Chiara Herzog, PhD

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EDUCATION

University of Edinburgh, Edinburgh, UK

- Ph.D. in Neuroscience — Oct 2015 – Apr 2019
  - Thesis: Molecular and cellular mechanisms of microglia-mediated neuroprotection
  - Supervisor: Dr. Leah Herrgen
  - Focus: Molecular and cellular biology, gene expression analysis using RNA-seq and qRT-PCR, computational analysis, statistics
- M.Sc. by Research in Integrative Neuroscience — Sep 2014 – Aug 2015
  - Graduated with distinction
  - Thesis: Molecular characterisation of the synaptic Disks large (Dlg)-associated signalling complex in *Drosophila melanogaster*
  - Supervisor: Prof. Seth Grant
  - Focus: Biochemistry and proteomics

Innsbruck Medical University, Innsbruck, AT

- B.Sc. in Molecular Medicine — Oct 2011 – Jul 2014
  - Graduated with distinction
  - Relevant courses: oncology, genetics and epigenetics, genomics, bioinformatics, biostatistics, general medicine
  - Thesis: Morphological analysis of hair follicles in Nogo receptor knockout mice
  - Supervisor: Prof. Christine Bandtlow

Meinhardinum, Stams, AT

- Matura (A-levels) — Jul 2011
  - Graduated with distinction and a grade average of 1.0 aged 16
  - Subjects: Physics, Chemistry, Mathematics, English, Latin

EXPERIENCE

University of Innsbruck, Innsbruck, AT

- Postdoctoral research fellow, EUTOPS Institute — Jul 2020 – present
  - Planned, implemented, and co-leading TirolGESUND study: investigation of the effects of lifestyle changes (intermittent fasting, smoking cessation) on health status and DNA methylation markers of disease risk
  - Leading computational biology team (4 members) and in charge of analysis of high-dimensional (epi)genetic data for ageing research and early detection and prevention of women's cancers
  - Development of DNA methylation-based classifier algorithms for disease detection and prediction using machine learning
  - Development of bioinformatic tools and distribution on GitHub
  - Advocate of FAIR (findable, accessible, interoperable, reusable) data principles and involvement in the Human Exposome Assessment Platform
  - Planning and lecturing, "Epigenetics and Cancer" course (Universität Innsbruck, Master's degree "Molecular cell and developmental biology")

BioClavis, Ltd., Glasgow, UK

- Associate Business Development Manager — Aug 2019 – Jun 2020
  - Scientific liaison for academic and clinical research collaborations in the space of cancer research at precision diagnostics company
  - Project management from conception to delivery

University of Edinburgh, Edinburgh, UK

- Postdoctoral research fellow, Centre for Discovery Brain Sciences — Mar 2019 – Aug 2019
  - Project title: Investigation of microglial-derived signalling factors in prevention of secondary neuronal cell death
  - Supervisor: Dr. Leah Herrgen
  - Focus: Molecular signalling pathways, gene expression analysis, data analysis, CRISPR/Cas9.
  - Investigated immune-derived signalling factors involved in neuroprotection identified from RNA-seq dataset using laboratory and computational methods (R gene expression analysis), resulting in a first-author publication
  - Supervision of Master's student
- PhD student, Centre for Discovery Brain Sciences — Oct 2015 – Apr 2019
  - Project: Molecular and cellular mechanisms of microglia-mediated neuroprotection
  - Supervisors: Dr. Leah Herrgen, Prof. Catherina Becker
  - Focus: Molecular and cellular biology (including RNA-seq, qRT-PCR), *in vivo* fluorescence confocal timelapse imaging, data analysis using R, Matlab, and GraphPad

- Primary research investigating the role of the immune system in central nervous system repair using a variety of molecular and cellular tools
- Launched successful project from scratch as the first PhD student in a newly established lab and published first-author manuscript
- Award of a travelling fellowship for two-month visit to collaborating research institution, and selection for presentation at scientific conference (only PhD student to present among senior postdocs and group leaders)

▪ Master's student, Centre for Clinical Brain Sciences Sep 2014 – Aug 2015
- Project: Molecular characterisation of the synaptic Disks large (Dlg)-associated signalling complex in *Drosophila melanogaster*
- Supervisor: Prof. Seth Grant
- Focus: Biochemistry and proteomics
- Extensive biochemical analysis of evolutionary conservation of large molecular protein complexes at the synapse, comparing *Drosophila*, human and mouse using co-immunoprecipitation, blue native-PAGE, and western blotting

