KATARINA STUART
Curriculum vitae

School of Biological Sciences
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Google Scholar | Website | GitHub

Research Interests

My interests are in evolutionary genomics and exploring the proximate mechanisms that facilitate local adaptation. Most of my research is conducted on introduced species, as successful invasives provide an important opportunity to observe rapid evolution within a species as it responds to a new ecosystem. Understanding rapid adaptation within invasive populations has applications in many scientific fields, including but not limited to pest control, conservation, organism response to climate change, and evolutionary mechanisms. Many of my projects focus on the invasive starling population in Australia and identifying adaptive genetic shifts post invasion.

My projects and interests cover a range of fields, including genomics, bioinformatics, ecological statistics, and field ecology

Education

DOCTOR OF PHILOSOPHY (BIOLOGY) 2018-2022
University of New South Wales
Thesis Title: A genetic perspective on rapid adaptation in the globally invasive European starling (*Sturnus vulgaris*)
Supervisors: Lee A Rollins, Richard J Edwards, & William B Sherwin

BACHELOR OF SCIENCE (ADVANCED) (HONOURS) 2013-2017
University of Sydney
Thesis Title: Mechanisms generating geographic divergence in phenotypic traits within the invasive cane toad in Australia
Supervisors: Richard Shine & Gregory Brown

Professional Appointments

Research Fellow May 2022 - Present
University of Auckland

Research Assistant 2020-2022
University of New South Wales

Research Assistant August 2017
Deakin University

Grants, Scholarships, & Awards

SCHOLARSHIPS & RESEARCH GRANTS

2022	GSA Workshop Support Program	1,000 AUD
2022	AES ECR Networking Grant	2,000 AUD
2022	UNSW Science PhD Writing Scholarship	7,500 AUD
2019;2020	Holsworth Wildlife Research Endowment	6,375;7,500 AUD
2018-2022	Australian Government Research Training Program Scholarship	≈27,000 AUD PA

AWARDS

2022	Dean's Award for Outstanding PhD Theses	-

2022	SMBE Invasomics Conference Oral Presentation Award	250 NZD
2021	GSA 2021 Mayo Prize for best student presentation	-
2021	Outstanding E&ERC Postgraduate Researcher	-
2020	Australasian Evolution society student talk award (2nd Place)	200 AUD
2019	The Outstanding Evolution and Ecology Presentation EERC talk	200 AUD
2018	COMBINE 2018 Symposium 3rd place best oral presentation	50 AUD
2018	The Outstanding Evolution and Ecology Presentation EERC (2nd place)	-

TRAVEL GRANTS

2023	Genomics Aotearoa – He taonga tuku iho scholarship	600 NZD
2023	Queenstown Research Week's Genomics satellite scholarship	1180 NZD
2022	School of Biological Science support scheme	1,500 NZD
2022	SMBE Invasomics Conference	400 NZD
2022	University of Auckland FoS Research Fellow Society	500 NZD
2021	Postgraduate Research Student Support (PRSS) Scheme	1,000 AUD
2020	Genetic Society of Australia Smith-White Travel award	-
2018	ABACBS National Conference CSL travel award	200 AUD

PUBLICATIONS

PREPRINT & UNDER REVIEW/REVISION

15. Stuart KC, Atsawawaranunt K, Johnson R, Major R, Ewart KM, Rollins LA, Santure AW, Whibley A (2023) The genome of a globally invasive passerine, the common myna (*Acridotheres tristis*), in prep.

14. Ahrens C, Chen S, Bothwell H, Stuart KC, Edwards RJ, Bragg J (2022) A genome-wide view of adaptation across the landscape. *Genetics*, under Review.

13. Zhou J, Nelson TM, Lopez CR, Zhou SJ, Ward-Fear G, Stuart KC, Rollins LA (2021) Microbial function is related to behavior of an invasive anuran. *BioRXIV*, https://doi.org/10.1101/2020.11.16.385690

PEER REVIEWED ARTICLES

-2023-

12. Hofmeister NR, Stuart KC, Warren WC, Werner SJ, Bateson M, Ball GF, Buchanan KL, Burt DW, Cardilini APA, Cassey P, De Meyer T, George J, Meddle SL, Rowland HM, Sherman CDH, Sherwin WB, Berghe WV, Rollins LA, Clayton DF (2021). Concurrent invasions by European starlings (Sturnus vulgaris) suggest selection on shared genomic regions even after genetic bottlenecks. *Molecular Ecology*, Accepted. *BioRXIV* at *https://doi.org/10.1101/2021.05.19.442026*

