

Matthew Norman Clarke

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Education

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| Ph.D. in Molecular Biology University of Vienna , Vienna, Austria | 2016-2023 |
| M.Sc. in Genetics and Molecular Medicine University of Edinburgh , Edinburgh, UK | 2014-2015 |
| B.Sc(Hons) in Molecular Genetics University of Edinburgh , Edinburgh, UK | 2010-2014 |
| International Baccalaureate diploma Vienna International School , Vienna, Austria | 2005-2010 |

Research Experience

Postdoctoral project
Center for Pathobiochemistry and Genetics, Medical University of Vienna,
Vienna, Austria 2023-present

Supervisor: Dr. Markus Schosserer, PhD

Project title: how do rRNA modifications affect lifespan in a *C. elegans* model?

- Bioinformatic analysis of overexpressed genes in *C. elegans* with a mutation in a key rRNA methyltransferase: NSUN-5
- RNAi knockdown of these highly expressed genes to test their contribution to increased lifespan and stress-tolerance
- Also elucidating how loss of RRP-8 increases lifespan and stress tolerance. For this we are designing a worm strain that has RRP-8 tagged with auxin and a GFP-fluorophore.
- Direct RNA nanopore sequencing of mutant *C. elegans* to test the affect such mutants have on rRNA modifications

Ph.D. project

Max Perutz Labs, University of Vienna, Vienna, Austria

2016-2023

PhD thesis advisor: Assoc. Prof. Christopher S. Campbell

Thesis title: Identification and characterization of point mutations that rescue loss of CPC function in budding yeast

- Performed Next Generation Sequencing (including DNA prep, library prep etc.) on over 100 individual yeast strains.
- Performed high-throughput screen and characterization of aneuploidies and point mutations using custom made scripts (including Python, unix-bash, and R)
- Cloned plasmids and genetically engineered many yeast strains with specific point mutations in genes of interest
- Analyzed phenotypes of these yeast strains using live-cell fluorescence microscopy, FRAP, western blots, various growth assays and minichromosome-loss assays
- Used ChimeraX to map point mutations on the surface of the DAM1-complex
- Identified a key mechanism for how cells cope with high levels of CIN (Clarke *et al.*, 2022, *EMBO J in revision*)

MSc project

IGMM, University of Edinburgh, Edinburgh, UK

2014-2015

M.Sc. advisor: Dr. Alexander Kagansky (deceased)

Thesis title: Analyzing the effects of epigenetic-silencing inhibitors on senescence related genes in a colorectal cancer cell-line

- Performed highthroughput immunofluorescence screen of different smallmolecule inhibitors (on a Hela cell-line) for their potential to reverse loss of genetic expression caused by methylation.
- Gained experience with mammalian cell-culture (HCT116) as well as lentiviral transfection
- Performed qPCR and western blotting of senescence related genes/proteins
- Utilized beta-galactosidase stains and prestoblue cell viability assays to test the small-molecule inhibitors effect on senescence and cell growth
- Identified HC-toxin as an excellent candidate for reactivating tumor suppressors specifically in cancer cells (Partolina *et al.*, 2017, *Cell Death Discovery*)

B.Sc(Hons) project

IGMM, University of Edinburgh, Edinburgh, UK

2013-2014

B.Sc(Hons) advisor: Dr. Alexander Kagansky (deceased)

Thesis title: Investigating the effects of bromodomain and extra-terminal (BET) protein inhibition on oncogene-induced senescence (OIS)

- Gained experience with immunofluorescence microscopy, mammalian cell culture, FACS and beta-galactosidase assays

Research Internships FAO, Seibersdorf labs, UN, Seibersdorf, Austria**Internship supervisor:** Charles Lamien

July-June, 2012 and 2013

- Designed simple, molecular diagnostic techniques for the PPR virus
- Helped identify drug targets by DNA sequencing of the PPR virus
- Gained experience with molecular cloning (PCR, gel electrophoresis, etc.), RT-qPCR, RNA purification, and c-DNA synthesis

Teaching Experience

Vienna International School (VIS), Vienna, Austria January-March 2022**Head of Science department:** Magdalena Tsavkova

- Full time supply teacher for International Baccalaureate (IB) higher-level and standard-level biology (grade 11 and 12)
- Full time supply teacher of Middle Year Program (MYP) biology (grade 10)

University of Vienna, Vienna, Austria

2018

- Bachelor's project supervisor

First Tutors UK, Edinburgh, UK

2014-2015

- Tutored high-school students in biology and chemistry (SQC)

Publications

Clarke MN, Marsoner T, Adell MAY, Ravichandran MC, Campbell CS. Adaptation to high rates of chromosomal instability and aneuploidy through multiple pathways in budding yeast. EMBO J. 2023 Apr 17;42(8):e111500. doi: 10.15252/embj.2022111500. Epub 2022 Dec 19. PMID: 36530167; PMCID: PMC10106982.

Ravichandran MC, Fink S, **Clarke MN**, Hofer FC, Campbell CS. Genetic interactions between specific chromosome copy number alterations dictate complex aneuploidy patterns. Genes Dev. 2018 Dec 1;32(23-24):1485-1498. doi: 10.1101/gad.319400.118. Epub 2018 Nov 21. PMID: 30463904; PMCID: PMC6295164.

Partolina M, Thoms HC, MacLeod KG, Rodriguez-Blanco G, **Clarke MN**, Venkatasubramani AV, Beesoo R, Larionov V, Neergeen-Bhujun VS, Serrels B, Kimura H, Carragher NO, Kagansky A. Global histone modification fingerprinting in human cells using epigenetic reverse phase protein array. Cell Death Discov. 2017 Mar 6;3:16077. doi: 10.1038/cddiscovery.2016.77. PMID: 28326191; PMCID: PMC5349387.

Research Presentations

Posters:

2023 Aging Research and Drug Discovery (ARDD) meeting, Copenhagen, Denmark
2021 Annual Meeting of the American Society for Cell Biology (ASCB), Online
2020 "Chromopalooza" meeting, Vienna, Austria
2019 Annual Meeting of the American Society for Cell Biology (ASCB), Washington DC
2018 Annual Meeting of the American Society for Cell Biology (ASCB), San Diego, CA

Management Experience

Max Perutz Labs, Vienna, Austria

February, 2020

Co-head of organization committee for "Chromopalooza – A festival to celebrate chromosome dynamics". 23 international speakers were featured at this two-day event.

Languages and Computational Skills

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| English: | Native speaker |
| German: | Professional working proficiency |
| Spanish: | Limited working proficiency |
| Python: | Advanced proficiency |
| Bash (Unix): | Basic proficiency |
| R: | Basic proficiency |
| Javascript: | Basic proficiency |
| ChimeraX: | Advanced proficiency |

References

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