

## Esra DURMAZ MITCHELL, PhD

**PhD in life sciences with hands-on experience in NGS, including WGS, Pool-seq, RNA-seq, and ATAC-seq. Experienced in genomic data analysis and interpretation in variant and rare disease contexts, combining sequencing-based experiments with bioinformatic approaches.**

University of Southern Denmark, Department of Biochemistry and Molecular Biology

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### **PERSONAL INFORMATION**

Date/Place of birth	01 July 1986, Ankara, Turkey
Citizenship	Republic of Türkiye
Languages	Turkish (native), English (fluent), Danish (intermediate), French (basic)
Programming Languages	R, Python, Bash

### **EDUCATION**

2013 – 2017	<b>Ph.D.</b> in Life Sciences, University of Lausanne, Department of Ecology and Evolution, Lausanne, CH <i>Effects of Clinal Polymorphisms on Drosophila Life History</i> Advisors: Prof. Thomas Flatt & Prof. Tadeusz Kawecki
2009-2012	<b>M.Sc.</b> in Biology, Hacettepe University, Department of Biology, Ankara, TR <i>A study of sexual maturity, offspring number and mating behavior characteristics in genetically different natural isofemale lines of Drosophila subobscura from Turkey</i> Advisors: Ass. Prof. Ergi Deniz Özsoy & Prof. Therese Ann Markow
2004-2009	<b>B.Sc.</b> in Biology, Hacettepe University, Department of Biology, Ankara, TR

### **KEY SKILLS AND COMPETENCIES**

Genomics	Whole-genome sequencing (WGS); rare disease genetics; variant analysis, prioritization, and interpretation; molecular laboratory methods.
Bioinformatics	R, Python, and Bash; NGS data processing and analysis; variant filtering and annotation.
Quality & Practice	Method development and optimization; documentation and data management; interdisciplinary and international collaboration.

**RESEARCH AND WORK EXPERIENCE**

- 2023 – now            **Visiting Postdoctoral Scholar**, The Novo Nordisk Foundation Center for Genomic Mechanisms of Disease, Broad Institute of MIT and Harvard, USA
- 2022 – now            **Postdoctoral Fellow**, University of Southern Denmark, Department of Biochemistry and Molecular Biology, DK
- Parental Leave** | April 2023 – April 2024
- 2022 – 2022            **Senior Researcher**, University of Fribourg, Department of Biology, CH
- 2017 – 2022            **Teaching Assistant**, University of Fribourg, Department of Biology, CH
- 2017 – 2022            **Postdoctoral Research Fellow**, University of Fribourg, Department of Biology, CH
- 2014                    **Visiting Scholar**, University of Pennsylvania, Department of Biology, USA
- 2014                    **Visiting Scholar**, Oxford Brookes University, Department of Biological & Medical Sciences, UK
- 2013 – 2017            **PhD Candidate**, University of Lausanne, Department of Ecology & Evolution, CH
- 2013 – 2017            **Teaching Assistant**, University of Lausanne, Department of Ecology & Evolution, CH
- 2010                    **Visiting Scholar**, UC San Diego, Division of Biological Sciences, USA
- 2009 – 2012            **Teaching Assistant**, Hacettepe University, Department of Biology, TR