11. Miller SM, Stuart KS, Burke NW, Rollins LA, Bonduriansky R (2022) Genetic and phenotypic consequences of local transitions between sexual and parthenogenetic reproduction in the wild. *American Naturalist*, Accepted. *BioRXIV* at https://doi.org/10.1101/2022.11.02.514965

10. Li-Williams S†, Stuart KC†, Comte S, Forsyth DM, Dawson M, Sherwin WB, Rollins LA. (2023) Genetic analysis reveals spatial structure in an expanding introduced rusa deer population, *Wildlife Research*, WR22128. († indicates joint first authorship)

9. Stuart KC, Edwards, RJ, Sherwin WB, Rollins, LA. (2023) Contrasting patterns of single nucleotide polymorphisms and structural variations across multiple invasions. *Molecular Biology and Evolution*, 40(3): msad046. https://doi.org/10.1093/molbev/msad046

8. Stuart KC†, Hofmeister NR†, Zichello JM, Rollins LA. (2023) Global invasion history and native decline of the common starling: insights through genetics, *Biological Invasions*. https://doi.org/10.1007/s10530-022-02982-5 († joint first author)

7. Stuart KC, Sherwin WB, Edwards RJ*, Rollins LA* (2023) Evolutionary genomics: Insights from the invasive European starlings, *Frontiers in Genetics* (* indicates joint last authorship). https://doi.org/10.3389/fgene.2022.1010456

-2022-

6. Stuart KC†, Edwards RJ†, Cheng Y, Warren WC, Burt DW, Sherwin WB, Hofmeister NR, Werner SJ, Ball GF, Bateson M, Brandley MC, Buchanan KL, Cassey P, Clayton DF, De Meyer T, Meddle SL, Rollins LA (2021). Transcript- and annotation-guided genome assembly of the European starling. *Molecular Ecology Resources*, https://doi.org/10.1101/2021.04.07.438753 † joint first author

5. Stuart KC, Sherwin WB, Cardilini APA, Rollins LA (2022). Genetics and plasticity are responsible for climate induced ecogeographical patterns in a recent invasion. *Frontiers in Genetics* DOI: https://doi.org/10.3389/fgene.2022.824424.

4. Stuart KC, Sherwin WB, Austin JJ, Bateson M, Eens M, Brandley MC, Rollins LA (2022). Historical museum samples enable the examination of divergent and parallel evolution during invasion. *Molecular Ecology*, 31(6):1836-1852, https://doi.org/10.1111/mec.16353.

-2021-

3. Stuart KC†, Cardilini APA†, Cassey P, Richardson MF, Sherwin W, Rollins LA*, Sherman CDH*. (2021) Signatures of selection in a recent invasion reveal adaptive divergence in a highly vagile invasive species. *Molecular Ecology*, 30(6):1419-1434, https://doi.org/10.1111/mec.15601 († indicates joint first authorship, * indicates joint last authorship)
   Featured in *Molecular Ecology* News and Views: https://doi.org/10.1111/mec.15794

-2019-

2. Stuart KC, Brown GP, Shine R. (2019) Proximate mechanisms underlying the rapid modification of phenotypic traits in cane toads (*Rhinella marina*) across their invasive range within Australia. *Biol J Linnean Soc*. 126(1):68-79, https://doi.org/10.1093/biolinnean/bly150

-2018-

1. Hudson CM, Brown GP, Stuart KC, Shine R. (2018) Sexual and geographical divergence in head widths of invasive cane toads, *Rhinella marina* (Anura: Bufonidae), is driven by both rapid evolution and plasticity. *Biol J Linnean Soc*. 124(2):188-99, https://doi.org/10.1093/biolinnean/bly040

PEER REVIEWED BOOK CHATPERS

1. Stuart KC, Woolnough AP, Rollins LA. (2023) Invasive species detection and management using genomic methods. in Holleley, C.E., Berry, O. and Jarman, S. Applied Ecological Genetics. CSIRO Publishing, Canberra

Teaching Experience

2018-2022 **BABS3291 – Genes, Genomes and Evolution** *UNSW Sydney, AUS*
Laboratory demonstrator for a third-year biotechnology and biomolecular sciences subject, teaching students with a range of biological and coding knowledge. Key topics include introduction to evolutionary bioinformatics, fundamental genomic principles, and investigation into recent advancements in the field.