Innsbruck Medical University, Innsbruck, AT

▪ Research Assistant, Division of Neurobiochemistry Apr 2014 – Sep 2014
- Supervisor: Prof. Christine Bandtlow
- Focus: Genotyping by PCR, dissection, immunohistochemistry & microscopy, statistical analysis, biochemistry
- Analysis of Nogo receptor knockout effects on dorsal root ganglia innervation using immunohistochemistry and image analysis

▪ Undergraduate project, Division of Neurobiochemistry Jan 2014 – Apr 2014
- Project: Morphological analysis of hair follicles in Nogo receptor knockout mice
- Supervisor: Prof. Christine Bandtlow
- Focus: Genotyping by PCR, dissection, immunohistochemistry & microscopy, image analysis, statistical analysis, biochemistry; Identified a critical role for the Nogo receptor in innervation of hairy skin, resulting in the creation of a follow-up PhD project

▪ Voluntary Internships Jun 2012 – Sep 2013
- Division of Neurobiochemistry (Supervisor: Prof. Christine Bandtlow), Jul 2013 - Sep 2013
- Division of Cell Biology (Supervisor: Prof. Lukas Huber), Jun 2012 - Aug 2012

PUBLICATIONS

JOURNALS

1 T. Bartlett, *et al.* "Antiprogestins reduce epigenetic field cancerization in breast tissue of young healthy women," *Genome Medicine*, *1*4 64, Jun 2022, *doi.org/10.1186/s13073-022-01063-5*.

2 J. E. Barrett*, C. Herzog*, Y.-N. Kim*, *et al.* "Susceptibility to hormone-mediated cancer is reflected by different tick rates of the epithelial and general epigenetic clock," *Genome Biology*, *2*3 52, Feb 2022, *doi.org/10.1186/s13059-022-02603-3*.

3 J. E. Barrett*, C. Herzog*, A. Jones, *et al.* "The WID-BC-index identifies women with primary poor prognostic breast cancer based on DNA methylation in cervical samples," *Nature Communications*, *1*3 449, Feb 2022, *doi.org/10.1038/s41467-021-27918-w*.

4 J. E. Barrett, A. Jones, I. Evans, D. Reisel, C. Herzog, *et al.* "The DNA methylome of cervical cells can predict the presence of ovarian cancer," *Nature Communications*, *1*3 448, Feb 2022, *doi.org/10.1038/s41467-021-26615-y*.

5 C. Herzog*, D. Greenald*, J. Larraz, M. Keatinge, and L. Herrgen. "RNA-seq analysis and compound screening highlight multiple signalling pathways regulating secondary cell death after acute CNS injury *in vivo*," *Biology Open*, *v*ol. 9, bio050260, May 2020, *doi.org/10.1242/bio.050260*.

6 C. Herzog, L. Pons Garcia, M. Keatinge, D. Greenald, C. Moritz, F. Peri, L. Herrgen. "Rapid clearance of cellular debris by microglia limits secondary neuronal cell death after brain injury *in vivo*," *Development*, vol. 146, dev174698, May 2019, *doi.org/10.1242/dev.174698*.

** contributed equally*

INVITED TALKS

"Harnessing the epigenetic footprint of cervical samples for breast and ovarian cancer detection and prediction," at *Young European Scientist Meeting*, Porto, Sep 2022.

"Monitoring lifestyle intervention in the human exposome – the HEAP lifestyle cohort," at *Frontiers in Human Exposome Research*, Graz, Jun 2022.

"Harnessing the epigenetic footprint of cervical samples for breast and ovarian cancer detection and prediction," at *British Association for Cytopathology Webinar*, Mar 2022.

CONFERENCE TALKS

C. Herzog and M. Widschwendter. "Exposures and the epigenome: linking the environment with inherited risk factors," at *European Human Exposome Network Scientific Meeting*, Barcelona, ES, May 2022.

C. Herzog and L. Herrgen. "Microglia limit secondary cell death following brain injury," at *Macrophages Satellite Symposium*, Edinburgh, UK, May 2018.

C. Herzog, D. Greenald and L. Herrgen. "Towards identifying mechanisms of inflammatory neuroprotection," at *Cardiovascular Sciences-Neuroscience Network Launch*, Edinburgh, UK, Feb 2018.

