

# Dr. Philipp Bayer

Postdoctoral researcher

## contact

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## languages

German: mother tongue  
English: fluent  
French & Japanese:  
advanced

## programming

Python + R  
Go, Perl, Bash, Java  
Ruby on Rails,  
JavaScript, HTML  
SLURM, PBS Pro

## research

Genomics of complex  
traits in plants

## statistics

Citations: 4,132  
h-index: 25  
i10-index: 38

## education

- 2012–2015 **PhD Applied Bioinformatics** University of Queensland, Brisbane  
Working in the Applied Bioinformatics group on the use of genotyping by sequencing to improve the genome assembly of canola.  
Thesis submission date: 23rd September 2015. Date of acceptance: 4th May 2016.
- 2010–2012 **Master of IT** Bond University, Gold Coast  
Graduated with High Distinction
- 2006–2009 **Bachelor of Science Biology** University of Münster, Germany  
Thesis: Analysis of splicing in two populations of marine plants using bioinformatic approaches

## employment

- 2021–2023 **DECRA Fellow** UWA, Perth  
My first step towards an independent lab with funding for the first PhD-student primarily supervised by me and with \$448,781 in government and \$418,772 UWA funding. I am modeling mechanisms of gene loss and birth in crops to learn where new genes come from, and how to avoid loss of agronomically important genes.
- 2017–2020 **Forrest Fellow** UWA, Perth  
Edwards Lab. Continued work on genomics of complex plants with Forrest Foundation support. Supervised three PhD students and four MSc students to completion.
- 2015–2017 **Postdoctoral researcher** UWA, Perth  
Edwards Lab. Researched genetics of complex plants with a focus on canola and wheat. Worked closely with industry partners to improve their breeding programs. Preparing, writing, and publishing research. Supervised two interns, Co-supervised four PhD students and one MSc student, system-administrator for the local computational infrastructure and group data manager. Worked extensively on an ARC Industrial Transformation Training Centre application (2018 round).

## publications

- Yang, H., Saad, N. S. M., Ibrahim, M. I., **Bayer, P. E.**, Neik, T. X., Severn-Ellis, A. A., Pradhan, A., Tirnaz, S., Edwards, D., Batley, J., “Candidate Rlm6 resistance genes against *Leptosphaeria. maculans* identified through a genome-wide association study in *Brassica juncea* (L.) Czern” *Theoretical and Applied Genetics* (2021) pp. 1–16. Springer Berlin Heidelberg
- Yang, H., **Bayer, P. E.**, Tirnaz, S., Edwards, D., Batley, J., “Genome-Wide Identification and Evolution of Receptor-Like Kinases (RLKs) and Receptor like Proteins (RLPs) in *Brassica juncea*” *Biology* 10.1 (2021) p. 17. Multidisciplinary Digital Publishing Institute
- Valliyodan, B., Brown, A. V., Wang, J., Patil, G., Liu, Y., Otyama, P. I., Nelson, R. T., Vuong, T., Song, Q., Musket, T. A., “Genetic variation among 481 diverse soybean accessions, inferred from genomic re-sequencing” *Scientific data* 8.1 (2021) pp. 1–9. Nature Publishing Group
- Danilevicz, M. F., Fernandez, C. G. T., Marsh, J. I., **Bayer, P. E.**, Edwards, D., “High-Throughput Genotyping Technologies in Plant Taxonomy”. In: *Molecular Plant Taxonomy*. Humana, New York, NY, 2021, pp. 149–166 Li, P., Su, T., Zhao, X., Wang, W., Zhang, D., Yu, Y., **Bayer, P. E.**, Edwards, D., Yu,