2021 **BIOC2201 – Principles of molecular biology** *UNSW Sydney, AUS*
Laboratory demonstrator and tutor for a second-year biochemistry subject, with key topics including an introduction to modern molecular biology, molecular mechanisms of gene expression, and fundamental aspects of recombinant DNA technology

2019- **BABS2204 – Genetics** *UNSW Sydney, AUS*

2021 Laboratory demonstrator for a second-year biotechnology and biomolecular sciences subject. Duties include supervising classes to ensure safely protocols are adhered to, marking assignments, and supervising assessable tasks. I was responsible for motivating constructive discussion among students, as well as explaining biological processed to students, and assisting with experimental procedures.

2021 **BIOC2101 - Principles of Biochemistry** *UNSW Sydney, AUS*
Laboratory demonstrator for a second-year biochemistry subject, with key topics including and introduction to modern biochemistry, and covers fundamental aspects of the structure-function relationships of proteins and an overall coverage of intermediary metabolism.

2020 **Science and Engineering Indigenous Preparatory Program** *UNSW Sydney, AUS*
Project Developer and Instructor for the Science and Engineering Indigenous Preparatory Program. Prepared and delivered 3 hours of first year university level biology teaching content for incoming and prospective first year university students.

2019 **ANGUS 2019 - Data Intensive Biology Summer Institute** *UC Davis, USA*
Teaching assistant at the ANGUS summer course held through the Data Intensive Biology Summer Institute and the Lab for Data Intensive Biology at UC Davis. Taught learners from varied backgrounds (undergraduate to professorial) genomic practices for analysing big shotgun sequencing data sets over the intensive two-week course, as well as working one on one with learners on their own data sets.

Supervision Experience

2021-2022 **Masters student supervision**
Project involved reduced representation sequencing of invasive deer in conjunction with the NSW Department of Primary Industries.

2019 **NSW Year 12 Extension Science Project Supervisor**
Primary supervisor for final high school year student on an extension science project. Work covered developing coding, analytical, writing, and general scientific skills to help them produce a report in fulfillment of their course outcomes. Assisted student in preparing a conference presentation, which they gave at the 2019 Australasian Evolution Conference.

Scientific Presentations

INVITED TALKS

2023 **Zoology Seminar – Otago University |** Invasive species, and the secrets they can teach us about the genetics of local adaptation. *Virtual*

2023 **Sydney Bioinformatics Seminar Series – University of Sydney |** A genetic perspective on rapid adaptation in the globally invasive European starling (Sturnus vulgaris) *Virtual*

2021 **Queensland Technologies and Innovations group seminar talk – University of Queensland |** The draft genome assembly of the globally invasive common starling, Sturnus vulgaris *Virtual*

2020 **Genetics Society of AustralAsia Award Symposium |** Whole transcripts in genome assembly, annotation, and assessment: the draft genome assembly of the globally invasive common starling, Sturnus vulgaris *Virtual*

TALKS

2023 **International Congress of Genetics |** A whole genome perspective on genetic variation and rapid adaptation. *Melbourne, AUS*

2022	**Australasian Evolution Society National Conference** | Genetics and plasticity are responsible for ecogeographical patterns in a recent invasion.	*ANU, AUS*
2022	**NZ Molecular Ecology Conference** | Contrasting patterns of single nucleotide polymorphisms and structural variations across multiple invasions.	*Auckland, NZ*
2022	**SMBE Invasomics Conference** | Contrasting patterns of single nucleotide polymorphisms and structural variations across multiple invasions.	*UoW, NZ*
2022	**ComBio/Genetics Society of Australasia** | Genetics and plasticity are responsible for ecogeographical patterns in a recent invasion.	*UoM, AUS*
2021	**Australasian Evolution Society Conference** | A genetic perspective on rapid adaptation in the globally invasive European starling (Sturnus vulgaris).	*Virtual*
2021	**Genetics Society of AustralAsia Conference** | A genetic perspective on rapid adaptation in the globally invasive European starling (Sturnus vulgaris).	*Virtual*
2020	**Australasian Evolution Society Conference** | Rapid Adaptation in invasive species: Using historical museum samples to examine evolution in an invasive passerine.	*Virtual*
2020	**Postgraduate Research Forum** | Investigating evolution using invasive species and historical museum samples.	*Virtual*
2020	**ABACBS Virtual Conference** | Whole transcripts in genome assembly, annotation, and assessment: the draft genome assembly of the globally invasive common starling, Sturnus vulgaris.	*Virtual*
2019	**Postgraduate Research Form** | Evolution in invasive species: exploring adaptive divergence and selection across the Australian landscape.	*UNSW, AUS*
2019	**Australasian Evolution Society National Conference** | Local signatures of founding populations confound identification of adaptive divergence in invasive populations.	*UNSW, AUS*
2018	**COMBINE Symposium** | Evolution in invasive populations: using genomics to reveal drivers of invasion success in the Australian European starling (Sturnus vulgaris) introduction across Australia.	*UM, AUS*
2018	**Postgraduate Research Form, University of New South Wales** | Evolution in invasive populations: using genomics to reveal drivers of invasion success in the Australian European starling (Sturnus vulgaris) introduction across space and time.	*UNSW, AUS*

