for Edinburgh Infectious Diseases (EID). After 7 extremely successful years as director of EID, Ross Fitzgerald stood down as director of EID and Sarah Reece and David Dockrell were appointed joint directors in March 2023. This transition has offered a valuable opportunity for reflection and assessment. As part of this process we have had the opportunity to engage a range of stake holders including the leadership of each college, funders, industry, and crucially the membership of EID to review how EID can support the Infectious Diseases community in Edinburgh. As a result of this, EID's executive is starting to undergo some changes. We hope that this will extend EID's reach with greater engagement of areas where infectious diseases previously had limited visibility. It will also ensure that while still supporting the core activities which our membership values, EID will also have more capacity to engage in key strategic activities.

Over the last 12 months, EID has made major contributions to a number of strategic bids. The Anti-Microbial Resistance (AMR) forum has provided an effective springboard for a bid for a UKRI AMR network, led by Till Bachman. This has built upon Edinburgh links with external partners to develop a dynamic inter-disciplinary network centred on Edinburgh. EID targeted an analogous UKRI call to develop interdisciplinary networks to deliver research tackling epidemic threats. Sarah Reece led thematic workshops to stimulate cross-discipline integration and build teams, and supported subsequent bid development by a team from across CMVM and CAHSS. EID has also contributed to the MRC CoRE preliminary application led by David Dockrell to establish a centre to study immune re-education for infection. This is a joint bid that aligns immunology expertise across CSE and CMVM in collaboration with external partners in Oxford, Sheffield and Malawi. In each case EID's ability to work across colleges and draw on expertise from a range of disciplines and stakeholders has been instrumental to generating these bids.

EID continues to be central to teaching and training activities in infectious diseases. The Wellcome Trust DTPs in One Health Models of Disease and Hosts Pathogens and Global Health, which are administered by EID, have now enrolled its final cohort. On a smaller scale, EID continues to support the UoE-Leiden joint DTP in One Health Solutions to Infectious Disease whose students are entering the final stages of their PhDs. Our role in training goes beyond our own students as exemplified by securing Phase 2 funding for the Fleming Fellowship Scheme which

now encompasses Uganda, Zambia, Malawi and Kenya. This has given colleagues in a number of countries access to Edinburgh investigators and will help form future synergies.

Early career researchers are central to all EID's activities. As we start to implement a series of changes, one area we are keen to embrace is giving our ECR colleagues more opportunities to engage in all aspects of EID's operations and strategy. Consequently, several ECR members have recently joined EID's committees and working groups. We also hope that this will have longevity and ensure opportunities for future leaders in infectious diseases to grow in the fertile environment that EID aims to continue to nurture in Edinburgh. Additionally, by expanding EID's committees and working groups, we hope to extend the scope and impact of EID's activities. We believe the metrics included in this report with respect to publications, grant capture, stakeholder engagement and policy activities speak to the collective strengths of the EID community and highlight the benefits of securing EID's future.

**Sarah Reece** (School of Biological Sciences) and **David Dockrell** (Centre for Inflammation Research)

Co-Directors, Edinburgh Infectious Diseases

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## About Edinburgh Infectious Diseases

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The membership of Edinburgh Infectious Diseases (EID) tackle topics as diverse as biomarkers of infection, delivery of healthcare in unstable settings, antimicrobial resistance, neglected tropical diseases, One Health, the evolution and ecology of infectious agents, host-pathogen-vector interactions, and discover and deliver novel therapeutics. Moreover, the breadth of the infection-related research landscape encompasses all of the UoE thematic priorities: health and disease, harnessing AI/data for public good and tackling the climate crisis.

The Edinburgh Infectious Diseases community has over 230 research groups and 1000 members across the University of Edinburgh, and partner institutions across the city including Edinburgh Napier and Heriot Watt Universities, the Moredun Research Institute, Scotland's Rural College and clinical colleagues in NHS Lothian. It is led by the academic directors Prof Sarah Reece, Chair of Evolutionary Parasitology in the School of Biological Sciences and Prof David Dockrell, Chair of Infection Medicine and head of the Centre for Inflammation Research. Sarah and David began this shared role in March 2023 when Prof Ross Fitzgerald at the Roslin Institute, stepped down as director in after 7 years in the post.

The directors are supported by an executive committee of senior leaders from across our network, and a Professional Services team comprising a Development Manager (Dr Hilary Snaith), a Projects Officer for the Fleming Fund Fellowship Scheme, (Ms Romana Gorjanc), a Postgraduate Taught and Projects Officer (Miss Jennifer Hurst,) and a Communications and Engagement Officer (Dr Liv Coombes).

EID members come from an array of different backgrounds, encompassing basic sciences, human clinical and veterinary scientists, hospital consultants, and the social sciences, arts, and humanities. The EID community contributes ~15% of the University of Edinburgh's research income and also leads a range of DTPs and capacity building initiatives in LMICs (e.g. through the Fleming Fund Fellowship Schemes). Since EID was formed in 2012, it has developed into a highly successful network with a unique capacity for blue-skies research and training that has immense societal and economic importance. EID is extremely well-regarded within the UOE, viewed as unique strength by other UK Universities and funders, and has an excellent international reputation for supporting its community.

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## Strategy and business case for Edinburgh Infectious Diseases

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At the last meeting of the Edinburgh Infectious Diseases Strategy Board in November 2022, a revised strategy for the network was discussed, which saw the subsequent adoption of the following revised aims: for the network:

Aim 1: Represent the strengths of infectious disease science in Edinburgh through engagement with our internal and external stakeholders.

Aim 2: Support and develop infectious disease research in Edinburgh, to maximise synergy between established activities and promote new avenues for investigation.

Aim 3: Foster infectious disease teaching and training at all levels within the University, including the development of new postgraduate initiatives and support for Early Career

EID identified AMR, One Health, Transmission Biology and Environmental Change as four strategic priority areas. We plan to initiate a review of these priorities with our membership and new executive over the coming months.

During 2023-2024 Edinburgh Infectious Diseases developed a business case laying out the strengths, aspirations, and funding position of the network. This was presented to the Heads of College in February 2024, and is included below in Appendix 7.

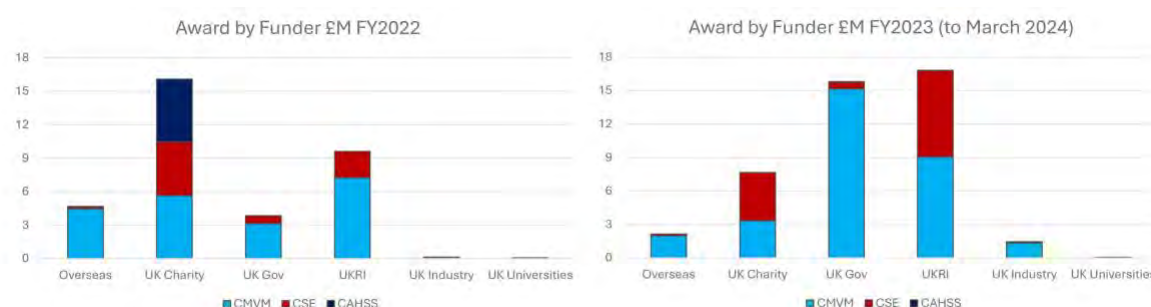
The following sections of this report describe the activities and outputs of the network in 2023.



## Edinburgh Infectious Diseases academic outputs

### Funding awards

A key metric of the recent success of Edinburgh Infectious Diseases members is in the level of external research funding awarded. In FY2022/23 University of Edinburgh members of EID were awarded £43.9M, and total is £34.4M for FY2023/24 (to March 2024). This compares to University of Edinburgh totals of £468M and £264M respectively.



Awards by funder to Edinburgh Infectious Diseases members at the University of Edinburgh

Is in previous years, the majority of research funding is awarded by UK charities, including Wellcome, the UK Government, and UKRI. Of the awards made, 19 are grants of >£1M, of which a selection are presented below. These awards have been made to individuals at all career stages, from ECRs to senior academics, as well as large team awards e.g. EPIC-4 led by Lisa Boden, Edinburgh Molecular Mechanism Cluster led by Kenny Baillie and RESPIRE-2 led by Harry Campbell. These also cover a range of disciplines and colleges e.g. Alice Street in CAHSS, Sander Granneman in CSE and CJ Andersen in CMVM.