- S., Zhang, F., “Assembly of the non-heading pak choi genome and comparison with the genomes of heading Chinese cabbage and the oilseed yellow sarson” *Plant Biotechnology Journal* (2020). John Wiley & Sons, Ltd
- Bayer, P. E.**, Edwards, D., “Machine learning in agriculture: from silos to marketplaces” *Plant Biotechnology Journal* (2020)
- Mercé, C., **Bayer, P. E.**, Tay Fernandez, C., Batley, J., Edwards, D., “Induced Methylation in Plants as a Crop Improvement Tool: Progress and Perspectives” *Agronomy* 10.10 (2020) p. 1484. *Multidisciplinary Digital Publishing Institute*
- Tirnaz, S., **Bayer, P. E.**, Inturrisi, F., Zhang, F., Yang, H., Dolatabadian, A., Neik, T. X., Severn-Ellis, A., Patel, D. A., Ibrahim, M. I., “Resistance gene analogs in the Brassicaceae: Identification, characterization, distribution, and evolution” *Plant Physiology* 184.2 (2020) pp. 909–922. *American Society of Plant Biologists*
- Bayer, P. E.**, Golicz, A. A., Scheben, A., Batley, J., Edwards, D., “Plant pan-genomes are the new reference” *Nat. Plants* 6 (2020) pp. 914–920
- Tirnaz, S., Merce, C., **Bayer, P. E.**, Severn-Ellis, A. A., Edwards, D., Batley, J., “Effect of *Leptosphaeria maculans* infection on promoter DNA methylation of defence genes in *Brassica napus*” *Agronomy* 10.8 (2020) p. 1072. *Multidisciplinary Digital Publishing Institute*
- Inturrisi, F., **Bayer, P. E.**, Yang, H., Tirnaz, S., Edwards, D., Batley, J., “Genome-wide identification and comparative analysis of resistance genes in *Brassica juncea*” *Molecular Breeding* 40.8 (2020) pp. 1–14. *Springer Netherlands*
- Dolatabadian, A., **Bayer, P. E.**, Tirnaz, S., Hurgobin, B., Edwards, D., Batley, J., “Characterization of disease resistance genes in the *Brassica napus* pangenome reveals significant structural variation” *Plant biotechnology journal* 18.4 (2020) pp. 969–982
- Golicz, A. A., **Bayer, P. E.**, Bhalla, P. L., Batley, J., Edwards, D., “Pangenomics comes of age: From bacteria to plant and animal applications” *Trends in Genetics* 36.2 (2020) pp. 132–145. *Elsevier Current Trends*
- Anderson, R., Fernandez, C. T., Yuan, Y., Golicz, A. A., Edwards, D., **Bayer, P. E.**, “Method for Genome-Wide Association Study: A Soybean Example”. In: *Legume Genomics*. Humana, New York, NY, 2020, pp. 147–158
- Hu, H., Yuan, Y., **Bayer, P. E.**, Fernandez, C. T., Scheben, A., Golicz, A. A., Edwards, D., “Legume Pangenome Construction Using an Iterative Mapping and Assembly Approach”. In: *Legume Genomics*. Humana, New York, NY, 2020, pp. 35–47 Danilevicz, M. F., Fernandez, C. G. T., Marsh, J. I., **Bayer, P. E.**, Edwards, D., “Plant pangenomics: approaches, applications and advancements” *Current Opinion in Plant Biology* 54 (2020) pp. 18–25. *Elsevier Current Trends*
- Zhao, J., **Bayer, P. E.**, Ruperao, P., Saxena, R. K., Khan, A. W., Golicz, A. A., Nguyen, H. T., Batley, J., Edwards, D., Varshney, R. K., “Trait associations in the pangenome of pigeon pea (*Cajanus cajan*)” *Plant Biotechnology Journal* (2020)
- Anderson, R., **Bayer, P. E.**, Edwards, D., “Climate change and the need for agricultural adaptation” *Current Opinion in Plant Biology* (2020). *Elsevier Current Trends*
- Yuan, Y., **Bayer, P. E.**, Anderson, R., Lee, H., Chan, C.-K. K., Zhao, R., Batley, J., Edwards, D., “RefKA: A fast and efficient long-read genome assembly approach for large and complex genomes” *BioRxiv* (2020). *Cold Spring Harbor Laboratory*
- Furaste Danilevicz, M., Danilevicz, M. F., Tay Fernandez, C. G., Marsh, J. I., **Bayer, P. E.**, Edwards, D., “Plant pangenomics: approaches, applications and advancements” (2020)
- Valliyodan, B., Cannon, S. B., **Bayer, P. E.**, Shu, S., Brown, A. V., Ren, L., Jenkins, J., Chung, C. Y.-L., Chan, T.-F., Daum, C. G., “Construction and comparison of three reference-quality genome assemblies for soybean” *The Plant Journal* 100.5 (2019) pp. 1066–1082

