**New Zealand RS&T Curriculum Vitae Template**

**PART 1**

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| **1a. Personal details** | | | | | | | |
| **Full name** | Title  Dr | First name  Miles | Second name(s)  C. | | | Family name  Benton | |
| **Present position** | Senior Scientist Bioinformatics / Computational Genomics | | | | | | |
| **Organisation/Employer** | Institute of Environmental Science and Research, NZ | | | | | | |
| **Contact Address** | Health, Human Genomics Team | | | | | | |
| Kenepuru Science Centre, 34 Kenepuru Drive, Kenepuru, Porirua | | | | | | |
|  | | | | **Post code** | | 5022 |
| **Work telephone** | +64 21 247 222 9 | | | **Mobile** | +64 21 247 222 9 | | |
| **Email** | [miles.benton84@gmail.com](mailto:miles.benton84@gmail.com); [miles.benton@esr.cri.nz](mailto:miles.benton@esr.cri.nz) | | | | | | |
| **Personal website** | [http://sirselim.github.io/](http://sirselim.github.io/about)  <https://github.com/sirselim> | | | | | | |

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| **1b. Academic qualifications** |

2014 PhD “Identification of Susceptibility Genes School of Medical Sciences,

for Metabolic Syndrome in the Isolated Griffith University, QLD, AUS Population of Norfolk Island”

2009 MSc Biomedical Science / Bioinformatics Victoria University of

“Mitochondrial Genome Variation and Wellington, NZ

Metabolic Traits in a Maori Community”

2007 BBMedSc Biomedical Science Victoria University of

(Human Genetics, Molecular Pathology) Wellington, NZ

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| **1c. Professional positions held** |

2019 – present Genomics Aotearoa, Bioinformatics Leadership Team (Health)

2018 – present Senior Scientist Bioinformatics, Institute of Environmental Science and Research (ESR), Porirua, NZ

2014 – June 2018 Postdoctural Research Fellow, Queensland University of Technology, Brisbane, AUS

2011 – present Part-time Lecturer for Research Preparation Course (CLNR-580), School of Biological Sciences, Victoria University of Wellington, NZ

2010 – 2020 Part-time Lecturer for Science and Ethics Course (BMSC 406), School of Biological Sciences, Victoria University of Wellington, NZ

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| **1d. Present research/professional speciality** |

My current role is as a Senior Scientist at ESR. I have extensive experience in computational genomics and bioinformatics, specialising in human health genomics. I completed a post doc at Queensland University of Technology (Brisbane, Australia) working on the development of methods to deal with ever expanding genomic data sets and their access and interpretation back to the people that matter (i.e. clients, clinicians, researchers, public, etc). Part of my role at ESR has been implementing deep learning techniques in several key genomic areas, including clinical variant calling/identification and base-calling of DNA sequence data. I am also leading the development of machine learning/AI technology on portable Nvidia modules for field/remote deployment and use. In May 2019 I was appointed to the Genomics Aoteoroa Bioinformatics Leadership Team, where I am responsible for overseeing bioinformatics support for health projects across New Zealand. I am also heavily involved in the Data Carpentries as an instructor and facilitator, and am a mentor on ESR's data science accelerator programme.

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| **1e. Total years research experience** | 7 years (post PhD) |
| **1f. Professional distinctions and memberships (including honours, prizes, scholarships, boards or governance roles, etc)** | |

**Research Grants**

2019 - present PI, ESR Strategic Science Investment Funding: *Clinically Relevant Human Genomics at ESR*

2019 - 2020 PI, ESR Pioneer Funding: *Growing ESRs genomics reputation – compiling and refining a eukaryotic reference genome*

2015 PI, Wellington Medical Research Foundation: *Validation of Blood Cell Lineage Specific DNA methylation markers*

**Honours and Distinctions**

2021 Science New Zealand Awards - Early Career Researcher of the Year

2019 Mentor – Royal Society Powering Potential

2019 Data Carpentries Instructor

2017 QUT Travel Award

2016 QUT Carla Patterson Award – Best Paper, Early Career Researcher

2015 ESR Vision Best Paper Award

2014 Best Poster Presentation, Genemappers Conference, Barossa Valley Australia

2012 Inaugural Grasshopper prize for Scientific Innovation. Wellington Health and Biomedical Research Society, Victoria University of Wellington,

2012 Best Student Presenter. 2nd Biomarker Discovery Conference, Shoal Bay NSW, Australia

2010 - 2013 Griffith University Higher Degree Research Scholarship 2010-2013.