**PUBLICATIONS**

- Cetnarowska, A., Hyldahl, M., Nygård, M., Dashti, H., Hansen, B. V., Holm, L., Madsen, K., Madsen, M., Shukla, V., **Durmaz Mitchell, E.**, Rauch, A., Madsen, J., Claussnitzer, M., & Mandrup, S. *Extensive enhancer crosstalk controls PPAR $\gamma$ 2 activation during adipogenesis in press, Nature Communications.*
- Núñez, J. C. B., Coronado-Zamora, M., Gautier, M., ... Kerdaffrec, E., **Durmaz Mitchell, E.**, ... Flatt, T., Bergland, A. O., & González, J. (2025). *Footprints of worldwide adaptation in structured populations of Drosophila melanogaster through the expanded DEST 2.0 genomic resource.* Molecular Biology and Evolution, 42(8), msaf132. doi.org/10.1093/molbev/msaf132
- Durmaz Mitchell E.**, Kerdaffrec E., Schmidt P., Flatt T., & Kittelmann S. (2025) *A balanced inversion polymorphism exhibits a dominance reversal at the gene expression level that depends on developmental context.* Mol. Biol. Evol. 42(9): msaf209. DOI: 10.1093/molbev/msaf209
- Durmaz Mitchell, E.**, Kerdaffrec, E., Harney, E., et al. (2025) *Continent-wide differentiation of fitness traits and patterns of climate adaptation among European populations of Drosophila melanogaster.* Evolution Letters, 9(4): 473–490. doi.org/10.1093/evlett/qraf014
- Paris, M., **Durmaz Mitchell, E.**, Kerdaffrec, E. *et al.* Multiple forms of balancing selection maintain inversion polymorphism. *Heredity* (2025). doi.org/10.1038/s41437-025-00780-y
- Rodrigues MA, Dauphin-Villemant, C Paris M, Kapun M, **Durmaz Mitchell E**, Kerdaffrec E, Flatt T. “Germline proliferation trades off with lipid metabolism in *Drosophila*”, *Evolution Letters*, 2024; doi.org/10.1093/evlett/grad059.
- Berdan EL, Barton NH, Butlin R, Charlesworth B, Faria R, Fragata I, Gilbert KJ, Jay P, Kapun M, Lotterhos K E, Mérot C, **Durmaz Mitchell E**, Pascual M, Peichel CL, Rafajlović M, Westram AM, Schaeffer SW, Johannesson K, & Flatt T (2023). “How chromosomal inversions reorient the evolutionary process”, *Journal of Evolutionary Biology*, 36, 1761–1782; doi.org/10.1111/jeb.14242.
- Kapun M, **Durmaz Mitchell E**, Kawecki T, Schmidt P, Flatt T. “An ancestral balanced inversion polymorphism confers global adaptation”, *Molecular Biology and Evolution*, 2023; doi.org/10.1093/molbev/msad118.

Rodrigues MA, Merckelbach A, **Durmaz E**, Kerdaffrec E, Flatt T. “Transcriptomic evidence for a trade-off between germline proliferation and immunity in *Drosophila*”, *Evolution Letters*, 2021; doi:10.1002/evl3.261.

Özsoy E, Yilmaz M, Patlar B, Emecen G, **Durmaz E**, Magwire MM, Zhou S, Anholt RRH, Mackay TFC. “Epistasis for head morphology in *Drosophila melanogaster*”, *G3 Genes|Genomes|Genetics*, 2021; 11:10–jkab285.

Betancourt N, Rajpurohit S, **Durmaz E**, Fabian DK, Kapun M, Thomas F, Schmidt P. “Allelic polymorphism at *foxo* contributes to local adaptation in *Drosophila melanogaster*”, *Molecular Ecology*, 2021; 00:1–14.

**Durmaz E**, Kerdaffrec E, Katsianis G, Kapun M, Flatt T. “How does selection act on chromosomal inversions?”, eLS (*Encyclopaedia of Life Sciences*), 2020; 1, 307–315.

**Durmaz E**, Rajpurohit S, Betancourt N, Fabian DK, Kapun M, Schmidt P, Thomas F. “A clinal polymorphism in the insulin signaling transcription factor *foxo* contributes to life-history adaptation in *Drosophila*”, *Evolution*, 2019; 73-9(5):1774-1792.

**Durmaz E**, Benson C, Kapun M, Schmidt P, Flatt T. “An inversion supergene in *Drosophila* underpins latitudinal clines in survival traits”, *Journal of Evolutionary Biology*, 2018; 31(9):1354-1364.

**Durmaz E**. “The Effects of Clinal Polymorphisms on *Drosophila* Life History”, PhD Thesis, 2017; University of Lausanne Open Archive.

Kapun M, Schmidt C, **Durmaz E**, Schmidt PS, Flatt T. “Parallel effects of the inversion *In(3R)Payne* on body size across the North American and Australian clines in *Drosophila melanogaster*”, *Journal of Evolutionary Biology*, 2016; 29(5):1059-72.

Demirci B, **Durmaz E**, Alten B. “Influence of Bloodmeal Source on Reproductive Output of the Potential West Nile Vector, *Culex theileri* (Diptera: Culicidae)”, *Journal of Medical Entomology*, 2014, 1;51(6):1312-6.