- Kreplak, J., Madoui, M.-A., Cápál, P., Novák, P., Labadie, K., Aubert, G., **Bayer, P. E.**, Gali, K. K., Syme, R. A., Main, D., “A reference genome for pea provides insight into legume genome evolution” *Nature genetics* 51.9 (2019) pp. 1411–1422. *Nature Publishing Group*
- Dolatabadian, A., **Bayer, P. E.**, Tirnaz, S., Hurgobin, B., Edwards, D., Batley, J., “Characterisation of disease resistance genes in the Brassica napus pangenome reveals significant structural variation” *Plant Biotechnology Journal* (Aug. 2019). *Wiley*
- Tahghighi, H., Erskine, W., Bennett, R., **Bayer, P. E.**, Pazos Navarro, M., Kaur, P., “Genetic diversity linked to haplotype variation in the world core collection of *Trifolium subterraneum* for boron toxicity tolerance provides valuable marker s for pasture breeding” *Frontiers in Plant Science* 10 (Aug. 2019) pp. 1–19
- M, M.-D., S, C., G, T., M, D., PE, B., D, E., MN, N., W, E., FJ, L.-R., J, C., JK, H., “Prediction of pathogenicity genes involved in adaptation to a lupin host in the fungal pathogens *Botrytis cinerea* and *Sclerotinia sclerotiorum* via comparative genomics.” *BMC genomics* (May 2019)
- Kreplak, J., Madoui, M.-A., Cápál, P., Novák, P., Labadie, K., Aubert, G., **Bayer, P. E.**, Gali, K. K., Syme, R. A., Main, D., Klein, A., Bérard, A., Vrbová, I., Fournier, C., d’Agata, L., Belser, C., Berrabah, W., Toegelová, H., Milec, Z., Vrána, J., Lee, H., Kougbeadjo, A., Térézol, M., Huneau, C., Turo, C. J., Mohellibi, N., Neumann, P., Falque, M., Gallardo, K., McGee, R., Tar’an, B., Bendahmane, A., Aury, J.-M., Batley, J., Paslier, M.-C. L., Ellis, N., Warkentin, T. D., Coyne, C. J., Salse, J., Edwards, D., Lichtenzweig, J., Macas, J., Doležel, J., Wincker, P., Burstin, J., “A reference genome for pea provides insight into legume genome evolution” *Nature Genetics* 51.9 (Sept. 2019) pp. 1411–1422. *Springer Science and Business Media LLC*
- Valliyodan, B., Cannon, S. B., **Bayer, P. E.**, Shu, S., Brown, A. V., Ren, L., Jenkins, J., Chung, C. Y.-L., Chan, T.-F., Daum, C. G., Plott, C., Hastie, A., Baruch, K., Barry, K. W., Huang, W., Patil, G., Varshney, R. K., Hu, H., Batley, J., Yuan, Y., Song, Q., Stupar, R. M., Goodstein, D. M., Stacey, G., Lam, H.-M., Jackson, S. A., Schmutz, J., Grimwood, J., Edwards, D., Nguyen, H. T., “Construction and comparison of three reference-quality genome assemblies for soybean” *The Plant Journal* (Aug. 2019). *Wiley*
- Scheben, A., Verpaalen, B., Lawley, C. T., Chan, C.-K. K., **Bayer, P. E.**, Batley, J., Edwards, D., “Crop-SNPdb: a database of SNP array data for Brassica crops and hexaploid bread wheat” *The Plant Journal* 98.1 (2019) pp. 142–152. *Wiley Online Library*
- Anderson, R., Edwards, D., Batley, J., **Bayer, P. E.**, “Genome-Wide Association Studies in Plants” *eLS* (2019) pp. 1–7. *Wiley Online Library*
- Mousavi-Derazmahalleh, M., **Bayer, P. E.**, Hane, J. K., Valliyodan, B., Nguyen, H. T., Nelson, M. N., Erskine, W., Varshney, R. K., Papa, R., Edwards, D., “Adapting legume crops to climate change using genomic approaches” *Plant, cell & environment* 42.1 (2019) pp. 6–19
- Taylor, C. M., Kamphuis, L. G., Zhang, W., Garg, G., Berger, J. D., Mousavi-Derazmahalleh, M., **Bayer, P. E.**, Edwards, D., Singh, K. B., Cowling, W. A., “INDEL variation in the regulatory region of the major flowering time gene *LanFTc1* is associated with vernalization response and flowering time in narrow-leaved lupin (*Lupinus angustifolius* L.)” *Plant, cell & environment* 42.1 (2019) pp. 174–187. *Impact Factor: 6.173*
- Melonek, J., Zhou, R., **Bayer, P. E.**, Edwards, D., Stein, N., Small, I., “High intraspecific diversity of Restorer-of-fertility-like genes in barley” *The Plant Journal* 97.2 (2019) pp. 281–295. *Wiley Online Library*
- Bayer, P. E.**, Golicz, A. A., Tirnaz, S., Chan, C.-K. K., Edwards, D., Batley, J., “Variation in abundance of predicted resistance genes in the Brassica oleracea pangenome” *Plant biotechnology journal* 17.4 (2019) pp. 789–800
- Bayer, P. E.**, Edwards, D., Batley, J., “Bias in resistance gene prediction due to repeat masking” *Nature Plants* 4.10 (2018) p. 762. *Nature Publishing Group*