Project Title	Funder	PI	Dept	Award (£)	Award Date
NIHR Global Health Research Unit on Respiratory Health (RESPIRE-2)	NIHR	Harry Campbell	Centre for Global Health Research	7544828	13/03/2023
After the single use: rethinking medical devices for reuse, renewal, and resilience	Wellcome Trust	Alice Street	Social Anthropology	5596131	18/03/2024
Inflammation and immunity driver programme	HDRUK	Aziz Sheikh	Centre for Medical Informatics	5038262	31/08/2023

Understanding the mechanism of chromosome segregation in the kinetoplastid parasite <i>Trypanosoma brucei</i>	Wellcome Trust	Bungo Akiyoshi	School of Biological Sciences	3613518	26/06/2023
iBreed: in vitro gametes for enhanced genetic selection of cattle	BMGF	Bruce Whitelaw	Roslin Institute	3383764	20/11/2023
Reprogramming human T cells for disease tolerance in <i>Falciparum</i> malaria	MRC	Phil Spence	School of Biological Sciences	2590816	20/10/2022
Punctual parasites: why is rhythmic replication advantageous for malaria parasites?	Wellcome Trust	Sarah Reece	School of Biological Sciences	2524867	27/11/2023
Cell death facilitates host-microbe communication in the insulted intestine	Wellcome Trust	CJ Anderson	Centre for Inflammation Research	2412720	31/03/2023
Dissecting macrophage regulation of lung epithelial regeneration	MRC	Christopher Lucas	Centre for Inflammation Research	2337323	24/04/2023
Time critical precision medicine for acute critical illness using treatable trait principles	CSO	Manu Shankar-Hari	Centre for Inflammation Research	2110861	04/01/2023
Uncovering the control of pathogenic herpesviruses by human and viral circular RNAs	Wellcome Trust	Takanobu Tagawa	School of Biological Sciences	1989593	09/08/2023
Edinburgh molecular mechanisms cluster	MRC	Kenneth Baillie	Centre for Inflammation Research	1883768	06/02/2024
Roles of a universally conserved DNA-and RNA-binding domain in controlling MRSA virulence and antibiotic resistance	MRC	Sander Granneman	School of Biological Sciences	1521112	13/11/2023
EPIC4 – Centre of Expertise on Animal Disease Outbreaks	Scot. Gov.	Lisa Boden	Global Acad. Agric. & Food Systems	1458319	10/08/2023

International Veterinary Vaccinology Network	MRC	Tim Connelley	Roslin Institute	1306006	24/11/2023
ISARIC CCP activation for acute hepatitis of unknown cause	MRC	Kenneth Baillie	Centre for Inflammation Research	1237408	14/09/2022
IRC next steps plus: photonic pathogen theranostics - point-of-care image guided photonic therapy of bacterial and fungal infection?	EPSRC	Kevin Dhaliwal	Centre for Inflammation Research	1101348	27/02/2023
Seven versus fourteen days antibiotics for patients with bronchiectasis requiring intravenous antibiotics-sbiva study	NIHR	Adam Hill	Centre for Inflammation Research	1097208	10/11/2022
When does a supershedder become a superspreader?: the impact of individual-level heterogeneities on population-level transmission and spread	NERC	Amy B Pedersen Wilson	School of Biological Sciences	1015005	08/03/2023

The list of all grants of >£500K awarded in FY2022/23 (to date) is given in Appendix 5.

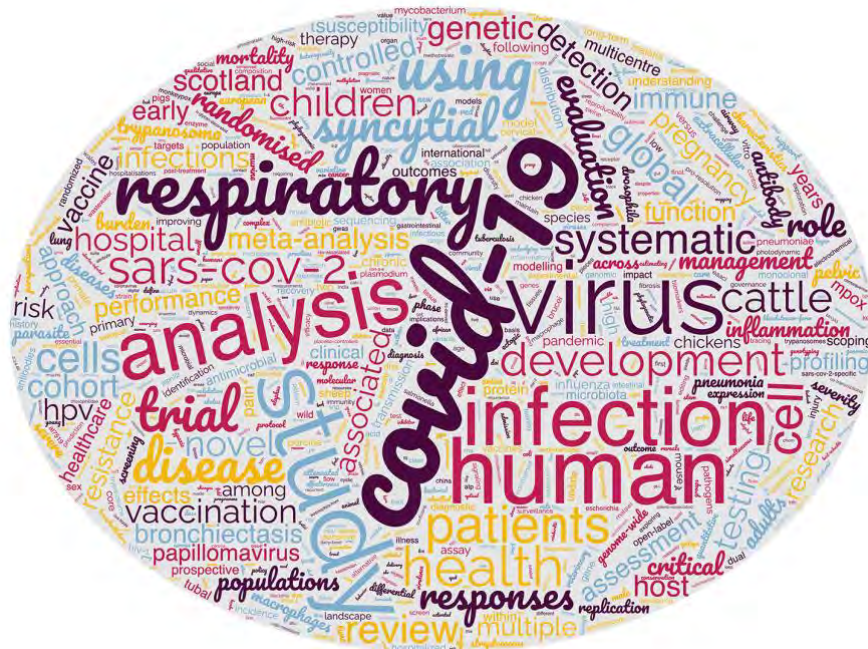
Edinburgh Infectious Diseases has contributed to the development of several major grant applications, including responses to the UKRI call for Transdisciplinary Networks to Address Antimicrobial Resistance (led by Prof Till Bachmann) the UKRI call for interdisciplinary research proposals to tackle epidemic threats (led by Prof Ann Bruce), and the MRC Centre of Research Excellence in Immunology (led by Prof David Dockrell, Centre for Inflammation Research and Prof Andrew MacDonald, School of Biological Sciences). All of these applications have drawn together researchers from across institutes and colleges, facilitated by the partnerships developed and nurtured by through the network.

## Publications

A key output of our research are the peer-reviewed papers and articles appearing in the scientific literature. In 2023 our members published almost 400 peer reviewed papers.



A word cloud analysis of the papers highlights the areas of key activities in addressing respiratory infections and disease caused by SARS-CoV-2.



A full list of publications from members obtained through PubMed is given in Appendix 6. Papers cover the full range of investigations of pathogens, host responses, population level interventions, policy engagement and implementation science.

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## Key network activities in 2022/23

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Edinburgh Infectious Diseases is responsible for the delivery of multiple key programmes focusing on teaching and training, and activities focused on communications and engagement. Particular emphasis has been given to support research development in One Health and Antimicrobial Resistance, including delivery of the Fleming Fund Fellowship Schemes throughout Phase 1 and securing Phase 2 funding.

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## One Health

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The recognition that the health of animals, humans, and the environment are critically interdependent is central to One Health. This is a key strength at the University of Edinburgh, which is highlighted in the new Research and Innovation Strategy 2030. In 2023, Edinburgh Infectious Diseases supported a number of activities that connected One Health researchers.

In March we hosted the Edinburgh One Health Symposium at the John McIntyre Conference Centre. This was a wide-reaching event connecting disciplines that are addressing the health of our planet, animals, people and the environment, through a lens of justice and equity. The programme is given in Appendix 2.



In May EID supported the OECD-CRP Symposium on AMR in Livestock Production in a One Health Context held at the Roslin Institute and the ECCI. The event was led by Prof Dominic Moran in the Global Academy of Agriculture and Food Systems, and brought key investigators from participants from across the world (above).

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## UK Mission to the EU Showcase on One Health

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In November 2023 members of Edinburgh Infectious Diseases, EID was invited to attend the One Health Showcase organised by the UK Mission to the EU in Brussels. This was a large event designed to highlight the scope of expertise in One Health at UK Universities. EID developed a showreel of key activities, poster presentations (see Appendix 1), and hands-on displays of point-of-care-diagnostics for antimicrobial resistance and real-time whole genome sequencing, showcased by Till Bachmann, Ross Fitzgerald, Hilary Snaith and Nat Ring. The event initiated valuable relationships and ongoing engagement with colleagues at the European Commission.

The One Health showreel and slideshow highlights can be accessed through the One Health at Edinburgh webpage:

[One Health at Edinburgh – Open to a world of possibilities](#)

## Una Europa One Health Steering Committee

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The Una Europa One Health Steering committee includes Edinburgh Infectious Diseases members Beckie Marsland, Amy Pedersen and Ross Fitzgerald representing the University of Edinburgh. In the last 12 months, general assembly meetings have been held in Leiden and Dublin and several joint initiatives have been developed among the 11 partner Universities for delivery in 2024-2025.

### [Una Europa One Health focus area](#)

In particular, the One Health Summer school will be hosted by the University of Helsinki this year. Further projects include a life-long learning initiative focussed on One Health in governance and a research project on One Health literacy. In addition, plans are underway for a research scoping workshop to be held in Edinburgh in June 2024 for Una Europa members with an interest in vector-borne disease and climate change, and this is expected to lead to a major collaborative grant application.

### [Una Europa Summer School, Helsinki, July 2024](#)

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## Antimicrobial resistance

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### [Edinburgh Antimicrobial Resistance Forum](#)

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The work with the Fleming Fund fellowship scheme is built on the wide base of research that is addressing Antimicrobial Resistance across Edinburgh. Activities across the network that address this key global challenge have been drawn together in the Edinburgh AMR Forum, led by Prof Till Bachmann (Centre for Inflammation Research). The Edinburgh AMR Forum has been instrumental in supporting development of funding applications, in particular in response to the UKRI call for Transdisciplinary Networks to Address AMR. The decision on the fund allocation for this call is expected very shortly.

An online seminar series to connect researchers from across the different University campuses was launched in the autumn of 2022, and continues bi-weekly with seminars given by group leaders, early career researchers and students. The series also hosted a number of external speakers in 2023. The programme was previously organized by Dr Katie Atkins (Usher Institute) and Helen Alexander (School of Biological Sciences). Since autumn



2023 the series has been hosted by Dr Grace Taylor-Joyce (School of Biological Sciences) and Dr Hannah Lepper (Usher Institute); an example of increasing leadership opportunities and visibility for ECRs. The full programme is available via the Edinburgh AMR Forum website:

[Edinburgh AMR Forum seminars 2023/24](#)

The Edinburgh AMR Forum also has worked with the coordinated seminars activities with the organisers of the Edinburgh Microbiology Forum (Nicki Lynskey, Perna Vohra and Bryan Wee), to ensure that maximum synergies are realised from linked and mutually beneficial activities.

### Fleming Fund Fellowship Schemes

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The Fleming Fund Fellowship Scheme is UK Government fund started in 2016 to provide support for capacity building in the surveillance of antimicrobial resistance in low and middle income countries. The Fund is channelled through the Department for Health and Social Care, to support three main funding streams – Regional Grants, Country Grants and the Fellowship Scheme – and operates in four geographical regions – Western Africa, Southern and Eastern Africa, South-East Asia and South Asia.