2007 - 2010 ESR Masters Research Scholarship

**Publication Metrics**

Google Scholar h-index of 19, i10-index of 26 (from 1263 citations)

Scopus h-index of 15 (cited 839 times)

**Supervision**

2018 - present Co-supervisor – 2 PhD students (Otago University/ESR)

Co-supervisor – Masters student (University of Canterbury) - completed

Supervisor – Bioinformatics Honours Student (QUT) - completed

2016 Completed QUT Effective Supervisory Practices Level 1

**Professional Memberships and Related Experience**

2021 Committee Chair, Health Research Council (HRC) of New Zealand

2020 - 2021 Health Research Council Review panel member

2019 – present Member Human Genomics Society of Australasia

2015 – present Ad hoc reviewer, Genome Biology, Gene, BMC Medical Genetics, Frontiers in Immunology, Frontiers in Genetics, Clinical Epigenetics

2015 – present Reviewer HRC NZ, Reviewer National Health and Medical Research Council, Australia and Australian Research Council, Australia

2014 – present Member Australasian Genomic Technologies Association (AGTA)

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| **1g. Total number of *peer reviewed* publications and patents** | Journal articles | Books | Book chapters, books edited | Conference proceedings | Patents |
| 46 |  |  | 38 |  |

**PART 2**

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| **2a. Research publications and dissemination** |
| Peer-reviewed journal articles (**last 5 years**) |
| Tran NK, Lea RA, Holland S, Nguyen Q, Raghubar AM, Sutherland HG, **Benton MC**, Haupt LM, Blackburn NB, Curran JE, Blangero J, Mallett AJ, and Griffiths LR. (2021) *Multi-phenotype genome-wide association studies of the Norfolk Island isolate implicate pleiotropic loci involved in chronic kidney disease*. Scientific Reports Volume 11, Article number: 19425  Connell J, **Benton MC**, Lea RA, Sutherland H, Chaseling J, Haupt LM, Wright K, and Griffiths LR. (2021) *Pedigree Derived Mutation Rate Across the Entire Mitochondrial Genome of the Norfolk Island Population*. Scientific Reports DOI: 10.21203/rs.3.rs-823709/v1  Cao TV, Lea RA, Sutherland HG, Benton MC, Pishva SR, Haupt LM, and Griffiths LR. (2021) *A genome-wide methylation study of body fat traits in the Norfolk Island Isolate*. Nutrition, Metabolism and Cardiovascular Diseases, 31(5) - 1556-1563  Macartney-Coxson D, Cameron AM, Clapham J, and Benton MC. (2020) *DNA methylation in blood-potential to provide new insights in immune cell biology*. PLoS ONE 15(11): e0241367  Harvey NR, Voisin S, Lea RA, Yan X, **Benton MC**, Papadimitriou ID, Jacques M, Haupt LM, Ashton KJ, Eynon N, and Griffiths LR. (**2020**) *Investigating the influence of mtDNA and nuclear encoded mitochondrial variants on high intensity interval training outcomes*. Scientific Reports 10, 11089.  Osborne AJ, Pearson JF, Noble AJ, Gemmell NJ, Horwood LJ, Boden JM, **Benton MC**, Macartney-Coxson D, and Kennedy MA. (**2020**) *Genome-wide DNA methylation analysis of heavy cannabis exposure in a New Zealand longitudinal cohort*. Translational Psychiatry 10(114)  Macartney-Coxson D, Danielson K, Clapham J, **Benton MC**, Johnstone A, Jones A, Shaw O, Hagan RD, Hoffman EP, Hayes M, Harper J, Langston MA, and Stubbs RS. (**2020**) *MicroRNA profiling in adipose before and after weight-loss highlights the role of miR-223-3p and the NLRP3 inflammasome*. Obesity*28*(3)  Dunn PJ, Maher BH, Albury CL, Stuart S, Sutherland HG, Maksemous N, Benton MC, Smith, RA, Haupt LM, and Griffiths LR. (**2020**) *Tiered analysis of whole-exome sequencing for epilepsy diagnosis*. Molecular Genetics and Genomics https://doi.org/10.1007/s00438-020-01657-x  Harvey NR, Voisin S, Lea RA, Yan X, MC Benton, Papadimitriou ID, Jacques M, Haupt LM, Ashton KJ, Eynon N, Griffiths and LR. (**2020**) *Identification of novel mitochondrial and mitochondrial related genetic loci associated with exercise response in the Gene SMART study*. biorxiv (DOI: https://doi.org/10.1101/2020.02.20.957340)  Harvey NR, Albury CL, Stuart S, **Benton MC**, Ecccles DA, Connell J, Sutherland HG, Allcock RJ, Lea RA, Haupt LM, and Griffiths LR. (**2019**) *Ion torrent high throughput mitochondrial genome sequencing (HTMGS)*. PLoS ONE 14(11):e0224847  **Benton MC**, Lea