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- The International Wheat Genome Sequencing Consortium (IWGSC), “Shifting the limits in wheat research and breeding using a fully annotated reference genome” *Science* 361.6403 (Aug. 2018) *eaar7191*
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- Lee, H., Golicz, A. A., **Bayer, P. E.**, Severn-Ellis, A. A., Chan, C.-K. K., Batley, J., Kendrick, G. A., Edwards, D., “Genomic comparison of two independent seagrass lineages reveals habitat-driven convergent evolution” *Journal of experimental botany* 69.15 (2018) pp. 3689–3702. *Oxford University Press UK*. Impact factor: 5.830
- Mousavi-Derazmahalleh, M., **Bayer, P. E.**, Nevado, B., Hurgobin, B., Filatov, D., Kilian, A., Kamphuis, L. G., Singh, K. B., Berger, J. D., Hane, J. K., “Exploring the genetic and adaptive diversity of a pan-Mediterranean crop wild relative: narrow-leaved lupin” *Theoretical and Applied Genetics* 131.4 (2018) pp. 887–901. *Springer*
- Hurgobin, B., Golicz, A. A., **Bayer, P. E.**, Chan, C.-K. K., Tirnaz, S., Dolatabadian, A., Schiessl, S. V., Samans, B., Montenegro, J. D., Parkin, I. A., “Homoeologous exchange is a major cause of gene presence/absence variation in the amphidiploid *Brassica napus*” *Plant Biotechnology Journal* 16.7 (2018) pp. 1265–1274. Impact Factor: 6.09, JCR Plant Sciences 11/209 (Q1), Altmetric score: 6
- Schneider, M. V., Griffin, P. C., Tyagi, S., Flannery, M., Dayalan, S., Gladman, S., Watson-Haigh, N., **Bayer, P. E.**, Charleston, M., Cooke, I., “Establishing a distributed national research infrastructure providing bioinformatics support to life science researchers in Australia” *Briefings in bioinformatics* 20.2 (2017) pp. 384–389. *Oxford University Press*
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- Yuan, Y., **Bayer, P. E.**, Lee, H.-T., Edwards, D., “runBNG: a software package for BioNano genomic analysis on the command line” *Bioinformatics* 33.19 (2017) pp. 3107–3109. *Oxford University Press*. Impact factor: 7.3
- Yuan, Y., **Bayer, P. E.**, Scheben, A., Chan, C.-K. K., Edwards, D., “BioNanoAnalyst: a visualisation tool to assess genome assembly quality using BioNano data” *BMC Bioinformatics* 18.1 (2017) p. 323. *BioMed Central*. Impact factor: 2.4
- Bayer, P. E.**, Hurgobin, B., Golicz, A. A., Chan, C.-K. K., Yuan, Y., Lee, H., Renton, M., Meng, J., Li, R., Long, Y., “Assembly and comparison of two closely related *Brassica napus* genomes” *Plant Biotechnology Journal* 15.12 (2017) pp. 1602–1610. Impact Factor: 6.09, JCR Plant Sciences 11/209 (Q1), Altmetric score: 11
- Yuan, Y., **Bayer, P. E.**, Batley, J., Edwards, D., “Improvements in Genomic Technologies: Application to Crop Genomics” *Trends in Biotechnology* 35.6 (2017) pp. 547–558. Impact Factor: 12.06, JCR Biotechnology and Applied Microbiology 3/161 (Q1), Altmetric score: 7
- Montenegro, J. D., Golicz, A. A., **Bayer, P. E.**, Hurgobin, B., Lee, H., Chan, C.-K. K., Visendi, P., Lai, K., Dolezel, J., Batley, J., Edwards, D., “The pangenome of hexaploid bread wheat” *The Plant Journal* 90.5 (2017) pp. 1007–1013. Best paper award (Plant Journal) 2017 Resource - Bronze, Impact Factor: 5.46,

