

Amy Sweeny

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EDUCATION

UNIVERSITY OF EDINBURGH

PHD IN EVOLUTIONARY BIOLOGY

Sept 2019 | Edinburgh, UK

Supervisor: Amy B Pedersen

PRINCETON UNIVERSITY

AB IN ECOLOGY & EVOLUTIONARY BIOLOGY

June 2012 | Princeton, NJ, USA

Certificate, Global Health & Health Policy

Supervisor: Andrea L Graham

LINKS

Website: amysweeny.me

Google Scholar: [Amy R Sweeny](#)

Research Networks:

Wild Animal Microbiome Evolution

Animal Microbiome Research Group

The Viral Research Emergence Initiative

Soay sheep project: The ecology within

LEADERSHIP

- **Wild Animal Microbiome Evolution**
ESEB special topic network co-founder & organiser
- **Animal Microbiome Research Group**
Network co-founder & organiser
- **IEB Mental Health Support Group**
Co-founder & moderator
- **Parasite Special Interest Group**
British Ecological Society (BES), Events Representative
- **BES LGBTQ+ Peer Group** Mentor
- **PhD Student Representative**
University of Edinburgh

SERVICE

Ad-hoc peer reviewer for scientific journals including: *Functional Ecology*, *Journal of Animal Ecology*, *PeerJ*, *Proceedings B*, *Animal Conservation*, *Ecology Evolution*, *Parasitology Research*, *Evolution Medicine Public Health*, *Mammalian Biology*, *Global Change Biology*

SKILLS

R • Git/GitHub • Python • Statistics
Bioinformatics • Cluster Computing
Data Visualisation • Reproducibility
Data Synthesis

BIO

I AM A DATA-MINDED ECOLOGIST INTERESTED IN WITHIN-HOST COMMUNITIES OF MICROORGANISMS & THEIR IMPACTS ON HEALTH. I USE A COMBINATION OF EMPIRICAL & DATA SCIENCE TO ADDRESS POPULATION AND CROSS-SYSTEM QUESTIONS TO IMPROVE PREDICTIVE MODELLING.

EXPERIENCE

POSTDOC | DEMOGRAPHY & POPULATION BIOLOGY

Since May 2022 | University of Sheffield

- Exploring the role of individual microbiome variation for host population dynamics

POSTDOC | WITHIN-HOST ECOLOGY

Sep 2019 - Apr 2022 | University of Edinburgh

- Investigated drivers & dynamics of within-host commensal & parasite communities in the wild

RESEARCH COLLABORATOR | VIRAL EMERGENCE

Since Sep 2020 | VERENA, Georgetown University

- Exploring impacts of co-infection on wildlife health & disease emergence

PHD | DISEASE ECOLOGY

Sep 2015 - Sep 2019 | University of Edinburgh

- Explored the ecology of host-parasite dynamics in wild wood mice through field & lab experiments & large-scale analysis of historical datasets

POSTBAC FELLOW | MOLECULAR ECOLOGY

July 2013 - Aug 2015 | National Institutes of Health (NIH)

- Investigated impacts of climate change on parasite transmission & disease emergence in marine mammals

PRINCETON PROJECT 55 FELLOW | PROJECT MANAGEMENT

July 2012 - Aug 2013 | Aeras TB Vaccine Development

- Implemented integrated timeline tracking systems across all departments & completed ad-hoc analyses for global health department

AWARDS & FUNDING

2022	\$12,456,537	VERENA: NSF Biology Integration Institute Implementation 'Predicting the global host-virus network from molecular foundations' Role: Senior Personnel, Investigator (60 months, 16% time)
2022	\$1,200	Changing Microbiomes Travel Award, Penn State USA
2021	€20,000	ESEB Special Topic Network Funds, co-organiser
2019	EEID Poster	Princeton University Press Book Prize
2019	\$1,000	IDEAS Workshop Attendance, Princeton USA
2019	£150	IDEAS Workshop Attendance, Glasgow UK
2018	3 Minute Thesis	Uni of Edinburgh School & College Level Winner
2016	£1992	Moray Endowment, 'Deciphering the complex interactions within the mammalian gut', co-I
2015	£60,500	The Darwin Trust of Edinburgh PhD fellowship
2014	\$30,000	NIH Intramural training award
2013	\$30,000	NIH Intramural training award
2012	\$33,000	Princeton Project 55 civic service fellowship

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MEETING ORGANISATION

- Aug 2022 - **ESEB Congress, Prague CZ**, Symposium organiser: 'Microbiomes in the wild'
- Nov 2021 - **Animal Microbiome Research Group ECR Seminar, Virtual**, Co-organiser
- Dec 2020 - **British Ecological Society Annual Meeting, Virtual**, Thematic session organiser: 'Wild Microbiomes'
- Nov 2020 - **Animal Microbiome Research Group ECR Seminar, Virtual**, Co-organiser