POSTERS

2022	**Lorne Genome Conference** | A genetic perspective on rapid adaptation in the globally invasive European starling (Sturnus vulgaris).	*Lorne, AUS*
2019	**GIW/ABACBS International Conference** | Using genomics to reveal drivers of invasion success.	*USYD, AUS*
2019	**COMBINE/AYRCOB Symposium** | Using genomics to reveal drivers of invasion success.	*USYD, AUS*
2018	**ABACBS National Conference** | Evolution in invasive populations: using genomics to reveal drivers of invasion success in the Australian European starling (Sturnus vulgaris) introduction across Australia.	*UM, AUS*

SERVICE, OUTREACH & MEDIA

SERVICE

2023 **Centre for Computational Evolution -** *seminar series organiser*

2023 **International Congress of Genetics conference 2023** - *Symposia Organiser and Chair*

2021 **GSA 2021 Virtual Conference Committee** – *Committee Member*
Assisted with the organisation of the 2021 Genetics Society of AustralAsia Virtual Conference.

2018-2020 **Sydney Society for Conservation Biology** – *President*, *Communications*
Responsible for managing the society board committee, overseeing finances and event organisation and execution. Additionally, responsible for maintaining the social media pages (Facebook and Twitter), and organised and wrote a monthly newsletter for society members.

2019 **COMBINE General Committee -** *Symposium Coordinator*
I was responsible for assembling the 2019 COMBINE symposium committee, supervising the organisation of all aspects of the event. Key roles include meeting outcome deadlines, ensuring budget restraints were met and invoiced, and assisting to organise the assembly of a guest careers panels.

2019-2020 **E&ERC Postgraduate Committee** – *Committee Member*
My job was to provide a lively, inclusive, fun and academically enriching experience for all postgraduates in the E&ERC. I organise formal and informal centre gatherings, two seminar speakers, encourage student participation in centre activities and help integrate new students.

2019 **GIW/ABACBS 2019 Conference Committee** – *COMBINE representative*
Liaised between the ABACBS conference committee and COMBINE symposium committee to ensure budget and time restraints were met.

2019 **AES 2019 Conference Committee**– *Committee Member*
Assisted with the organisation of the 2019 Australasian Evolution Society Conference.

OUTREACH & MEDIA

2020, 2022 **Boiling Point Science Podcast** – *Guest*
Guest on EastSide 89.7 FM science podcast Boiling Point (August 2020, May 2022)

2014-2019 **Australian National Museum -** *Volunteer*
Assisting with running events and demonstration, chaperoning school groups, and general communications and operational duties during Australian Science Week.

2016 **Friends of Fogg Dam -** *Invited Speaker*
Gave a talk to a community ecology and restoration group on the developing aspects of my honours research.

PROFESSIONAL DEVELOPMENT & TRAINING

2022 **Carpentries Instructor Training and Certification** *University of Auckland, NZ*

2020 **UNSW Women in Maths and Science Champions Program** *UNSW Sydney, AUS*

2020 **Sessional Staff Development Program** *UNSW Sydney, AUS*

2018 **Bioconductor Hands-on Training Day** *University of Melbourne, AUS*
4th Bioconductor Asia meeting

2018 **Sample Size and Power Calculations** *UNSW Sydney, AUS*

Stats Central

2018 **ANGUS – Analysing Sequencing Data** *UC Davis, USA*
Data Intensive Biology Summer Institute

2018 **Software Carpentry Workshop – R, Unix shell, Git** *Curtin University, AUS*

Professional Membership

2022- **Society for Molecular Biology and Evolution** (SMBE)

2020- **Genetics Society of AustralAsia** (GSA)

2019- **AustralAsian Evolution Society** (AES)

2018-2021 **Australian Bioinformatics and Computational Biology Society** (ABACBS)

2018-2021 **Ecological Society of Australia** (ESA)

References

Associate Professor Lee Ann Rollins | Scientia Fellow l.rollins@unsw.edu.au
School of Biological, Earth and Environmental Sciences, University of New South Wales, Sydney NSW 2052 +61 9385 6316
Professor Richard Shine | Professor rick.shine@mq.edu.au
School of Natural Sciences, Macquarie University, North Ryde NSW 2109

Dr Gregory Brown | Post-Doc greg.brown@mq.edu.au
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