The University of Edinburgh has been a host institution for Fleming Fund fellows in the Southern and Eastern Africa region since 2019. The programme was previously led by Prof Ross Fitzgerald, and this role has now been passed to co-directors Prof Till Bachmann (Centre for Inflammation Research) and Dr Adrian Muwonge (Roslin Institute) supported by Dr Stella Mazeri (Roslin Institute) as deputy director. The grants awarded for this work in total have brought £3.8M to the University.

In Phase 1 of the activities, academic staff mentored 19 fellows from Uganda, Malawi and Kenya to develop knowledge and skills in AMR surveillance, laboratory management, data analysis and communication for policy formulation at local and national government levels. Significant collaborative projects were undertaken by the fellows and their UoE mentors in



all three countries. In Uganda the fellows piloted an approach to AMR surveillance in the community and hospitals, linking access to antibiotics for animals and humans, to levels of AMR in patients. The project in Malawi was based on the country's unique practices in poultry rearing, and studied the movement of AMR through the production chain.

*My professional journey up to this point has been defined by several pivotal experiences, with the Fleming Fund Fellowship standing out as one of the most significant. This unique fellowship connected me with an exceptional team of mentors from the University of Edinburgh, notably Dr Adrian Muwonge and Professor David Gally. Their collective expertise not only offered tailored career guidance throughout the fellowship but also extended far beyond its duration.*

Dr Ronald Chitatanga, AMR Surveillance Fellow, Human Health, Malawi

The fellows in Kenya worked with a media production company to develop an award-winning public engagement video highlighting the value of antibiotics and the need for their careful and appropriate use. In June 2023, the Malawi fellows visited Edinburgh in June 2023, to continue their research collaborations, attending the Edinburgh infectious Diseases symposium and



developing connections with colleagues at the Scotland-Malawi partnership (above). The fellows were accompanied by Dr Collins Mitambo, Director of Research in the Ministry of Health, pictured in the middle with Adrian Muwonge and Bruce Whitelaw, Director of the Roslin Institute.

*As the AMR Coordinator for Malawi, one of my key responsibilities is to establish sustainable frameworks within the Ministries of Health and Agriculture and build valuable professional networks. Our recent visit to the University of Edinburgh was an exceptional opportunity for me and the Fleming Fellows to expand our global connections. It provided valuable insights into the international collaboration fostered by the Edinburgh Infectious Disease team and the Scotland-Malawi Partnership. This enhanced understanding will greatly strengthen my capacity to effectively leverage our shared interests.*

Dr Collins Mitambo, Head of Research at the Ministry of Health, Malawi

The impact of the fellowship activities has been widely felt in each of the countries, with fellows directly contributing to improved development and implementation of AMR surveillance programmes, data from the collaborative projects directly informing policies in the National Action Plans for AMR.

*The Fleming Fund Phase 1 has been ground-breaking in terms of creating momentum for National Action Plans. In this regard, our Phase One has trained fellows across three pillars: Surveillance, Diagnostics, and Stewardship in Kenya,*

*Uganda, and Malawi – the collaborative research has allowed us to uniquely develop and pilot two blueprints for One Health AMR surveillance.*

Dr Adrian Muwonge, co-Director Fleming Fund Fellowship Schemes at UoE

Phase 2 of the Fleming Fund's activities were launched in the latter half of 2023. The University of Edinburgh will once again act as a Host Institute for the fellowship scheme, and work is well underway to bring on board the new cohorts of 10 fellows in Uganda, Malawi, Kenya, and also Zambia. The new fellows will build on the firm foundations already established in Phase 1, to ensure the continued and sustainable impact of the Fleming Fund investment through 2025 and beyond.

Particular thanks should go to Ms Romana Gorjanc, (School of Biological Sciences), the Project Officer supporting the Fleming Fund Fellowships for her tireless enthusiasm that ensures the effective and smooth delivery of the fellowship programme.

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## Postgraduate training

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### Wellcome Trust PhD programmes

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In addition to the ongoing UoE-Leiden University Medical School PhD partnership in One Health Solutions to Infectious Disease, Edinburgh Infectious Diseases continue to lead two Wellcome Trust PhD programmes: Hosts, Pathogens and Global Health, directed by Prof Keith Matthews (Biological Sciences) and Prof Mark Woolhouse (Usher Institute), and One Health Models of Disease, directed by Prof Ross Fitzgerald (Roslin Institute) and Prof Martyn Pickersgill (Usher Institute).

Both programmes attract students from across the world – 333 applications were received for entry to the programmes in 2023, and 433 in 2024. In February 2023 we recruited students from the USA, Poland, Colombia, Nigeria, Ukraine, Indonesia, Turkey and the UK. The cohorts who will join us in October 2024 are equally diverse.



We note with disappointment the decision of the Wellcome Trust to cease providing funds to support cohort based doctoral training programmes. However, EID is already exploring future doctoral training opportunities, for example, via very early stage discussions with Wellcome.



Seventeen students from the Hosts, Pathogens and Global Health programme (above) have successfully completed their studies, with all taking up postdoctoral level positions either in academia, research support, or clinical medicine. The first students on the One Health Models of Disease PhD programme (right) are due to complete their theses in autumn 2024.



Special thanks go to Jennifer Hurst, the Postgraduate Taught and Projects Officer for her dedication to the staff and students on the One Health Models of Disease programme.

### Ker Memorial PhD studentship

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In spring 2023 EID was very pleased to receive a gift from a long-term donor, Miss Aileen Ker. Miss Ker has been a donor to the University of Edinburgh since 1974, supporting an endowment in memory of her father and grandfather, both eminent Edinburgh physicians in the first half of the 20<sup>th</sup> century.

The new donation funded the 4-year Ker Memorial PhD collaborative studentship which is designed to initiate new collaborations between multiple research groups. Anna Davey was the successful candidate and joined Drs CJ Anderson and Chris Lucas in the Centre for Inflammation Research in November 2023, to identify focal points and functional relevance of host-microbe communication during tissue injury and repair.

### Symposia and workshops

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In 2023 we supported a significant number of symposia, workshops, lectures and industry visits that brought together participants from across the city, and showcased the expertise and excellence of infectious disease research in Edinburgh. As mentioned above, in March 2023 we hosted the Edinburgh One Health Symposium at the John McIntyre Conference Centre, and in May, EID supported the OECD-CRP Symposium on AMR in Livestock Production in a One Health Context held at the Roslin Institute and the ECCI.

In June, EID held its own annual symposium at the Royal College of Physicians Edinburgh, with the keynote Ker Memorial Lecture given Prof Carmen Buchrieser from the Institut Pasteur, talking about Pathogenicity related genomic features of Legionella. The Ker Memorial Prize for the best PhD thesis in infectious diseases in 2022 was awarded to Dr Verity Hill for her work with Prof Andrew Rambaut (School of Biological Sciences) on elucidating the dynamics of Ebola Virus and SARS-CoV-2. Five other outstanding students

were also nominated for the prize: Rosemary Blake and Clark Russell (Roslin Institute), and Heather Grant, Lisanne Knol and Kyriaki Neophytou (School of Biological Sciences).

We were also delighted to award the symposium prize for best student poster to Caitlin Jones (Centre for inflammation Research) for her work on the Contribution of Silent Carriers in the Epidemiology and Persistence of African Trypanosomiasis, and the prize for best postdoc poster to Rose Blake, (Roslin Institute) for her work on Genome-Scale CRISPR-Cas9 Knockout Screening in Avian Cells to Identify Host Factors Essential for Influenza Virus Infection. The winners are pictured here with Ross Fitzgerald and Carmen Buchrieser. The full programme for the event is given in Appendix 3.



We celebrated World AMR Awareness Week in November 2023 with a workshop in the Playfair Library dedicated to the rise of drug resistant fungal infections, bringing together



researchers and clinicians from across Scotland and the north of England. The programme was generously supported by sponsorship from OLM and Gilead. The event was led by Drs Beth Mills and Vasso Makrantonis from the Centre for Inflammation Research, and showcased a wide range of interests, approaches and opportunities for collaboration in AFR research. The programme is presented in Appendix 4.

November 2023 was a busy month, including EID's annual public Winter Lecture in the Anatomy Lecture Theatre delivered by Prof Sarah Cleaveland from the University of Glasgow presenting work from her outstanding career on One Health - Beyond Zoonoses (below). The Winter Lecture in 2022 took place on Monday 21 November, and was presented by Professor Frank Aarestrup from the Danish Technical University in Copenhagen. Frank's lecture was timed to coincide with World Antibiotic Awareness Week, and discussed "Beating the Silent Pandemic – Surveillance of Antimicrobial Resistance. These public events are key opportunities for wide engagement with world leaders in the field, as well as a highlight in the Edinburgh Infectious Diseases programme.



In collaboration with the One Health Genomics Edinburgh network (OHGE) led by Prof Tim Aitman in the Institute for Genetics and Cancer, we supported a visit by Oxford Nanopore Technologies (ONT) in February 2023. The visit showcased researchers and clinicians from across the University who are using ONT whole genome sequencing approaches to address surveillance, diagnosis, treatment and control of infectious diseases. It has also provided a springboard for ongoing interactions between colleagues in EID and OHGE, leading to a joint symposium later in 2024 on Infectious Disease Genomics.