PUBLICATIONS

See [Google Scholar](#) for full details

§ CO-LEAD FIRST AUTHORSHIP

- 20 Hayward AD, Behnke JM, Childs DZ, Corripio-Miyar Y, Fenton A, Fraser MD, Kenyon F, McNeilly TN, Pakeman RJ, Pedersen AB, Pemberton JM, **Sweeny AR**, Wilson K, Pilkington JG (2022). Long-term temporal trends in gastrointestinal parasite infection in wild Soay sheep. *Parasitology*.
<https://doi.org/10.1017/S0031182022001263>
- 19 Wu VY, Chen B, Christofferson R, Ebel G, Fagre AC, Gallichotte EN, **Sweeny AR**, Carlson, CJ, Ryan SJ (2022). A minimum data standard for vector competence experiments. *Sci Data*.
<https://doi.org/10.1038/s41597-022-01741-4>
- 18 **Sweeny, AR**§ & Albery, GF§ (2022). Exposure & susceptibility: the twin pillars of infection, *Functional Ecology*.
<https://doi.org/10.1111/1365-2435.14065>
- 17 Albery GF, Carlson CJ, Cohen LE, Eskew EA, Gibb R, Ryan SJ, **Sweeny AR**, Becker DJ (2022). Urban-adapted mammal species have more known pathogens. *Nat Ecol Evol.* <https://doi.org/10.1038/s41559-022-01723-0>
- 16 **Sweeny AR**, Corripio-Miyar Y, Bal X, Hayward AH, Pilkington JG, Nussey DH, McNeilly TM, Kenyon, F (2022) Longitudinal dynamics of co-infecting gastrointestinal parasites in a wild sheep population. *Parasitology*.
<https://doi.org/10.1017/S0031182021001980>
- 15 Corripio-Miyar Y, Hayward A, Lemon H, **Sweeny AR**, Bal X, Kenyon F, Pilkington JG, Pemberton JM, Nussey DH, McNeilly TN. Functionally distinct T-helper cell phenotypes predict resistance to different types of parasites in a wild mammal. *Scientific Reports*, <https://doi.org/10.1038/s41598-022-07149-9>
- 14 **Sweeny AR**, Albery GF, Becker DJ, Eskew EA, Carlson CJ (2021). Synzootics. *Journal of Animal Ecology*.
<https://doi.org/10.1111/1365-2656.13595>
- 13 Petrullo L§, Baniel A§, **Sweeny AR**§ (2021). Establishing a virtual network in mammalian microbiome research. *Evolutionary Anthropology*. <https://doi.org/10.1002/evan.21889>
- 12 Albery GF, **Sweeny AR**, Becker DJ, Bansal S (2021). Fine-scale spatial patterns of wildlife disease are common and understudied. *Functional Ecology*, <https://doi.org/10.1111/1365-2435.13942>
- 11 **Sweeny AR**, Albery GF, Venkatesan S, Fenton A, Pedersen AB (2021). Spatiotemporal variation in drivers of parasitism in a wild wood mouse population. *Functional Ecology*. <https://doi.org/10.1111/1365-2435.13786>
- 10 **Sweeny AR**, Clerc M, Pontifes P, Venkatesan S, Babayan SA, Pedersen AB (2021). Supplemented nutrition decreases helminth burden and increases drug efficacy in a natural host–helminth system. *Proceedings B*.
<https://doi.org/10.1098/rspb.2020.2722>
- 9 Gibb R, Albery GF, Becker DJ, Brierley L, Connor R, Dallas TA, Eskew EA, Farrell MJ, Rasmussen AL, Ryan SJ, **Sweeny AR**, Carlson CJ, Poisot T (2021). Data proliferation, reconciliation, and synthesis in viral ecology. *Bioscience*. <https://doi.org/10.1093/biosci/biab080>
- 8 **Sweeny AR**§, Thomason CA§, Carbajal, EA, Hansen, CB, Graham, AL, Pedersen, AB (2020). Experimental parasite community perturbation reveals associations between Sin Nombre virus and gastrointestinal nematodes in a rodent reservoir host, *Biology Letters*. <https://doi.org/10.1098/rsbl.2020.0604>