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- Gacek, K., **Bayer, P. E.**, Bartkowiak-Broda, I., Szala, L., Bocianowski, J., Edwards, D., Batley, J., “Genome-wide association study of genetic control of seed fatty acid biosynthesis in *Brassica napus*” *Frontiers in Plant Science* 7 (2017) p. 2062. *Frontiers Media SA*. Impact Factor: 4.49, JCR Plant Sciences 15/209 (Q1)
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- Hane, J. K., Ming, Y., Kamphuis, L. G., Nelson, M. N., Garg, G., Atkins, C. A., **Bayer, P. E.**, Bravo, A., Bringans, S., Cannon, S., Edwards, D., Foley, R., Gao, L.-l., Harrison, M. J., Huang, W., Hurgobin, B., Li, S., Liu, C.-W., McGrath, A., Morahan, G., Murray, J., Weller, J., Jian, J., Singh, K. B., “A comprehensive draft genome sequence for lupin (*Lupinus angustifolius*), an emerging health food: insights into plant–microbe interactions and legume evolution” *Plant Biotechnology Journal* 15.3 (2017) pp. 318–330. Citations: 6, Impact Factor: 6.09, JCR Plant Sciences 11/209 (Q1), Altmetric score: 15
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- Lee, H., Golicz, A. A., **Bayer, P.**, Jiao, Y., Tang, H., Paterson, A. H., Sablok, G., Krishnaraj, R. R., Chan, C.-K. K., Batley, J., Kendrick, G. A., Larkum, A. W., Ralph, P. J., Edwards, D., “The genome of a southern hemisphere seagrass species *Zostera muelleri*” *Plant Physiology* 172.1 (2016) pp. 272–283. *American Society of Plant Biologists*. Citations; 3, Impact Factor: 6.28, JCR Plant Sciences 8/209 (Q1), Altmetric score: 6
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- Bayer, P. E.** “Skim-Based Genotyping by Sequencing Using a Double Haploid Population to Call SNPs, Infer Gene Conversions, and Improve Genome Assemblies”. In: *Plant Bioinformatics: Methods and Protocols*. Ed. by David Edwards. Springer New York, 2016, pp. 285–292
- Bayer, P. E.**, Ruperao, P., Mason, A. S., Stiller, J., Chan, C.-K. K., Hayashi, S., Long, Y., Meng, J., Sutton, T., Visendi, P., “High-resolution skim genotyping by sequencing reveals the distribution of crossovers and gene conversions in *Cicer arietinum* and *Brassica napus*” *Theoretical and Applied Genetics* 128.6 (2015) pp. 1039–1047. *Springer Berlin Heidelberg*. Citations: 14, Impact Factor: 3.9, JCR Agronomy 5/83 (Q1)
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- Greshake, B., **Bayer, P. E.**, Rausch, H., Reda, J., "OpenSNP—a crowdsourced web resource for personal genomics" *PLoS One* 9.3 (2014) e89204. *Public Library of Science*. Citations: 26, Impact Factor: 3.057, JCR Multidisciplinary Sciences 11/63 (Q1), Altmetric score: 61
- Dattolo, E., Gu, J., **Bayer, P. E.**, Mazzuca, S., Serra, I. A., Spadafora, A., Bernardo, L., Natali, L., Cavallini, A., Procaccini, G., "Acclimation to different depths by the marine angiosperm *Posidonia oceanica*: transcriptomic and proteomic profiles" *Frontiers in Plant Science* 4 (2013) p. 195. *Frontiers*