In February 2024 EID was also involved in the high-level visit of Moderna to the University, with presentations made by a number of leading academics on opportunities for mRNA-based therapeutic approaches.

A summary of events is shown below:

Date	Event	Where
22 November 2022	EID Winter Lecture 2022 – Frank Aarestrup, Danish Technical University	Playfair Library, UoE
21/22 February 2023	Visit of Oxford Nanopore Technologies	Institute of Genetics and Cancer/Roslin Institute
30 March 2023	Edinburgh One Health Symposium	John McIntyre Conference Centre, UoE
20/21 April 2023	Student delegation Konrad Adenaur Foundation	Kings Buildings
22/23 May 2023	OECD AMU/R in livestock production	ECCL, UoE
22 June 2023	EID Annual Symposium	Royal College of Physicians, Edinburgh
27 June 2023	Building a One AMR network	Inst. Regeneration and Repair, UoE
8 September 2023	UKRI Epidemic Threats funding call	KB Nucleus, UoE
13 November 2023	EID Winter Lecture 2023 – Sarah Cleaveland, University of Glasgow	Anatomy Lecture Theatre, UoE
21 November 2023	WAAW – Fungal AMR Showcase	Playfair Library, UoE
22 November 2023	UK Mission to the EU One Health Showcase	Brussels
21 February 2024	Visit of Moderna – mRNA technologies	Inst. Regeneration and Repair, UoE



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## Communications and engagement

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Our members have previously told us about the importance of Edinburgh Infectious Diseases in providing a common connection for researchers across all three colleges. The need to engage effectively with both our internal and external audiences was recognised by the creation of a Communications and Engagement officer role within Edinburgh Infectious Diseases. We are very grateful to Dr Liv Coombes, who joined the network in August 2023, for her contributions. The new post has allowed us to further develop the scope and reach of our weekly newsletter, which now goes out to over 1000 readers, with details of infection related seminars from across the University, relevant events, and information about job vacancies.

We recognise that members of the EID network have cross-cutting interests that are common to other University-wide activities. We are now closely with colleagues in the Edinburgh Neuroscience, Edinburgh Mental Health, and One Health Genomics Edinburgh networks to facilitate coordination, share best practice, and identify opportunities for synergy.

We also continue to develop robust externally facing communication activities. The EID website continues to be a key vehicle for sharing news about key outputs and activities, and Twitter feeds for both Edinburgh Infectious Diseases and the Edinburgh AMR Forum continue to help us engage with a wide global audience.



In September 2023, the Cockburn Association were able to restart in-person activities for Doors Open Day. Edinburgh Infectious Diseases contributed to coordination of hands-on displays in the Ashworth Labs at Kings Buildings (left).

As part of EIDs commitment to building a positive research culture we believe it is important to highlight the opportunities for early career researchers in or community. A large number of our membership are ECRs who form a dynamic grouping with EID and are a major incubator for inter-disciplinary collaboration. EID is responsive to our memberships needs – ECRs will increasingly contribute to our management structures and are included on our executive committee.



Sarah Reece, and the Infectious Diseases Research Initiative Scotland (IDRIS, left) from which EID can partner with. EID also provides a network of mentorship and peer review for ECRs.

EID also engaged with visiting early career scholars from the Konrad Adenauer Foundation (left), who were undertaking a study tour of Edinburgh, exploring delivery of teaching and opportunities for careers in academia. Over their two-day visit, the students joined presentations and discussions with students, and academic and professional services staff, about their research, motivations and career development. They also toured the Genome Foundry and met with technologists in the facility.



We also plan to have greater involvement of ECRs in planning our activities, such as themed symposia and to design of our annual meeting. ECRs are invited to meet major external speakers and encouraged to engaged in networking opportunities with our visitors. There are several active templates for these endeavours as exemplified by the Scottish Parasitology Partnership in Research Innovation and Training (SPPIRIT), led by

## Appendix 1: Banners developed to showcase UoE One Health activities



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## Appendix 2: Programme for Edinburgh One Health Symposium

John McIntyre Conference Centre, Pollock Halls

Thursday 30 March 2023, 10 – 4 pm

Time	Who	Where	Title
10:00	Coffee and posters		
10:30	Martyn Pickersgill	Usher Institute	Welcome and introduction
10:35	Liz Grant	Global Health Academy	Planetary Health - One Health
10:50	Geoff Simm	GAAFS	One Health and Food Systems
11:05	Q&A		
11:15	Till Bachmann	Infection Medicine	AMR - the One Health paradigm
11:30	Sarah Chan	Usher Institute	Ethical One Health
11:45	Q&A		
11:55	Table discussion: One Health in Edinburgh (1), Liz Baggs		
12:15	Lunch		
13:15	Lukas Engelmann	School of Social and Political Science	Epidemy - learning from histories of epidemiological reasoning
13:30	Lisa Boden	GAAFS	One Health for pandemic preparedness
13:45	Q&A		
13:55	Geoff Banda	School of Social and Political Science	Local production of medicines, local health security and pandemic preparedness
14:10	Michael Eddleston	Centre for Cardiovascular Science	Preventing deaths from pesticide poisoning
14:25	Q&A		
14:35	Table discussion: One Health in Edinburgh (2), Anna Meredith		
14:55	Coffee and posters		
15:25	Corrine Reid	Former CAHSS Fellow, Global Health Academy	Ethical global research – Strengthening how we do research in complex and fragile settings
16:05	Reception and close		

## Appendix 3: Programme for 12th Annual Symposium

Royal College of Physicians, Edinburgh

Wednesday 22 June 2023, 9.30 – 5 pm

Speaker	Affiliation	Title
Session 1	09:30 - 10:50	
David Dockrell	Centre for Inflammation Research, co-Director of Edinburgh Infectious Diseases	Welcome and Introduction
Steve Sinkins	University of Glasgow	Mosquito symbionts for pathogen transmission-blocking
Clara Calvert	Usher Institute	Leveraging Scottish pregnancy, maternal and baby data in a pandemic: the COVID-19 in pregnancy in Scotland (COPS) study
Stella Mazeri* and Till Bachmann*	Roslin Institute and Centre for Inflammation Research	Fleming Fund: Capacity building to tackle AMR
Chihku Chimwaza*	Fleming Fund Fellow, Ministry of Health, Malawi	Surveillance of AMR in poultry production in Malawi
COFFEE AND POSTERS		
Session 2	11:20 - 12:40	
Meghan Perry	NHS Lothian	Clinical Infection Research Group
Thamarai Schneiders	Centre for Inflammation Research	Data Integrity & Ethics in infection research
Rennos Fragkoudis	Genome Foundry	The Edinburgh Genome Foundry: A Robotic Setup for High-throughput Bioengineering
Javier Santoyo Lopez	Edinburgh Genomics	Using the service
Eleanor Watson	Moredun Research Institute	Detection of zoonotic bacteria and AMR in grey seal populations
CJ Anderson	Centre for Inflammation Research	Symptom or participant? How death-induced dysbiosis influences intestinal repair
LUNCH AND POSTERS		
Session 3	13:55 - 15:25	
Ker Memorial Prize winner: Verity Hill	School of Biological Sciences	From epidemics to pandemics: Elucidating the dynamics of Ebola Virus and SARS-CoV-2

Andy Leigh Brown	School of Biological Sciences	Analysing HIV outbreaks in Scotland using viral sequencing
Sudeepa Abeysinghe	School of Social and Political Science	Global Health Governance and Pandemics
Jane Redford*	Edinburgh Innovations	Routes to Translation: Support from EI
Kiran Wadhawan*	School of Biological Sciences	How applicable is the Independent Action Hypothesis to various host-pathogen systems?
Matthew Burgess*	Centre for Inflammation Research	Helminth induced monocytes convey protection from respiratory syncytial virus infection
James Broughton*	School of Biological Sciences	Single-cell physiological response of E. coli to suppressive antibiotic combinations
Laura Confalonieri*	School of Physics and Astronomy	Assessment of pH changes for detection of bacterial growth and biofilm formation
James Baxter*	Usher Institute	Reconciling the Probability that HIV-1 Infection Is Initiated by Multiple Variants with the Rate of CD4+ Decline
COFFEE		
Session 4	16:05 - 17:00	
Ker Memorial Lecture: Prof Carmen Buchrieser	Institut Pasteur	Pathogenicity related genomic features of Legionella

\* short talks



## Appendix 4: Programme for WAAW Antifungal Resistance workshop

Playfair Library, Old College University of Edinburgh  
Tuesday 21 November 2023, 1 - 5 pm

Time	Speaker	Affiliation	Title
13:00	Till Bachmann	Edinburgh AMR Forum	Welcome and introduction
13:05	Gordon Ramage	Glasgow Caledonian University	Fungal biofilms: challenges to the antifungal pipeline
13:25	Kevin Hardwick	University of Edinburgh	Titan cells: chromosome mis-segregation and aneuploidy in <i>Cryptococcus neoformans</i>
13:45	Carol Munro	University of Aberdeen	Influence of antifungal induced cell wall remodelling on pathobiology of <i>Candida</i> species
14:05	Robin Allshire	University of Edinburgh	Epigenetic routes to antifungal/fungicide resistance
14:25	Alessandra Da Silva Dantas	University of Newcastle	Does fungal ageing impacts on development of antifungal resistance in <i>Candida</i> spp?
14:45	Coffee, cake and posters		
15:15	Iain Page	University of Edinburgh / NHS	The impact of antifungal resistance on the management of chronic pulmonary aspergillosis
15:35	Delma Childers	University of Aberdeen	The unintended consequences of antifungal adaptation
15:55	Ed Wallace	University of Edinburgh	Fungal cell wall regulation by RNA-binding proteins: an underexplored chink in fungal armour?
16:15	Marc Vendrell	University of Edinburgh	Chemical photosensitizers for targeted photodynamic ablation of resistant microbes
16:35	Beth Mills	University of Edinburgh	Rapid Point-of-Care Identification of <i>Aspergillus</i> Species in Microbial Keratitis
16:55	Till Bachmann	Edinburgh AMR Forum	Close
17:00	Networking reception and posters		