## **PRESENTATIONS AT CONFERENCES/ MEETINGS**

Cetnarowska A, Hyldahl M, Nygård M, Dashti H, Holm LK, **Durmaz Mitchell E**, Hansen BV, Shukla V, Madsen JGS, Claussnitzer M, Mandrup S. “Extensive enhancer crosstalk controls *PPARG2* activation during adipogenesis” – The Annual Meeting of the Novo Nordisc Foundation Center at the Broad Institute of Harvard and MIT, October 2023, Boston, USA – poster presentation

**Durmaz E**, Kerdaffrec E, Flatt T. “The forces maintaining a balanced inversion polymorphism”, ESEB 2022, August 2022, Prague, Czech Republic – poster presentation

**Durmaz E**, “Phenotyping WG updates – Analyses”, 12<sup>th</sup> DrosEU/DEST Workshop, June 2022, Belgrade, Serbia / online – invited speaker, chair

**Durmaz E**, “Phenotyping WG – Release of analyses”, DrosEU WG Meeting, February 2022, Switzerland / online – chair

**Durmaz E**, Kerdaffrec E, Flatt T. “Experimental Evolution of an Adaptive Inversion Polymorphism”, Evolution 2021, June 2021, USA / online – oral presentation

**Durmaz E**, “Phenotyping WG updates – data”, 11<sup>th</sup> DrosEU Workshop, June 2021, Europe / online – invited speaker, chair

Kerdaffrec E, **Durmaz E**, Katsianis G, Flatt T. “Testing evolutionary forces maintaining a clinal inversion polymorphism”, Evolution 2021, June 2021, USA / online – contribution, oral presentation

**Durmaz E**, Kerdaffrec E, Flatt T. “Experimental Evolution of an Adaptive Inversion Polymorphism”, 62nd Annual *Drosophila* Research Conference, March 2021, Genetic Society of America, USA / online – poster presentation

**Durmaz E**. “The DrosEU phenotyping collaboration”, A community-based approach to understanding *Drosophila* Evolution through Space and Time (DEST) Workshop, 62nd Annual *Drosophila* Research Conference, March 2021, Genetic Society of America, USA / online – invited speaker, chair

**Durmaz E.** “Patterns of Clinal adaptation in *Drosophila*”, Behaviour, Ecology, Environment and Evolution Seminar, University of Zurich, March 2021, Zurich, Switzerland / online – invited speaker

**Durmaz E.** “*Drosophila*’da enlemisel klinler ve adaptasyon” (in Turkish), University of Hacettepe, Department of Biology, January 2021, Ankara, Turkey / online – invited guest lecture for Genetics

Kerdaffrec E, **Durmaz E**, Katsianis G, Flatt T. “Testing evolutionary forces maintaining a clinal inversion polymorphism”, The Swiss Conference for Organismic Biology 2020, February 2020, Fribourg, Switzerland – contribution, oral presentation

**Durmaz E.** “Clinal adaptation in *Drosophila*”, 14<sup>th</sup> Aykut Kence Evolution Conference, January 2020, Ankara, Turkey – invited speaker for academic session

**Durmaz E.** “Adaptasyon genetiği” (in Turkish), 14<sup>th</sup> Aykut Kence Evolution Conference, January 2020, Ankara, Turkey – invited speaker for public session

**Durmaz E**, Kerdaffrec E, Katsianis G, Flatt T. “Testing evolutionary forces maintaining a clinal inversion polymorphism”, European *Drosophila* Research Conference (EDRC), September 2019, Lausanne, Switzerland – poster presentation

Demir E, Yagli SS, **Durmaz E**, Onder BS. “Seasonal immune response in a *Drosophila melanogaster* population”, The Congress of the European Society for Evolutionary Biology (ESEB), August 2019, Turku, Finland – contribution, poster presentation

**Durmaz E**, Kerdaffrec E, Katsianis G, Flatt T. “Testing evolutionary forces maintaining a clinal inversion polymorphism”, The Congress of the European Society for Evolutionary Biology (ESEB), August 2019, Turku, Finland – poster presentation

**Durmaz E**, Benson C, Kapun M, Schmidt P, Flatt T. “An inversion supergene in *Drosophila* underpins latitudinal clines in survival traits”, The Swiss Conference for Organismic Biology 2019, February 2019, Zurich, Switzerland – poster presentation

**Durmaz E.** “A clinal polymorphism at *foxo* contributes to life-history adaptation in *Drosophila*”, Society of Molecular Biology and Evolution (SMBE) Satellite Meeting, February 2019, Vienna, Austria – oral presentation (canceled)

**Durmaz E.** “The effects of clinal polymorphisms on *Drosophila* life history”, University of Hacettepe, Department of Biology, January 2019, Ankara, Turkey / online – invited guest lecturer for Genetics