## experience

- 2021–Current **Member, Scientific Advisory Panel Machine Learning** ARDC  
Member of the scientific advisory panel for ongoing machine learning projects supported by the ARDC.
- 2012–2018 **Research collaboration with Bayer CropScience, later BASF** Ghent, Belgium  
Continued collaboration with Bayer CropScience on their plant breeding projects which includes several week-long visits to Bayer.
- 2011–Current **Co-founder openSNP.org** Germany/Australia  
A project for customers of genotyping companies like 23andMe to share their data with scientists around the world, for free. Partially wrote and still maintain the site's Ruby on Rails code-base, interact and manage with the community of 5000 users, administration of the site's servers, and supervision of contributors.
- 2013–Current **Software Carpentry and Data Carpentry instructor** Australia  
Certified Software Carpentry and Data Carpentry instructor. Software Carpentry is a Mozilla/Alfred P. Sloan Foundation funded non-profit organization which teaches best programming practices (structured programming, reproducible research, version control etc.) in bootcamps to scientists around the world. Data Carpentry is a sister-organisation that focuses on teaching best data management practices.
- 2018 **Research Bazaar Organising committee** UWA, Perth  
ResBaz is a world-wide three-day festival promoting digital literacy. As member of the organising committee I searched for helpers and teachers, drafted the timeplan, designed the web page, raised funding, succeeded in getting government MP to hold keynote
- 2017–Current **Hacky Hour Founder** UWA, Perth  
Founded the Hacky Hour at UWA, a weekly get-together of researchers and staff working with programming and data, doubles as a help-desk for students with programming problems.
- 2017–2019 **Mozilla Open Science Leadership mentor** UWA, Perth  
Mentoring open source programmers and researchers on how to streamline and grow open source and open science projects under the umbrella of Mozilla.
- 2016–2019 **EMBL-ABR Head of Nodes member, Open Science Special Interest Group member** UWA, Perth  
EMBL-ABR is an Australian-wide network supporting the technical needs of life sciences researchers. Members of the group of Head of Nodes meet monthly to discuss the way forward for the organisation. The Open Science Special Interest Group meets bimonthly to discuss how EMBL-ABR can advance open science in Australia.
- 2016–2017 **COMBINE WA Representative** UWA, Perth  
COMBINE is the student and early career researcher subcommittee of the Australian Bioinformatics and Computational Biology Society (ABACBS). As the local representative I organise or help organise workshops and regular networking events.