C. Herzog and L. Herrgen. "Microglia limit secondary cell death following brain injury," at *Centre for Integrative Physiology - Centre for Neuroregeneration Symposium*, Edinburgh, UK (winner of runner-up best talk), Jul 2017.

C. Herzog and L. Herrgen. "Microglia limit secondary cell death following brain injury," at *ImmuneFish*, Edinburgh, UK, Jan 2017.

MEDIA

"Frauen in der Forschung," Cafe Puls, Puls 4. May 2022.

Radio New Zealand Good Morning Show, NZ. Feb 2022.

Interview with Tiroler Tageszeitung. Feb 2022.

Interview with Tiroler Tageszeitung. Oct 2020.

TEACHING

- "*Data analysis and bioinformatics*," Jan 2023
  Biology (BSc), Universität Innsbruck. Introduction into data analysis, visualisation, statistics, and bioinformatics.
- "*Epigenetics and Cancer*," Jun 2022
  Molecular and Cellular Developmental Biology (MSc), Universität Innsbruck. Introduction into translational oncology, epigenetics research, clinical studies, biobanking, and ethics.

AWARDS & SCHOLARSHIPS

- FEBS Travel Grant Jun 2022
  Awarded Travel Grant from FEBS Youth Travel Fund to attend FEBS Ageing & Regeneration Advanced Course
- Falling Walls Lab Austria Winner Sep 2020
  Winner of Falling Walls Lab Scientific idea competition (Austria)
- University of Edinburgh PhD Scholarship Oct 2015 – Sep 2018
  Highly competitive full tuition scholarship
- Runner up Student Publication of the Year May 2018
  Awarded by the Scottish Newspaper Society to the Edinburgh University Science magazine, of which I was editor and president at the time
- FASEB Journal Travelling Fellowship Sep 2017
  Competitive travelling fellowship awarded for attendance of the ENABLE symposium in Barcelona
- Best Short Talk (Runner Up) May 2017
  Awarded at Centre for Integrative Physiology - Centre for Neuroregeneration symposium amongst 20 participants
- Company of Biologists Travelling Fellowship Oct 2016
  Competitive travelling fellowship to enable a new collaborative project and fund a two-month exchange to collaborator's institution

OTHER EXPERIENCE & ACTIVITIES

Pint of Science Austria, Innsbruck, AT

- City coordinator Nov 2021 – present
  - Recruitment and coordination of team members to deliver international science communication festival in Innsbruck
  - Coordination of sponsoring, merchandising, and press for events

- Organisation of “Tech Me Out” Event series
- Organisation of “Science of Beer” Event
- 14/15 events in Innsbruck sold out in first year

University of Edinburgh, Edinburgh, UK

- Laboratory Demonstrator — Sep 2018 – Mar 2019
  - Supervision and scientific training of undergraduate students in Cardiovascular Sciences and Medical Microbiology practicals

Edinburgh University Science Magazine, Edinburgh, UK

- President — May 2018 – May 2019
  - Representation and management of the student-run science magazine
- Editor — Oct 2016 – May 2018
  - Authored new articles, including on topics such as personalised medicine and medical ethics, and edited incoming articles
  - Contributed to idea conceptualisation for new issues

Cactus Communications

- Freelance editor (premium) — Nov 2018 – Mar 2019
  - Edited and reviewed scientific manuscripts in the area of molecular genetics and biomedical research for publication under tight deadlines

Pint of Science UK

- Team leader (Beautiful Mind) — Sep 2016 – May 2017
  - Approached key scientists in the field to present their work to a lay audience as part of the Pint of Science festival
  - Demonstrated excellent team management skills, and all events were sold out under my leadership

SKILLS

LABORATORY

DNA, RNA, and protein extraction; PCR, RT-qPCR, RNA-seq, molecular cloning, CRISPR/Cas9, FACS, immunohistochemistry, *in vivo* confocal microscopy, SDS-PAGE, BN-PAGE, western blotting (list non-exhaustive)

COMPUTATIONAL

Statistical analysis and bioinformatics (R/bash) including methylation, mutation, RNA-seq analysis, Git, computational image analysis (Matlab), TeX, HTML/CSS, Adobe Illustrator, Microsoft Office

PACKAGES

WIDCLOCKS

Calculation of epigenetic WID clocks.
doi: 10.5281/zenodo.5521015

WID.BC

Calculation of the WID-BC index for breast cancer identification and risk prediction.
doi: 10.5281/zenodo.5651989