**Durmaz E**, Benson C, Kapun M, Schmidt PS, Thomas F. “A clinal inversion in *Drosophila* represents a life-history supergene”, II Joint Congress on Evolutionary Biology, August 2018, Montpellier, France – poster presentation

**Durmaz E**, Benson C, Kapun M, Schmidt PS, Thomas F. “A clinal inversion in *Drosophila* represents a life-history supergene”, Ecology and Evolutionary Biology Symposium, July 2018, Izmir, Turkey – oral presentation

**Durmaz E**, Benson C, Kapun M, Schmidt PS, Thomas F. “Effects of a clinal inversion on thermal life-history reaction norms in *Drosophila melanogaster*” 16th Congress of the European Society for Evolutionary Biology (ESEB), August 2017, Groningen, Netherlands – poster presentation

**Durmaz E**, Rajpurohit S, Betancourt N, Schmidt PS, Thomas F. “A clinal polymorphism in insulin signaling has pleiotropic effects on *Drosophila* life history” Evolution Meeting, June 2016, Austin, Texas, USA – oral presentation

**Durmaz E**, Rajpurohit S, Betancourt N, Schmidt PS, Thomas F. “A clinal polymorphism in insulin signaling has major pleiotropic effects on *Drosophila* life history” The Swiss Conference for Organismic Biology 2016, February 2016, Lausanne, Switzerland – poster presentation

**Durmaz E**, Rajpurohit S, Betancourt N, Schmidt PS, Thomas F. “A clinal polymorphism in insulin signaling has major pleiotropic effects on *Drosophila* life history”, European Society for Evolutionary Biology (ESEB) XV meeting, August 2015, Lausanne, Switzerland – oral presentation

**Durmaz E**, Rajpurohit S, Betancourt N, Schmidt PS, Thomas F. “A clinal polymorphism in insulin signaling has major pleiotropic effects on *Drosophila* life history”, Swiss *Drosophila* Meeting, 2015 April, Lausanne, Switzerland – poster presentation

**Durmaz E**, Rajpurohit S, Betancourt N, Schmidt PS, Thomas F. “Testing the Life History Effects of SNP Polymorphisms as Identified by an NGS Analysis of a Latitudinal Cline in *Drosophila*”, Eukaryotic –Omics: Exploring and testing with next-generation sequencing, April 2014, Geneva, Switzerland – invited speaker

Hiroto Kameyama H, **Durmaz E**, Hanna G, Markow T. “Sperm length predicts female sperm loads in *Drosophila* species in the wild”, 54th Annual *Drosophila* Research Conference, April 2013 Washington, DC. USA – contribution, poster presentation

**Durmaz E**, Ozsoy E, Markow T. “The effect of mating status on environmental stress factors in genetically different natural populations of *Drosophila subobscura* (*Drosophilidae*, *Diptera*)”, 21th National Congress of Biology, September 2012, Izmir, Turkey – poster presentation

### **TEACHING RESPONSIBILITIES**

2018 – 2022	Experimental Ecology – University of Fribourg
2018 – 2020	Advanced Topics in Ecology and Evolution – University of Fribourg
2018 – 2019	Biological Invasions and Trophic Interactions – University of Fribourg
2017	Introduction to Scientific Writing, Experimental Design, Evolution of Life History and Aging – University of Lausanne
2016	Molecular Genetics, Zoology, Microbiology, Introduction to Scientific Writing, Experimental Design, Evolution of Life History and Aging – University of Lausanne
2015	Molecular Genetics, Zoology, Introduction to Scientific Writing, Experimental Design, Evolution of Life History and Aging – University of Lausanne
2014	Molecular Genetics, Zoology, Introduction to Scientific Writing, Evolution of Life History and Aging – University of Lausanne
2013	Molecular Genetics, Zoology – University of Lausanne

### **MEMBERSHIP IN PROFESSIONAL SOCIETIES/CONSORTIA**

DrosEU (European *Drosophila* Population Genetics Consortium)

ESEB (European Society for Evolutionary Biology)

EKOEVO (Ecology and Evolutionary Biology Society of Turkey)

500WS (500 Women in Science Fribourg/Bern Pod)

SMBE (Society of Molecular Biology and Evolution)