## awards & funding

|           |   |                          |
|-----------|---|--------------------------|
| 2021–2023 | <b>Grant: ARC Discovery Early Career Research Award</b><br>Awarded DECRA for 2021-2023. Total funding: \$448,781 and \$418,772 in UWA funding.  | UWA                      |
| 2020–2022 | <b>Grant: Identifying genetic contributors to canola blackleg resistance in the presence of environmental effects using Machine Learning</b><br>With Prof. Dave Edwards, Prof. Mohammed Bennamoun, Dr. Farid Boussaid, Prof. Jacqueline Batley. Total funding: \$309,524. | GRDC                     |
| 2020–2022 | <b>Grant: Machine Learning - Project E: Deep Learning for early detection and classification of crop disease and stress</b><br>With Prof. Mohammed Bennamoun, Dr. Farid Boussaid, Prof. Dave Edwards, Dr. Nic Taylor. Total funding: \$344,971.                           | GRDC                     |
| 2019      | <b>Woodside Early Career Scientist of the Year, finalist</b><br>Finalist in Premier's Science Awards 2019   | UWA                      |
| 2018      | <b>Rising Stars nomination</b><br>Two early career researchers per UWA research school were nominated for Rising Stars, a university-wide event where researchers introduce a public audience to their research   | UWA                      |
| 2018      | <b>Forrest Research Foundation Non-stipendiary Fellowship</b><br>Three year fellowship to pursue research at UWA, part of the three inaugural Forrest Fellows   | UWA                      |
| 2017      | <b>UWA Research Collaboration Award</b><br>\$28,100 to fund a seagrass microbiome sequencing project  | UWA                      |
| 2014      | <b>GRDC Travel Award</b><br>Travel cost scholarship   | GRDC                     |
| 2014      | <b>SAFS Travel Award</b><br>Travel cost scholarship   | University of Queensland |
| 2013      | <b>Bayer Grants4Apps</b><br>Grant to cover openSNP running costs  | Bayer HealthCare         |
| 2011–2014 | <b>Two postgraduate scholarships</b><br>My PhD was supported by two scholarships from UQ for tuition fees and living costs.   | University of Queensland |
| 2012      | <b>First place in PLOS/Mendeley Binary Challenge</b><br>Won first prize in a competition aimed towards the advancement of open science  | Won with openSNP.org     |
| 2009-2011 | <b>Master IT</b><br>5x Top of class, 3x Vice-Chancellor's List for Academic Excellence, 1x IT Award Academic Excellence. Graduated with High Distinction. Recipient of John Oglethorpe Medal for highest GPA of all IT students graduating that semester                  | Bond University          |

## teaching

|              |   |   |
|--------------|---|---|
| 2021–Current | <b>University teaching</b><br>Organised new MSc Bioinformatics with new unit, SCIE5003 (advanced bioinformatics). Developed content of SCIE5003 and SCIE4002, taught into both units. | UWA, Perth                                |
| 2019         | <b>Introduction to genomics on the command line</b><br>Introduction to the command line, bioinformatics analyses and pipelines, and basic SNP analysis in R                           | Research Bazaar, Curtin University, Perth |
| 2019         | <b>Introduction to tidyverse and caret in R</b><br>Introduction to R, tidyverse, ggplot2, caret, and basic statistics in R. Taught over two days.                                     | UWA School of Human Sciences, Perth       |



|              |   |   |
|--------------|---|---|
| 2018         | <b>Introduction to modern R</b>   | Telethon Kids Institute, Perth                          |
|              | Introduction to R, tidyverse, ggplot2, and basic statistics approaches in R. Taught over two days.  |   |
| 2018         | <b>Teaching Data Carpentry</b>  | Research Bazaar, University of Western Australia, Perth |
|              | Introduction to genomics and shell. Part of the planning committee.   |   |
| 2017         | <b>Teaching Software Carpentry</b>  | Research Bazaar, Curtin University, Perth               |
|              | Introduction to data manipulation using Python  |   |
| 2016         | <b>Teaching and hosting Data Carpentry</b>  | UWA, Perth  |
|              | Hosted, planned, and set up the first Data Carpentry workshop at UWA, taught best data management practices   |   |
| 2016–Current | <b>University teaching</b>  | UWA, Perth  |
|              | Co-teach and co-supervise SCIE4002, computational analysis for biology and biomedical MSc students. Set up and maintain the computational infrastructure needed for practicals. In 2017, the course has been judged 'consistently excellent' over six semesters based on student evaluations. |   |
| 2016         | <b>Teaching Software Carpentry</b>  | Curtin University, Perth                                |
|              | Taught introduction to Python   |   |
| 2016         | <b>Teaching Software Carpentry</b>  | Research Bazaar, Murdoch University, Perth              |
|              | Taught introduction to Python and git   |   |
| 2016         | <b>Teaching and hosting Software Carpentry</b>  | University of Queensland, Brisbane                      |
|              | Hosted, planned, and set up the first Software Carpentry workshop at UQ. Taught introduction to programming.  |   |
| 2014         | <b>Teaching Software Carpentry</b>  | Sydney  |
|              | Taught basic to intermediate Python.  |   |
| 2014         | <b>Teaching Software Carpentry</b>  | PyCon AU/University of Queensland                       |
|              | Taught basic to intermediate Python.  |   |
| 2013         | <b>Teaching Software Carpentry</b>  | Adelaide  |
|              | Assisted Software Carpentry bootcamp in Adelaide  |   |
| 2009–2011    | <b>Tutoring</b>   | Bond University   |
|              | Tutored students in Intro to Programming (Java), Database Management (Oracle/MySQL) and Networks & Applications, held several all-day refresher courses before exams  |   |