## Appendix 5: Grants of >£500K awarded to Edinburgh Infectious Diseases members at University of Edinburgh in FY2022/23

Project Title	Funder	PI	Dept	Award (£)	Award Date
NIHR Global Health Research Unit on Respiratory Health (RESPIRE-2)	NIHR	Harry Campbell	Centre for Global Health Research	7544828	13/03/2023
After the single use: rethinking medical devices for reuse, renewal, and resilience	Wellcome Trust	Alice Street	Social Anthropology	5596131	18/03/2024
Inflammation and immunity driver programme	HDRUK	Aziz Sheikh	Centre for Medical Informatics	5038262	31/08/2023
Understanding the mechanism of chromosome segregation in the kinetoplastid parasite Trypanosoma brucei	Wellcome Trust	Bungo Akiyoshi	School of Biological Sciences	3613518	26/06/2023
iBreed: in vitro gametes for enhanced genetic selection of cattle	BMGF	Bruce Whitelaw	Roslin Institute	3383764	20/11/2023
Reprogramming human t cells for disease tolerance in Falciparum malaria	MRC	Phil Spence	School of Biological Sciences	2590816	20/10/2022
Punctual parasites: why is rhythmic replication advantageous for malaria parasites?	Wellcome Trust	Sarah Reece	School of Biological Sciences	2524867	27/11/2023
Cell death facilitates host-microbe communication in the insulted intestine	Wellcome Trust	CJ Anderson	Centre for Inflammation Research	2412720	31/03/2023
Dissecting macrophage regulation of lung epithelial regeneration	MRC	Christopher Lucas	Centre for Inflammation Research	2337323	24/04/2023

Time critical precision medicine for acute critical illness using treatable trait principles	CSO	Manu Shankar-Hari	Centre for Inflammation Research	2110861	04/01/2023
Uncovering the control of pathogenic herpesviruses by human and viral circular RNAs	Wellcome Trust	Takanobu Tagawa	School of Biological Sciences	1989593	09/08/2023
Edinburgh molecular mechanisms cluster	MRC	Kenneth Baillie	Centre for Inflammation Research	1883768	06/02/2024
Roles of a universally conserved DNA-and RNA-binding domain in controlling MRSA virulence and antibiotic resistance	MRC	Sander Granneman	School of Biological Sciences	1521112	13/11/2023
EPIC4 – Centre of Expertise on Animal Disease Outbreaks	Scot. Gov.	Lisa Boden	Global Acad. Agric. & Food Systems	1458319	10/08/2023
International Veterinary Vaccinology Network	MRC	Tim Connelley	Roslin Institute	1306006	24/11/2023
ISARIC CCP activation for acute hepatitis of unknown cause	MRC	Kenneth Baillie	Centre for Inflammation Research	1237408	14/09/2022
IRC next steps plus: photonic pathogen theranostics - point-of-care image guided photonic therapy of bacterial and fungal infection?	EPSRC	Kevin Dhaliwal	Centre for Inflammation Research	1101348	27/02/2023
Seven versus fourteen days antibiotics for patients with bronchiectasis requiring intravenous antibiotics-sbiva study	NIHR	Adam Hill	Centre for Inflammation Research	1097208	10/11/2022
When does a supershedder become a superspreader?: the impact of individual-level heterogeneities on population-level transmission and spread	NERC	Amy B Pedersen Wilson	School of Biological Sciences	1015005	08/03/2023



Roles of a universally conserved DNA-and RNA-binding domain in controlling MRSA virulence and antibiotic resistance	MRC	Sander Granneman	School of Biological Sciences	876457	13/11/2023
Genetic modification of Rhipicephalus microplus as a population control strategy	Oxitec ltd	Tim Connelley	Roslin Institute	866536	31/07/2023
FLU-TRAILMAP (transmission and risk of Avian Influenza: learning more to advance preparedness)	BBSRC	Rowland Kao	R(D)SVS	864340	01/11/2023
Investigating ubiquitination-regulated cell cycle events underpinning malaria transmission	MRC	Nisha Philip	School of Biological Sciences	836546	13/11/2023
Sustaining action for gender equality SEBI-livestock	BMGF	Karen Smyth	R(D)SVS	827956	16/11/2023
Environmental drivers of senescence: an experimental test in the wild	NERC	Thomas Little	School of Biological Sciences	820285	25/08/2022
Empirical determination of the interaction landscape for temperature, CO2 and nitrate for a model diatom	NERC	Sinead Collins	School of Biological Sciences	788758	31/08/2022
Targeting B cells of the parietal pericardium to improve outcome post-myocardial infarction	MRC	Cecile Benezech	Centre for Cardiovascular Science	770733	19/04/2023
Predicting disease flare and treatment response in inflammatory bowel disease	UKRI	Charlie Lees	Centre for Genomic and Experimental Medicine	744489	13/09/2023
High-resolution ion mobility enabled dart/lc-ms for metabolomics applications	BBSRC	Thomas Wishart	Roslin Institute	715056	14/07/2023

Defining the physiology of E. coli O157:H7 in cattle to develop phage-based interventions	BBSRC	David Gally	Roslin Institute	612259	21/12/2022
Characterisation, determinants, mechanisms and consequences of the long-term effects of covid-19: providing the evidence base for health care systems	NIHR	Robin Flaig	Centre for Medical Informatics	594920	05/04/2023
Early vasopressors in sepsis (EVIS) trial	NIHR	Nazir Lone	Centre for Population Health Sciences	570536	22/03/2023
Are coinfections a threat to drug control programmes for livestock trypanosomes?	BBSRC	Keith Matthews	School of Biological Sciences	560800	29/06/2023
RESCEU: Respiratory Syncytial Virus Consortium in Europe	EC	Harish Nair	Centre for Population Health Sciences	533126	10/03/2023
Dissecting fatty acid metabolism in livestock trypanosomes	BBSRC	Pieter Steketee	Roslin Institute	507271	24/08/2023

## Appendix 6: Publications from Edinburgh Infectious Diseases members in 2023

1. Aboaja, A., Blackwood, D., Alvarado, R., & Grant, L. (2023). The mental wellbeing of female prisoners in Chile. *BMC Res Notes*, 16(1), 78. doi:10.1186/s13104-023-06342-x
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## Appendix 7: Edinburgh Infectious Diseases – strategic business case February 2024

### Executive Summary

Edinburgh Infectious Diseases (EID) is the network of infectious disease researchers and clinicians in Edinburgh (EID, Section 1). The network connects over >1200 scientists (~950 within UoE), in >200 research groups, working in infectious disease research across the city of Edinburgh. This community wins ~£40M grant income annually, accounting for approx. 15% of the UoE's total funding income. Further, the EID membership publishes > 500 papers annually, including a large proportion of REF returned publications and impact cases.

Since its initiation in 2012, EID has been instrumental in eroding the geographic barriers to communication and collaboration between researchers occupying different sites and affiliated to different Colleges. This connectivity underpins the increasingly broad expertise required to respond to funding calls and provides a focus for training and the sharing of best practice across sites and Colleges. EID has also identified key areas of interdisciplinary strength in One Health, AMR, pandemic preparedness, environmental change and health, and disease transmission and provides thematic expertise in these priority areas.

EID has been entirely self-funding for several years and this will continue until the end of the current financial year (FY23-24). EID will remain part-funded until FY25-26 and other investment is required to secure the posts that are essential to delivering EID's operations and to provide an operational budget. Here, we outline the case for supporting Edinburgh Infectious Diseases. We first provide an overview of EID's historic (Section 2) and proposed future financial support (Section 3) and then present the case for EID's value to the University of Edinburgh (Sections 5, 6).

For FY24-25 EID is seeking ~£126K, which rises to ~£169K in FY25-26, and we forecast maximum costs of ~£232 and £240K in FY26-27 and FY27-28 (Section 3). We outline plans to mitigate these costs via a range of mechanisms (Section 4) and note that EID has a good track record of fundraising. To meet any shortfall, we propose a split in contributions to EID across the Colleges that reflects the membership and the arrangement agreed when EID was founded (Section 3). This support will allow EID to maintain and modestly increase its staff base (Section 4) to continue to deliver its core activities while expanded its impact in existing and new areas that are highly fundable and key to all three of the UoE's priorities (Sections 5-6).

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## 1. About EID

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The membership of Edinburgh Infectious Diseases (EID) tackle topics as diverse as biomarkers of infection, delivery of healthcare in unstable settings, antimicrobial resistance, neglected tropical diseases, One Health, the evolution and ecology of infectious agents, host-pathogen interactions, and discover and deliver novel therapeutics. Moreover, the breadth of the infection-related research landscape encompasses all of the UoE thematic priorities: health and disease, harnessing AI/data for public good and tackling the climate crisis.