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- 7 Greischar MA, Alexander HK, Bashey F, Bento, AI, Bhattacharya A., Bushman M, Childs LM, Daversa DR, Day T, Faust CL, Gallagher ME, Gandon S, Glidden CK, Halliday FW, Hanley KA, Kamiya T, Read AF, Schwabl P, **Sweeny AR**, Tate AT, Thompson RN, Wale N, Wearing HJ, Yeh PJ, Mideo N (2020). Evolutionary consequences of feedbacks between within-host competition and disease control, *Evolution, Medicine, and Public Health*. <https://doi.org/10.1093/emph/eoaa004>
- 6 Verma SK, **Sweeny AR**, Lovallo MJ, Calero-Bernal R, Kwok OC, Jiang T, Su C, Grigg ME, Dubey JP (2017). Seroprevalence, isolation and co-infection of multiple *Toxoplasma gondii* strains in individual bobcats (*Lynx rufus*) from Mississippi, USA *International Journal for Parasitology*. 10.1016/j.ijpara.2016.12.007
- 5 Barbieri MM, Kashinsky L, Rotstein DS, Colegrave KM, Haman KH, Magargal SL, **Sweeny AR**, Kaufman AC, Grigg ME, Littnan CL (2016). Protozoal-related mortalities in endangered Hawaiian monk seals *Neomonachus schauinslandi*. *Diseases of Aquatic Organisms*. 10.3354/dao03047
- 4 Wilson DJ, Orsel K, Waddington J, Rajeev M, **Sweeny, AR**, Joseph T, Grigg ME, Raverty SA (2016). *Neospora caninum* is the leading cause of bovine fetal loss in British Columbia, Canada. *Veterinary Parasitology*. 10.1016/j.vetpar.2016.01.006
- 3 Barbosa L, Johnson CK, Lambourn DM, Gibson AK, Haman KH, Huggins JL, **Sweeny AR**, Sundar N, Raverty SA, Grigg ME (2015). A novel *Sarcocystis* *neurona* Genotype XIII is associated with severe encephalitis in an unexpectedly broad range of marine mammals from the Northeastern Pacific Ocean. *International Journal for Parasitology*. 10.1016/j.ijpara.2015.02.013
- 2 Verma SK, Calero-Bernal R, Lovallo MJ, **Sweeny AR**, Grigg ME, Dubey JP (2015). Detection of *Sarcocystis* spp. infection in bobcats (*Lynx rufus*). *Veterinary Parasitology*.
- 1 Verma SK, Calero-Bernal R, Lovallo MJ, **Sweeny AR**, Grigg ME, Dubey JP (2015). Bobcat (*Lynx rufus*) as a new natural intermediate host for *Sarcocystis* *neurona*. *Veterinary Parasitology*.

PREPRINTS & IN PREP

- 3 Gupte PR, Albery GF, Gismann J, **Sweeny AR**, Weissing FJ (2022). Novel pathogen introduction rapidly alters evolved movement strategies, restructuring animal societies. *bioRxiv*. doi: <https://doi.org/10.1101/2022.03.09.483239>
- 2 Chen B, **Sweeny AR**, Wu VF, Christofferson R, Ebel G, Fagre AC, Gallichotte E, Kading R, Ryan SJ, Carlson CJ (2022). Exploring the mosquito-arbovirus network: a survey of vector competence experiments. *bioRxiv*. <https://doi.org/10.1101/2022.05.19.492743>
- 1 **Sweeny AR**§ Lemon H§, Ibrahim A, Nussey DH, Free A, McNally L (2020). A mixed model approach for estimating drivers of microbiota community composition and differential taxonomic abundance. In revision. *bioRxiv* <https://doi.org/10.1101/2020.11.24.395715>

RESEARCH GRANTS

Active

NSF Biology Integration Institute Implementation, \$12,456,537

'Predicting the global host-virus network from molecular foundations' Role: Senior Personnel, Investigator (60 months, 16% time)

In review

NERC Pushing the frontiers of environmental science, £798,990

'When does a supershedder become a superspreader?: The impact of individual-level heterogeneities on population-level transmission and spread' Role: Co-investigator (36 months)

CONSORTIUM GRANTS

ESEB Special Topic Network, €20,000

'WAME - Wild Animal Microbiome Evolution' Role: Co-founder & organiser (24 months)

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INVITED SEMINARS

- Oct 2022, **Moredun Research Institute**, Penicuik UK: "Within-host gut community dynamics of wild mammals"
- Feb 2021, **Colorado State University DMIP Seminar**, Virtual: "The Ecology Within: Within-host microorganism communities & their impact on disease in the wild" (\$200 Honorarium)
- Nov 2020 **Berkeley EEID Seminar, Virtual**: "The Ecology Within: Within-host microorganism communities & their impact on disease in the wild"
- Nov 2019 **Georgetown University Bansal Lab Seminar**, Georgetown, USA: 'Drivers of host-parasite interactions across ecological scales
- Apr 2019 **Out Thinkers**, Edinburgh, UK: 'Host-parasite dynamics in an ecologically variable world'
- May 2015 **Laboratory of Parasitic Diseases Seminar**, National Institutes of Health, Bethesda, MD, USA: 'Protozoal population shifts at the Arctic/ Subarctic interface'