### **TRAINING AND SUPERVISION OF STUDENTS**

2022	Charlotte Suter, B.Sc. Thesis Project, University of Fribourg, CH
2021	Cécile Spichtig, B.Sc. Thesis Project, University of Fribourg, CH
2019 – 2021	Thibault Schowing, Training for lab assistantship, University of Fribourg, CH
2020	Sarah Descloux, Training for lab assistantship, University of Fribourg, CH
2020	Florian Baumgartner, B.Sc. Thesis Project, University of Fribourg, CH
2019 – 2020	Ekin Demir, M. Sc. Thesis co-advisor, Hacettepe University, TR

2019	Virginie Thieu, Training for lab assistantship, University of Fribourg, CH
2018	Jeanne Bruelhart, B.Sc. Thesis Project, University of Fribourg, CH
2016 - 2017	Clare Benson, Erasmus Program M.Sc. Placement, University of Lausanne, CH

### **SCHOLARSHIPS AND AWARDS**

05/2016	Travel grant, Fondation l'Université de Lausanne
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### **REVIEWER SERVICE**

*Scientific Reports, Molecular Ecology, Evolution, Evolution – Digests, Entomological Science, Molecular Genetics and Genomics, Journal of Gerontology, Molecular Biology and Evolution, Genome Research*

### **ADVANCED TRAINING**

03/2023	Anti-Harassment and Discrimination Training, Broad Institute of MIT and Harvard
03/2022	Train the trainer, ELIXIR-GOBLET-SIB, CH
06/2021	Increase your assertiveness in institutional power games, REGARD, CH
02/2021	Facilitation techniques for working groups, REGARD, CH
01/2021	Version control with Git, Swiss Institute of Bioinformatics, CH
11/2015	Project Management for Research, Lausanne, CH
03/2015	Time Management and Effectiveness, Lausanne, CH
12/2014	Scientific Writing Clinic, Neuchatel, CH
09/2014	Visiting scientist at McGregor Lab, training on embryonic injections and CRISPR/Cas9 genome editing techniques, Oxford Brookes University, Oxford, UK
04/2014	Visiting scientist at Schmidt Lab, training in geometric morphometric techniques, University of Pennsylvania, PA, USA

### **OTHER RESPONSIBILITIES**

2022 – now	Member of Transcriptomics and Protein Evolution Working Group, DrosEU
08/2022	Co-organiser of “Integrating -omics approaches for eco-evolutionary research” Summer School, DrosEU/European Society of Evolutionary Biologist Special Topics Network, Prague, Czech Republic
2020	Student/Postdoc Interview Committee for Professorship position at the Department of Biology, University of Fribourg
2019 – now	Co-Leader of e-bulletin Working Group, EKOEVO
2019 – now	Co-Leader of Finances Working Group, 500WS Fribourg/Bern Pod, Switzerland
2019 – now	Co-Founder of 500WS Fribourg/Bern Pod, Switzerland
2018 – now	Co-Leader of Phenotyping and Functional Genetics Working Group, DrosEU

2018 – now	Member of Clinal and Seasonal Variation Working Group, DrosEU
2018 – now	Member of Population Genetics Working Group, DrosEU
2018 – now	Member of Gender Equality Working Group, EKOEVO
2019 – 2020	Organizational help for The Swiss Conference for Organismic Biology 2020
2019	Co-organiser of “The temporal dynamics of evolution” Symposium, Fribourg Ecology and Evolution Days, Fribourg, Switzerland
2018	Organizational help for The Annual Swiss <i>Drosophila</i> meeting, Fribourg, Switzerland
2015- 2017	PhD Representative on the behalf of University of Lausanne, CUSO DPEE
2015	Organizational help for European Society for Evolutionary Biology (ESEB) XV meeting, Lausanne, Switzerland
2014-2015-2016	Mysteres de UNIL, Lausanne, Switzerland – Participation in public outreach event organization
2011-2012	Co-organiser of the 1 <sup>st</sup> /2 <sup>nd</sup> Student Congress of Evolutionary Biology, Hacettepe University, Ankara, Turkey

### **ACADEMIC REFEREES AND MENTORS**

*References available upon request. I kindly ask that referees be contacted only after I have been notified.*

#### **Prof. Susanne Mandrup**

Department of Biology, University of Fribourg  
 Campusvej 55, Odense M, DK-5230, Denmark  
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#### **Prof. Thomas Flatt**

Department of Biology, University of Fribourg  
 Chemin du Musée 10 CH-1700 Fribourg, Switzerland  
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#### **Prof. Josefa González**

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