EID is led by the University of Edinburgh, with involvement from other strategic partners including the Moredun Research Institute, NHS Lothian, and Queen Margaret, Herriot Watt, and Edinburgh Napier Universities. EID members come from an array of different backgrounds, encompassing basic sciences, human clinical and veterinary scientists, hospital consultants, and the social sciences and humanities. The EID community contributes ~15% of the University of Edinburgh's research income and also leads a range of DTPs and capacity building initiatives in LMICs (e.g. through the Fleming Fund Fellowship Schemes). Since EID was formed in 2012, it has developed into a highly successful network with a unique capacity for blue-skies research and training that has immense societal and economic importance for the UoE. EID is extremely well-regarded within the UoE, viewed as unique strength by other UK Universities and funders, and has an excellent international reputation in delivering for its community (Appendix A).

EID is led by academic directors, currently Professors Sarah Reece (SBS/CSE) and David Dockrell (IRR/CMVM), supported by an Executive Committee of academics and a small Professional Services (PS) team, to develop, deliver, and evaluate activities and strategy (Appendix B). Ongoing investment is required to maintain EID's core activities (retaining the Professional Services staff in particular) and build a more effective community with increasing capacity to deliver for its members and stakeholders.

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## 2. Archaeology of EID's finances

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### 2.1 Funding

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In recognition of the expanding and world-leading portfolio of infection-research across Edinburgh, the three Colleges of the University of Edinburgh established EID in 2011-12 with an agreed funding split. The contributions were intended to cover 100% of both EID's staff and operational costs (~£50K per annum) and were distributed between the Colleges as £25K from CMVM, £20K from SBS/CSE, and £5K from CAHSS.

Records reveals that the SBS/CSE contributions started a few years after CMVM's and CAHSS have contributed less often. The contributions were increased in 2018 to cover increased salary costs and the split between the Colleges was altered to £32K from CMVM, £27K from SBS (CSE) and £3K

from CAHSS. However, these contributions have not been received since 2019-20 from CMVM, since 2018-19 from SBS/CSE, and the last contribution from CAHSS was in 2017-18 (table 1). College contributions were not sought after 2019 because surplus from external funding (Phase 1 of the Fleming Fund Fellowships Scheme, £1.2M) was sufficient to cover both EID's staff costs and its activities.

Table 1: Timing and value of college contributions to EID

period	CMVM		SBS/CSE		CAHSS		Annual
	value	%	value	%	value	%	
Dec-11	20,000	100		0		0	20,000
Dec-12		0		0		0	0
Dec-13	20,000	67		0	10,000	33	30,000
13-14	20,000	67	10,000	33		0	30,000
14-15	25,000	38	40,000	62		0	65,000
15-16	25,000	56	20,000	44		0	45,000
16-17	25,000	56	20,000	44		0	45,000
17-18	25,000	45	20,000	36	10,000	18	55,000
18-19	32,000	54	27,000	46		0	59,000
19-20	32,000	100		0		0	32,000
20-21		0		0		0	0
21-22		0		0		0	0
22-23		0		0		0	0
23-24		0		0		0	0
							381,000

In addition, philanthropic gifts and their modest annual income covers the annually awarded Ker PhD Prize and honorarium for the Ker Lecture which are presented at EID's summer symposium, and the Ker Memorial PhD Studentship awarded in 2023.

## 2.2 Current EID staff team

Both EID directors are SHEFC-funded and the PS team consists of 5 staff who deliver EID's community and research development activities, run two Wellcome-funded DTPs, and manage the Fleming Fund Fellowship Schemes (table 2). During FY24-25 we would like to move the two SBS-managed roles to open ended contracts because they are necessary for EID to operate (see Section 5 for justification), while ending the management of the R(D)SVS role by SBS by transferring it to R(D)SVS. In FY26-27 we anticipate needing to increase the Communications and Engagement Officer role to 1.0 FTE to cope with increased activities.

Table 2: EID's PS staff

PS staff role	Grade	FTE	School	Duration
Development Manager [Hilary Snaith]	UE08	1.0	School of Biological Sciences	Open ended
Admin and Projects Officer (PGT) [Jennifer Hurst]	UE05	0.8	School of Biological Sciences	Open ended
Communications and Engagement Officer [Liv Coombes]	UE06	0.5	School of Biological Sciences	Dec 2024
Project Officer (Fleming Fund) [Romana Gorjanc]	UE06	1.0	School of Biological Sciences	Dec 2025
Admin (PGR) [Elaine McDonald]	UE05	0.1	R(D)SVS	Jul 2024

### 3. Future planning

#### 3.1 FY 2023-24

Going forward, philanthropic monies will continue to cover the annual Ker Memorial-badged activities. We have also secured funds from the 2023 Scottish Funding Council International Science Partnerships Fund allocation of Overseas Development Agency (ODA) funds to cover 3 months of salary for each of the Development Manager and Fleming Fund Project Officer. Phase 2 of the Fleming Fund covers 100% of the FF Project officer's salary and 40% of the Development Manager's salary.

Thus, ODA funds plus underspend from Phase 1 of the Fleming Fund and a contribution from the Phase 2 Fleming Fund (which began in Jan 24) will fully support EID's staff and core activities, including the flagship Summer Symposium, supporting community-led activities such as seminar series, etc, ~£23K) during FY23-24 (table 3).

#### 3.2 Projection and proposal FY 2024-25 and beyond

Beyond July 2024, the PGR Admin role will either end or be handed to the R(D)SVS to fund and manage. For FY2024/25 this, leaves the need to fund 60% FTE of the Development Manager, 100% of the PGT Project Officer and the Communications Officer, as well as operations and activities. This results in the following projected costs (table 3).

Table 3: EID's cost projection. The jump between FY25-26 and FY26-27 is due to the end of the Phase 2 Fleming Fund and the increase in FTE of the Communications Officer. Note, the Phase 2



Fleming Fund's end date is conservatively set to 31 Dec 2025. It is expected that a no cost extension will be granted, releasing an already funded additional 2 months of salary for the Development Manager and Project Officer, which will bring the shortfall below the estimates cited.

PS staff role	2024-25		2025-26		2026-27		2027-28	
	total cost	shortfall	total cost	shortfall	total cost	shortfall	total cost	shortfall
Development Manager	69,668	41,801	72,069	60,057	75,672	75,672	79,456	79,456
Admin and Projects Officer (PGT)	34,824	34,824	35,510	35,510	36,794	36,794	38,045	38,045
Communications and Engagement Officer	25,779	25,779	26,295	26,295	53,641	53,641	54,714	54,714
Project Officer (Fleming Fund)	36,903	0	38,748	22,603	40,685	40,685	42,720	42,720
Staff costs	167,174	102,404	172,622	144,465	206,792	206,792	214,935	214,935
Operations and activities (+2%)		24,000		24,480		24,970		25,469
Total cost £		126,404		168,945		231,762		240,404

To help meet these costs, we propose that the Colleges resume the agreement made when EID was formed to underwrite EID's costs that are not secured by external grants or other sources of funds. We propose a 58% - 37% - 5% split between CMVM – SBS/CSE – CAHSS. The split reflects the level of infection-related activity in each College (membership %: 59 CMVM, 38.5 CSE, 2.5 CAHSS) while accounting for the upward trend in the inclusion of members from CAHSS that includes greater representation on the Executive Committee, more visibility during events, and bespoke support for applications (e.g. the UKRI epidemic preparedness bid that EID is mentoring is CAHSS-led). The split also recognises that SBS contributes to EID via administrative and management support in its research office and human resources as EID's host, even though the overheads associated with the PS staff included in Phase 2 of the Fleming Fund are received by CMVM. Thus, table 4 illustrates the maximum amounts required. These amounts are likely to be reduced in FY 2025-26 by a no-cost extension to Phase 2 of the Fleming Fund to compensate for its later than expected start date and by the fundraising activities planned ([Section 4](#)).

Table 4: Model for funding EID

	total cost £	CMVM 58%	SBS/CSE 37%	CAHSS 5%
2024-25	126,404	73,314	46,770	6,320
2025-26	168,945	97,988	62,510	8,447
2026-27	231,762	134,422	85,752	11,588
2027-28	240,404	139,434	88,949	12,020

## 4. Cost recovery plans

Underwriting EID will provide the security necessary to remain agile in all of its activities, which include seeking additional funding sources. To help defray the costs of underwriting (tables 3, 4), we already have short, medium, and long-term strategies to support both staff and operational costs.

### 4.1 Short term

As mentioned above, we have recently secured funds from the 2023 Scottish Funding Council International Science Partnerships Fund Overseas Development Agency (ODA) allocation and will target this scheme in 2024 (and in future years when SFC allocations are made) to support LMIC centred activities. Calls for these funds typically have short lead-in times which make this – and other schemes with short time frames – well suited to activities associated with those EID already has experience with or has well developed plans to undertake. In addition, we will follow up a tentative offer from the Moredun Research Institute to contribute to EID in recognition of having the largest share of the membership (~2%) of the non-UoE organisations.

### 4.2 Medium term

EID has secured and run two Wellcome DTPs (since 2015 and 2019) but unfortunately there is no prospect of Wellcome funding more DTPs in the near future. The funding landscape is increasingly including calls for networks but these are too specific in remit for EID to be their focus. Thus, we are working to build contributions for EID into other applications where EID can add significant value to activities, such as communications and training, project management, stake holder engagement, and networking. We are currently working with three teams to support bids (UKRI AMR network, UKRI epidemic preparedness network, MRC CoRe-IRE4I Immunology).