RA, Macartney-Coxson D, Sutherland HG, White NM, Kennedy DW, Mengersen K, Haupt LM, and Griffiths LR. (**2019**) *Genome-wide allele-specific methylation is enriched at gene regulatory regions in a multi-generation pedigree from the Norfolk Island isolate*. Epigenetics and Chromatin 12(60)  **Benton MC**, Smith RA, Haupt LM, Albury CL, Maksemous N, Lea RA, and Griffiths LR. (**2019**) *A Customisable Analysis Pipeline for Identification of Clinically Relevant Genetic Variants in Next Generation Sequencing Data*. Journal of Molecular Diagnostics 21(6) Macartney-Coxson D, Cameron A, Clapham J, and Benton MC. (2019) *DNA methylation in blood - potential to provide new insights in immune cell biology*. PREPRINT (Version 1) available at Research Square [DOI: https://doi.org/10.21203/rs.2.13274/v1] Kennedy DW, White NM, **Benton MC**, Lea RL and Mengersen K. (**2019)** *Cell-type specific analysis of heterogeneous methylation signal using a Bayesian model-based approach*. biorxiv (doi: https://doi.org/10.1101/682070)  Kennedy D, White NM, **Benton MC**, Fox A, Scott R, Griffiths LR, Mengersen KL and Lea RA. (**2018)** *Critical evaluation of linear regression models for cell-subtype specific methylation signal from mixed blood cell DNA*. PLoS ONE (accepted 27th Nov 2018)  MaltbyV, Lea RA, Graves M, Sanders K, **Benton MC**, Tajouri L, Scott R, and Lechner-Scott J. (**2018**) *Genome-wide DNA methylation changes in CD19+ B cells from relapsing-remitting multiple sclerosis patients*. Scientific Reports  Aquino EM, **Benton MC**, Haupt LM, Sutherland HG, Griffiths LR, and Lea RA. (**2018**) *Current understanding of DNA methylation and age-related disease.* OBM Genetics 2  Bradshaw G, Lualhati RL, Albury CL, Maksemous N, Roos-Araujo D, Smith RA, **Benton MC**, Eccles DA, Lea RA, Sutherland HG, Haupt LM and Griffiths LR. (**2018**) *Exome sequencing diagnoses X-linked moesin-associated immunodeficiency in a primary immunodeficiency case*. Frontiers in Immunology 9  Dunn P, Albury CL, Maksemous N, **Benton MC**, Sutherland HG, Smith RA, Haupt LM, and Griffiths LR. (**2018**) *Next Generation Sequencing Methods for Diagnosis of Epilepsy Syndromes.* Frontiers in Genetics 9  Jones A, Danielson KM, **Benton MC**, Ziegler O, Shah R, Stubbs RS, Das S, and Macartney-Coxson D. (**2017**) *miRNA signatures of insulin resistance in obesity.* Obesity 25(10)  White NM, **Benton MC**, Kennedy D, Fox A, Griffiths LR, Lea RA, and Mengersen KL. (**2017**) *Accounting for cell lineage and sex effects in the identification of cell-specific DNA methylation using a Bayesian model selection algorithm.* PLoS One 12(9)  Maltby V, Lea RA, Sanders K, White NM, **Benton MC**, Scott R, and Lechner-Scott J. (**2017**) *Differential Methylation at MHC in CD4+ T cells is associated with multiple sclerosis independently of HLA-DRB1.* Clinical Epigenetics 9(71)  Macartney-Coxson D, **Benton MC**, Blick R, Stubbs RS, Hagan RD, and Langston MA. (**2017**) *Genome-wide DNA methylation analysis reveals loci that distinguish different types of adipose tissue in obese individuals.* Clinical Epigenetics 9(48)  **Benton MC**, Sutherland HG, Macartney-Coxson D, Haupt LM, Lea RA, and Griffiths LR. (**2017**) *Methylome-wide association study of whole blood DNA in the Norfolk Island isolate identifies robust loci associated with age.* Aging  Stuart S, **Benton MC**, Eccles D, Sutherland H, Haupt LM, Lea RA and Griffiths LR. (**2017**) *Gene-Centric Analysis Implicates Nuclear Encoded Mitochondrial Protein Gene Variants in Migraine Susceptibility.* Molecular Genetics & Genomic Medicine  Sanders KA, **Benton MC**, Lea RA, Maltby VE, Agland S, Griffin N, Scott RJ, Tajouri L and Lechner-Scott J. (**2016**) *Next-generation sequencing reveals broad down-regulation of microRNAs in secondary progressive multiple sclerosis CD4+ T-cells.* Clinical Epigenetics 8(87)  Fernando S, Speicher DJ, Bakr MM, **Benton MC**, Lea RA, Scuffham PA and Johnson NW. (**2015**) *A Protocol for assessing maternal, environmental and epigenetic risk factors for dental caries in children.* BMC Oral Health 15(167)  **Benton MC**, Lea RA, Macartney-Coxson D, Carless MA, Bellis C, Hanna M, Eccles D, Chambers GK, Curran JE, Blangero J and Griffiths LR. (**2015**) *Serum bilirubin concentration is modified by UGT1A1 Haplotypes and Influences Risk of Type-2 Diabetes in the Norfolk Island Genetic Isolate.