SELECTED TALKS & POSTERS

Contributed 11 conference talks & 7 research posters to meetings since 2015

- 2022 **4th International Congress on Parasites of Wildlife**, Kruger National Park SA. Contributed talk: 'Longitudinal dynamics of co-infecting gastrointestinal parasites in a wild sheep population'
- 2022 **Changing Microbiomes**, Penn State USA. Travel award talk: 'Empirical Dynamic Modelling Reveals Chaos and Causality in the Microbiome'
- 2021 **BES Annual Meeting**, Liverpool UK. Contributed talk: 'Empirical Dynamic Modelling Reveals Chaos and Causality in the Microbiome'
- 2021 **WAAVP Annual Meeting**, Virtual "The gastrointestinal nematode of a wild ungulate: Age, sex, and season determinants of nematode community composition'
- 2020 **BES Annual Meeting**, *Invited speaker*: 'A mixed model approach for estimating drivers of microbiota community composition and differential taxonomic abundance'
- 2020 **Mammalian Microbiome ECR Seminar**, Virtual, Contributed talk: 'A GLMM approach for estimating drivers of microbiota community composition and differential abundance'
- 2019 **LGBTSteminar**, London, UK: 'Nutrition supplementation drives parasite community dynamics in wild wood mice'
- 2018 **EEID Annual Meeting**, Glasgow, UK: 'Nutrition supplementation drives parasite community dynamics in wild wood mice'
- 2018 **Edinburgh Infectious Disease Annual Symposium**, Edinburgh, UK. *Invited Speaker*: 'Improved nutrition increases resistance to helminths and anthelmintic efficacy in wild and laboratory mice'
- 2017 **Jacque Monod Conferences: Open Questions in Disease Ecology**, Roscoff, France: Poster, 'Resource supplementation drives parasite community dynamics in a wild wood mouse population'
- 2017 **3rd International Conference on Parasites of Wildlife**, Kruger National Park, SA. *Invited speaker*: 'The effects of nutrition on parasite community dynamics in a wild wood mouse population'

TEACHING & OUTREACH

- June 2020 **Glasgow University IBAHMC Pride Event**, *Invited Speaker*. 'Harnessing the complexity of wild populations: what can diversity teach us about disease?'
- Feb 2018 **British Ecological Society Undergraduate Career Day**, *Invited Speaker*. 'Postgraduate Research Options and Paths to a PhD'
- July 2018 **British Ecological Society Summer School**, *PhD mentor*. Provided career mentoring, designed and ran parasite ecology and statistical course activities, and assisted in running undergraduate fieldwork courses
- 2015-2019 **University of Edinburgh**, *Demonstrator*. Practical assistance and marking for 1st-3rd year courses: Animal Biology, Parasite Biology, and Biology, Ecology and The Environment
- 2015-2018 **Educate Edinburgh**, *Biology Tutor Secretary*. Volunteer tutor for biology review and higher test prep for local school students

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SUPERVISION

2022

- Rowan Bancroft, PhD Wellcome Trust Hosts, Pathogens Global Health (Thesis committee & project co-supervisor)
- Keir Hardy: Honours student, Zoology, University of Edinburgh (Project supervisor)

2021

- Ellis Wiersma: Honours student, Zoology, University of Edinburgh (Project supervisor)
- Fiona Sykes: Honours student, Zoology, University of Edinburgh (Project co-supervisor)

2020

- Agnes Dove: Honour student, Ecology, University of Edinburgh (Project supervisor)
- Peter Fuller: Honours student, Ecology, University of Edinburgh (Project co-supervisor)
- Madryn Riewer: Honours student, Zoology, University of Edinburgh (Project co-supervisor)

2019

- Rowan Bancroft: MsC Hosts, Pathogens Global Health, U of Edinburgh (Project co-supervisor)
- Shin Li: MsC Infectious Disease, University of Edinburgh (Project co-supervisor)

2018

- Rosie Mackenzie: Honours student, Zoology, University of Edinburgh (Project co-supervisor)
- Georgie Everest: Honours student, Immunology, University of Edinburgh (Project co-supervisor)
- Alannah Pollock: Honours student, Zoology, University of Glasgow (Fieldwork supervisor)

2017

- Sophie Stenson, Summer student, University of Edinburgh (Project supervisor)
- Madison MacLeay: Honours student, Zoology, University of Edinburgh (Project co-supervisor)
- Siyan Zhu: Honours student, Immunology, University of Edinburgh (Project co-supervisor)
- Alexandra Morris: MsC Infectious Disease, University of Edinburgh (Lab supervisor)

2016

- Christoforos Rozario: Summer student, University of Edinburgh (Project supervisor)