The MRC CoRE bid includes 0.1 FTE for EID's Development Manager and 0.4 FTE for a Communications Officer. The network bids are both two-phase opportunities with modest funding available for phase 1 and significant funding for phase 2. We will strive for phase 2 bids to include costs for EID to recover its initial investment in building the teams, application support, and running the topic scoping that underpins these bids. Furthermore, we aim to recover workshop and network

development costs where possible, for example, through priorities for Edinburgh Global, Data Driven Innovation, and Social Responsibility and Sustainability.

### 4.3 Long term

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With ERO, we will explore the option to cost a contribution to EID into infection-related grant applications as a “shared service” that provides and supports activities increasingly being required by funders such as career development/training, communication and engagement with stakeholders (including the public). This would be analogous to the standard procedures of requesting e.g. wash up, media making, maintenance of shared equipment, etc. This approach is particularly appropriate for applications that do not include the sort of costs that can be included for EID in network / consortia type bids. The total grant income awarded to UoE members of EID annually is ~£40M from >200 grants and this success is likely to increase following re-entry to Horizon Europe. Thus, even a modest contribution (e.g. £500 annually per grant could generate ~£100K). Similarly, given our plans to expand EID’s reach into institutes beyond UoE (e.g. SRUC) we will approach new partners for contributions too. Finally, an allocation from REF budgets might be appropriate because EID could be an exemplar for a Research Environment or Engagement statements for several returning units, whereas initiatives such as the “Growing Research Together” might contribute to EID as a pan-UoE initiative.

## 5. Need for EID PS staff roles

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EID undertook a strategic review in 2021 and restructured by creating new posts and upgrading other roles (B2). The new structure of the EID has embedded over the last few years and is transitioning well. Of particular note is the increased community and network building the Development Manager has undertaken (thanks to support from both the Comms and Admin Officers), and that this is translating to more funding bids. It is also impossible to overstate the added value that the current post holders bring to EID from their extensive knowledge of ‘who’s who’ within the UoE and beyond. This knowledge base can only be built via experience and will be retained by securing their posts.

As part of the Wellcome 4-year PhD programmes (DTP) applications made for the Hosts, Pathogens & Global Health programme in 2015 and renewed in 2019 (held by SBS), and for the One Health Models of Disease programme in 2019 (held by CMVM) the University of Edinburgh offered 0.4 FTE for admin and management support to each DTP. These roles have been performed by the Development Manager (for HPGH) and the Admin and Project Officer (for OHMD). Now these DTPs are in the final year of recruitment, the associated workloads will reduce year-on-year with the final cohort of students expected to complete in 2029. This will introduce scope for these roles to extend EID’s portfolio of activities (beyond those in Appendix A), which will stimulate an increase the volume of communications work required.

## 5.1 Development Manager, 1.0 FTE

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As well as overseeing the delivery of both of the Wellcome Trust 4-year PhD programmes, this post identifies, analyses and develops new research funding opportunities for EID. This includes providing targeted information on new funding opportunities to relevant staff, identifying teams, and exploring new ways to raise awareness to support the development of applications for novel funding sources in existing or new research areas aligned with UoE strategy.

This post requires leadership to co-ordinate applications, create academic teams that can respond to emerging funding calls, develop and delivering networking opportunities aligned with strategic themes, and evaluate how to support grass roots initiatives that align with EID's priorities. In 2023 for example, a cross College symposium explored the UoE capacity for One Health research, EID then produced visual resources to represent the UoE's scope and achievements in the One Health space at the UK Mission to the EU in Brussels, EID hosted a visit by students from the German Konrad Adenauer Foundation who wanted to explore the UoE as a model for higher education, and two academic teams have been assembled for UKRI network bids, plus a team for an MRC CoRE bid.

Furthermore, this role requires overseeing the co-ordination of EID's major current initiatives; the Wellcome DTPs, the Fleming Fund fellowship schemes, and the AMR Forum. Going forward, the increasing funding opportunities for targeted network and consortia bids are likely to increasingly occupy the Development Manager role, for example, horizon scanning to ensure EID can build agile teams to respond to opportunities and working such teams to support applications. By providing logistical, admin, and organizational support to bid EID will lower some of the barriers that teams face when developing applications.

## 5.2 Admin and Project Officer (PGT), 0.8 FTE

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In addition to a diverse array of tasks underpinning the day to day running of both of the Wellcome Trust 4-year PhD programmes, this role supports the Development Manager to assist with organising and delivering EID activities and curating its data. The administration tasks related to the OHMD DTP include considerable support of its taught components (it is a PhD with Integrated Study) comprising 180 credits (one quarter) of the final award. For both DTPs, this role supports staff and students, is responsible for assessment processes and exam boards, assists with student recruitment, and maintains all necessary records on Euclid and the VLE. As the workload associated with the DTPs reduces over the next 5 years there will be increasing scope for this role to support the Development Manager and Communications Officer in the delivery of an increasing repertoire of EID's activities.

## 5.3 Communications Officer, 0.5-1.0 FTE

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Like any network, EID relies on professional communications to bring in new people, build its own community, and to interact with stakeholders (especially the public). This role delivers work



undertaken by the previous role of the Executive Manager, including the internal communications and events promotion. By increasing this role to 1.0 FTE, it will increasingly support the membership to engage with stakeholders and deliver publicity activities alongside developing the social media presence of EID. Furthermore, a full time role is necessary to lead on re-developing the EID website to highlight successes and achievements in the network, provide a shop-window for infectious disease research in Edinburgh, and act as a directory of resources, facilities, people, and opportunities for members and stakeholders. We would also like impact evaluation of events and activities to become part of this role.

#### 5.4 Project Officer (FF), 1.0 FTE

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This role supports the ongoing Fleming Fund Fellowship Schemes in Uganda, Kenya and Malawi, being responsible for the organisation of training activities in Edinburgh and online, including visits to Edinburgh for Fellows, procurement of materials for collaborative projects, collating information for quarterly project and financial reports, and management of the communication channels for the Fellowship Scheme. The recent renewal of the Fleming Fund Fellowship Scheme (phase 2) and its expanded portfolio will fully occupy this role until the end of 2025. Beyond 2025, a further renewal of the Fleming Fund Fellowship Scheme (phase 3) is highly likely (hopefully with different management agents), for which this post will ensure crucial continuity. Furthermore, current bids that EID is supporting will require project officers in due course, which could be integrated into this role. This is particularly appropriate for bids and activities involving ECR support given the postholder's extensive experience with delivering fellowship training.

## 6. Value of EID to the UoE and vision

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Infectious diseases represent a global challenge disproportionately impacting the most vulnerable sectors of society and regions of the world; brought into sharp focus by the COVID-19 pandemic. UoE's 2030 strategy recognises a societal responsibility to contribute to these challenges. Our response must be inter-disciplinary and draw together all stakeholders, which is facilitated by the highly collaborative ethos of the EID membership. UoE has a track record in bold cross cutting initiatives and EID exemplifies UoE's inter- and trans-disciplinary world-class strengths in infectious disease-related science. This positions EID well to help its community compete for the increasing level of funds that the UKRI and Horizon Europe funds have ring fenced for infection research.

The research landscape of the EID membership is unique, spanning research that promotes human and animal health, combines data science with in-depth expertise, extends from bench to bedside, and effectively advocates for policy intervention. However, this community faces challenges, including being geographically dispersed across King's Buildings, Easter Bush, BioQuarter, Western campus and downtown, and needs a coherent voice to represent it, both inside and outside the UoE. By meeting these challenges, EID has grown from 135 principal investigators in 2012 to well over 200, and extended its scope and responsibilities.

We will continue to build EID's community to deliver in the areas detailed in the following sections. Furthermore, the ethos, strategic development, and delivery of EID, can be an exemplar for how other UoE groupings can galvanise to form an effective, outwards looking, and socially responsible academic community. In particular, EID is developing a model to foster different ways for Executive Committee members to contribute to EID. For example, ranging from 'just' strategic input at meetings to forming working groups to 'action' specific activities or long term goals.

EID also runs monthly meetings for these directors of other cross College networks (Edinburgh Neuroscience and One Health Genomics Edinburgh) to develop joint activities for our shared priorities and to share best practices avoid duplication.

## 6.1 Funding acquisition

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EID has won external funding for two Wellcome Trust 4-year PhD programmes (£11M), and Fleming Fund Fellowship Schemes (£1.2M). In addition, EID has made important contributions to development of funding applications for the NIHR Tackling Infection to Benefit Africa Global Health Unit (awarded £7.4M in 2017) and the Nexus for Global Health Research in Africa Research Group (unsuccessful application for £3M in 2021). Since the appointment of new directors in 2023, EID has supported four bids: (i) UKRI AMR network (£650K); (ii) UKRI epidemic preparedness (£100K); (iii) MRC CoRE Immunology (£26.5M); and phase 2 Fleming Fund Fellowship Scheme (£2.6M).

EID takes a flexible case-by-case approach to support for bids, which includes running sandpits and workshops to build teams and explore ideas, helping develop the scientific case and strategy, securing internal and external partners and their contributions, and detailing costings and drafting environment-related statements. EID will continue these activities with an emphasis on building topic-focused networks from which teams can emerge organically or can be identified to develop bids. Furthermore, by strengthening and building relationships with other Universities and stakeholder organisations, EID will facilitate multi-partner bids to UKRI and Horizon Europe. Such opportunities are expected to arise by working with, for example via Una Europa, SULSA (Scottish Universities Life Sciences Alliance), SPPIRIT (Scottish Parasitology Partnership for Research, Innovation, and Training). Work can also be conducted within UoE; better connecting College/School research managers with cross College networks could help sidestep the silo working that often constrains the quality of big bids.