* BMC Genetics 16(1)  Maltby VE, Graves MC, Lea RA, **Benton MC**, Sanders KA, Tajouri L, Scott RJ and Lechner-Scott J. (**2015**) *Genome-wide DNA methylation profiling of CD8+ T cells shows a distinct epigenetic signature to CD4+ T cells in Multiple Sclerosis patients.* Clinical Epigenetics  **Benton MC**, Lea RA, Macartney-Coxson D, Carless MA, Göring HH, Bellis C, Hanna M, Eccles D, Chambers GK, Curran JE, Harper JL, Blangero J and Griffiths LR. (**2015**) *A phenomic scan of the Norfolk Island genetic isolate identifies a major pleiotropic effect locus associated with renal disorder markers.* PLoS Genetics 11(10)  **Benton MC**, Stuart S, Bellis C, Macartney-Coxson D, Eccles D, Curran JE, Chambers G, Blangero J, Lea RA, and Griffiths LR. (**2015**) *'Mutiny on the Bounty': The Genetic History of Norfolk Island reveals extreme gender biased admixture.* Investigative Genetics 6(11)  Bosch P, **Benton MC**, Macartney-Coxson D, Kivell B. (**2015**) *mRNA and microRNA analysis reveals modulation of biochemical pathways related to addiction in the ventral tegmental area of methamphetamine self-administering rats.* BMC Neuroscience 16(1)  ROHgen Consortium (**2015**) *Directional dominance on stature and cognition in diverse human populations.* Nature 523, 459–462  **Benton MC**, Johnstone A, Eccles D, Harmon B, Hayes MT, Lea RA, Griffiths LR, Hoffman E, Stubbs RS, Macartney-Coxson D. (**2015**) *An analysis of DNA methylation in human adipose tissue reveals differential modification of obesity genes before and after gastric bypass and weight-loss.* Genome Biology 16(1) |
| |  | | --- | | Other forms of dissemination |   In November 2020 I was invited to give a Key Story presentation at Research Bazaar Auckland, where I spoke about our work developing portable genomic technology with a lens on community empowerment:  **Benton MC.** *Harnessing the disruptive nature of portable sequencing for community empowerment.* Auckland Research Bazaar, 24th November 2020.  I recently gave a 2 hour seminar for the University of Otago Genetics department around the use of NGS technologies and pipelines for Clinical Genetics in NZ:  **Benton MC.** *Clinical Genomics: Customisable Analysis Workflows for Identification of Clinically Relevant Genetic Variants - An Update.* Otago Genetics Seminar, University of Otago, Dunedin, NZ, August 24th **2020**.  I gave several presentations at NZ universities around the projects and initiatives that we have been working on at ESR since I started in July 2018:  **Benton MC**. *Genomics and Data Science at ESR ...something a little different...* University of Otago, Dunedin, NZ, October 17th **2019**.  **Benton MC**. *Genomics and Data Science at ESR ...something a little different...* University of Otago, Dunedin, NZ, August 20th **2019**.  I was invited to give a plenary at a Victoria University of Wellington clinical research symposium:  All of my presentations are available online (<http://sirselim.github.io/presentations/>).  I also host a series of open-access workshops/tutorials on my personal website and GitHub (<http://sirselim.github.io/workshops-tutorials/>). These are available and accessed by the general public, and several are used in university courses I teach.  **Media:** Recently (2020/2021) my work in portable sequencing using Nanopore technology has been generating a lot of national and international interest:   * Radio New Zealand - Saturday morning interview with Kim Hill: [Miles Benton: diagnosing serious illnesses cheaper and faster](https://www.rnz.co.nz/national/programmes/saturday/audio/2018815703/miles-benton-diagnosing-serious-illnesses-cheaper-and-faster) * *NZ herald article:* [The genius of genomics: The revolution that helped NZ quash Covid-19](https://www.nzherald.co.nz/nz/the-genius-of-genomics-the-revolution-that-helped-nz-quash-covid-19/EFJWSHSL3TTYNNKYA5WEROIKHY/) * *ESR media:* [ESR scientists showcase benefits of collaboration for rapid-DNA sequencing](https://www.esr.cri.nz/home/about-esr/media-releases/esr-scientists-showcase-benefits-of-collaboration-for-rapid-dna-sequencing/) |