## presentations

|      |   |              |
|------|---|--------------|
| 2021 | <b>Machine learning in plant breeding and bioinformatics</b>                  | Invited talk |
|      | CINVESTAV, online   |              |
| 2021 | <b>Future-ready crops for a changing climate: the role of bioinformatics</b>  | Invited talk |
|      | UWA DVCR Forrest Foundation seminar series                                    |              |
| 2021 | <b>Bioinformatics at scale panel Q&amp;A</b>                                  | Invited Q&A  |
|      | Pawsey Supercomputing Centre  |              |
| 2021 | <b>Interpretable machine learning in bioinformatics</b>                       | Invited talk |
|      | ABACBS online seminar series  |              |
| 2020 | <b>Our machine learning technical stack</b>                                   |              |
|      | GRDC Tech seminar series  |              |
| 2020 | <b>Predicting Gene Loss in Plants: Lessons Learned from Laptop-Scale Data</b> |              |
|      | Plant And Animal Genome conference, San Diego                                 |              |

|      |   |              |
|------|---|--------------|
| 2019 | <b>Eukaryotic pangenomics: where we've been, where we're going</b><br>Bayliss Seminar Series, Perth   | Invited talk |
| 2019 | <b>Assembling complex plant genomes – things I wish someone would have told me earlier</b><br>AGRF Seminar Series, Perth  | Invited talk |
| 2019 | <b>Helping Biologists Make Sense of Plant Variant and Annotation Data</b><br>Plant And Animal Genome conference, San Diego  |              |
| 2018 | <b>Feeding the future world: safe-guarding Australia's food bowl in a changing climate</b><br>Rising Stars, UWA   |              |
| 2018 | <b>From QTLs to candidate genes, or: There and Back Again</b><br>Institute of Agriculture Seminar Series, UWA   | Invited talk |
| 2018 | <b>The path of least resistance (genes) - mining plant genomes for disease resistance</b><br>COMBINE/Pawsey bioinformatics symposium                                  | Invited talk |
| 2018 | <b>Early Career Researcher Panel - What have I learnt at the beginning of my research career?</b><br>Combined Biological Sciences Meeting 2018                        |              |
| 2018 | <b>ScienceCafe - STEM outreach aimed at year 10 students</b><br>UWA   |              |
| 2017 | <b>The future of wheat research</b><br>Wheat showcase, UWA  |              |
| 2017 | <b>Skipping the assembly step – what we can learn from looking at sequences directly</b><br>Pawsey Roadshow, UWA, Perth   |              |
| 2017 | <b>The State of Bioinformatics in High Performance Computing in 2017</b><br>HPCAC Conference, Perth   |              |
| 2017 | <b>Towards better plant breeding at UWA</b><br>COMBINE event, Perth   |              |
| 2017 | <b>Improving Plant Breeding using KNetMiner</b><br>Plant And Animal Genome conference, San Diego  |              |
| 2016 | <b>Towards a canola pan-genome: cautionary tales from the assembly bench</b><br>CCDM, Curtin University   | Invited talk |
| 2016 | <b>Sharing Experience: What Can We Learn from Each Other Developing Plant Informatics Systems</b><br>Plant And Animal Genome conference, San Diego                    |              |
| 2015 | <b>Assessing and validating the amphidiploid genome of <i>Brassica napus</i> using genotyping by sequencing</b><br>Plant And Animal Genome conference, San Diego      |              |
| 2015 | <b>Using skim-based genotyping by sequencing for trait association and QTL cloning in <i>Brassica napus</i></b><br>Plant And Animal Genome conference, San Diego      |              |
| 2014 | <b>Assembling and validating the genome of the <i>Brassica napus</i> using skim-based genotyping by sequencing</b><br>University of Queensland, GenGen Seminar Series |              |
| 2012 | <b>openSNP: Crowdsourcing Genome Wide Association Studies</b><br>28th Chaos Communication Congress, Berlin  |              |