While no further DTP opportunities are likely to surface from Wellcome, EID's track record means it is well placed to lead other DTP bids, for example, from UKRI or to work with ERO on Horizon Europe's MSCA Doctoral Network bids. Furthermore, Wellcome's emerging interest in funding career development resonates with EID's priorities, providing new opportunities for EID. Activities around career development will also enable EID to contribute to the UoE's Research Culture Delivery Plan.

For REF 2029, EID could also provide a rubric for multiple units of assessment to report on the elements "People Culture and Environment" which is assessed at Institute and at Unit levels (though the main gains will come from the Unit level). EID might also contribute to "Engagement" which goes beyond the single impact/case studies and does not need to be underpinned by a

publication. An economic impact study could be commissioned to value the contribution of EID to the UoE and its societal return on its investment (as recently undertaken for Roslin, as well as forecasting its future value.

## 6.2 Community activities

EID's activities contribute to UoE's R&I 2030 strategy for research, engagement, and environment. The flexibility, reach, and strong communication infrastructure within EID enables efficacy and promotes cohesion. This inter-connectivity is one of the strength's frequently remarked on favourably by funders and outsiders.

Community, cooperation, and collaboration are facilitated by EID's core activities that include weekly emails of announcements and information, a range of research seminars, themed symposia, annual meetings and named lectures. For example, in 2023 over 800 people registered to attend EID events. The impact of events are evaluated and the feedback received reflects the value placed by members on opportunities to come together to share knowledge and build connections, for example:

"Diverse, stimulating, enjoyable! I liked the variety of talks in terms of subject matter and length, and particularly enjoyed the short presentations in the afternoon" (attendee at the Annual Symposium).

"The small group discussions were a fantastic way to meet and network with people" (attendee at the OH symposium).

"Great speaker with an engaging and important topic" (attendee at the Winter Lecture).

EID will continue to deliver its core activities and support grass roots initiatives such as cross-cutting seminar series, novel symposia/workshops, and networking opportunities for its ECRs. Furthermore, EID is able to underwrite events which is key to attracting sponsorship that often fully covers event costs. An example budget for operational costs is given below (table 5).

Table 5: Example of EID core activities and costs (2024-25)

Winter lecture	2,100
Room hire	1,400
Hospitality	200
Travel /accommodation for speaker	500
Room hire & catering	10,000
Travel /accommodation for keynote	700
Symposium dinner	600
BBSRC call: coffee/snacks	2,000
Edinburgh MicroBiology forum seminar series	1,000

Edinburgh Virology group seminars series	1,000
Edinburgh AMR forum	200
Other EID events: workshops/sandpits	700
Contributions to grass roots / member led events	1,000
Support for ECR events/training/career development	3,000
Public Engagement activity (travel, equipment)	500
Staff running costs (travel)	200
Creative Suites inc ad hoc software requirements	1,000

While EID's core activities emerged from an initial survey of member needs and desires, EID will canvas the community to evaluate impact and determine how to prioritise existing and new activities. For example, the AMR Forum, led by Till Bachmann, is vibrant and active grouping and serves as a model for other groupings within EID to be developed. EID is well placed to integrate disciplines with seemingly obvious importance for infections (e.g. evolutionary biology, social sciences) into medical research and training. Work is needed to understand the communication and conceptual barriers to the uptake of these disciplines in medical and veterinary training and research, and to identify strategies to remove these barriers. Such activities could increase the impact of the DataLoch project.

### 6.3 ECR career development

Contributing to a positive research culture is a priority for EID and much can be achieved by embedding this into career development opportunities and a greater involvement of ECRs in shaping and delivering EIDs activities. For example, listening to the needs of ECRs and working for them to providing coaching on specific career goals, establishing mentoring programmes (both with senior researchers and with peers), providing networking and training opportunities, all create a supportive culture. Thus, EID will also increasingly involve ECRs in setting priorities for activities and their delivery, to both increase EID's value to ECRs and to provide opportunities to develop leadership skills.

Investing in ECRs is an effective mechanism to disseminate the UoE's values and share experience and practice in relation to science integrity and research culture across colleges. Supporting ECRs to become research leaders also supports innovation and interdisciplinary science, which underpin the research goals of the UoE 2030 R&I strategy. EID will facilitate such initiatives by involving ECRs in all Colleges and from strategic partners to join the Executive Committee. Furthermore, EID could support the new Chancellors Fellows in the "health" theme to build a cross-College cohort.

There is great potential to work with the UoE's postdoc societies, school level Directors of Career Development, and SPPIRIT (Scottish Parasitology Partnership for Research, Innovation, and Training) to deliver ECR-focussed activities. For example, most workshops focussed on competing for fellowships are very generic and try to cover all elements in a single session. Instead, applicants



at different stages if the process have different training needs so a tiered series of events has more impact. EID has access to PIs with a wealth of experience in winning, and in evaluating, funds from Wellcome and the MRC to help deliver these events and to help ERO tailor the Horizon Europe offerings it leads.

#### 6.4 Building a positive research culture

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EID will also work with its membership to help implement the Research Cultures Delivery Plan. For example, research culture surveys could evaluate the impact of initiatives (e.g. to promote open data and publishing, address bullying, research integrity, valuing DORA and the narrative CV, EDI, wellbeing and work-life balance). For challenges shared across academic fields, such initiatives could be trialled across Colleges by EID before wider implementation. By working together with Edinburgh Neuroscience, the networks can share best practice, bench mark across regions, and foster learning and development that benefits all.

EID also is well placed to take unique steps to promote equality, diversity and inclusivity beyond Edinburgh. For example, the Fleming Fellows have been undertaking a vast and diverse set of research activities in several different countries. Evaluation of whether their research procedures have been carried out in line with the UoE's values would demonstrate self-reflection. In the longer term, the transition of ECR's whose values are aligned with the Research Cultures Delivery Plan to PIs in the UoE will facilitate delivery of the Technicians Commitment and improve career development for long term research staff.

#### 6.5 Stakeholder engagement

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Our stakeholders include key educators, policy makers, and deliverers of human and animal health care. Work is needed to achieve external badging for the research strengths, facilities, training, experts, and opportunities available within EID. Such recognition is crucial to maintain the COVID-induced boost to collaboration in the clinical space, particularly with the NHS. Work with the Centre for Adapting to Environmental Change (ACE) could help EID diversify its policy impact. Recognition and opportunities will also flow from attracting membership and Executive Committee involvement from partners in Heriot Watt, Edinburgh Napier and Queen Margaret Universities and the SRUC where EID could have deeper reach. EID already has excellent links with strategic partners throughout Europe and Africa, and has the potential to reach into Australia and Latin America.

A re-vamped EID website could also collate the extensive and award-winning public engagement activities undertaken by EID members to achieve more effective advertising, as well as leveraging the economies of scale for developing and delivering activities. Analogous benefits apply to the deployment of and access to resources/facilities. We are also building a relationship with Edinburgh Neuroscience and One Health Genomics Edinburgh to share best practices for stake holder engagement and community cohesion. For example, Edinburgh Neuroscience has great success in access to and engagement with patient groups which EID could learn from, to connect researchers to people with lived experience of particular infectious diseases. EID is also working with ERO to

pilot workflows for curating funding data and with the EEI to develop a branch of “Earth Fellows” internships. Working together with other UoE networks and organisations offers a strong opportunity for networks to benchmark good practices that work across Colleges.

## Appendix A: EID’s activities during calendar year 2023

What	When	Why
EID directors meetings	every 2 weeks	EID organisation, logistics, delivery of activities, priority setting
UoE networks	monthly	Explore synergies and share best practice with Edinburgh Neuroscience and One Health Genomics Edinburgh
EC meetings	monthly	EID strategy, updates, task allocation and reporting
SULSA infectious diseases	quarterly	Represent EID membership for priority setting and lobbying
DTP Hosts, Pathogens and Global Health	January-February	Shortlisting, interviews, selection
DTP One Health Models of Disease	January-February	Shortlisting, interviews, selection
Oxford Nanopore Technologies visit	February	Showcase of Edinburgh ID research and use of sequencing technologies
One Health symposium	March (one day)	Explore breadth of topic throughout UoE, form links with Planetary Health
Konrad Adenauer Foundation	April (two days)	Present undergraduate STEM opportunities to delegation of university students from Germany
UKRI AMR network bid development	May-December	Workshops and engagement events
Symposium	June (one day)	Showcase membership's research, networking
DTP Hosts, Pathogens and Global Health retreat	June (two day)	Showcase PhD projects, networking and workshops
Fleming Fund phase 2 submitted	July	Renewal of scheme delivering capacity building
Ker PhD studentship launched	July/August	New PhD student for a genuinely collaborative project
UKRI Epidemic preparedness network bid development	September-December	Series of workshops to explore topics, team building, and strategy
DTP Hosts, Pathogens and Global Health	October	2023 cohort of students begin; recruitment for 2024 cohort
DTP One Health Models of Disease	October	2023 cohort of students begin, recruitment for 2024 cohort
MRC CoRE bid development	October	Team building, concept development and strategy
Winter lecture	November	High profile invited speaker for public lecture
UK Mission to EU, Brussels	November	Show case UoE One Health research, training, and capacity

UKRI AMR network bid submitted	December	
Fleming Fund phase 2 grant agreement	December	Renewal of scheme delivering capacity building
Science and Society Scotland: parliament review	December	Represent EID membership for priority setting and lobbying
ODA funds awarded	December	Bridging funds for staff key to delivering LMIC activities

## Appendix B: EID's structure

