

# David Wheeler, PhD

## Education

- 2003 **PhD, Department of Molecular Life Sciences, University of Adelaide.**  
"The globen genes of the Tammar wallaby"
- 1997 **B.Sc. Honours (First Class), Department of Genetics, University of Adelaide.**
- 1996 **B.Sc. (Jurisprudence), University of Adelaide.**  
Majoring in Genetics and Law

## Employment

- 2018–now **Data Science Team**, Department of Primary Industries, NSW.
- 2017–2018 **Bioinformatician and Managing director**, Nextgen Bioinformatic Services Ltd, NZ.
- 2013–2017 **Lecturer in Genomics and Bioinformatics**, Institute of Fundamental Sciences, Massey University, NZ (0.8 FTE).
- 2013–2017 **Bioinformatician**, New Zealand Genomics Ltd, NZ (0.2 FTE).
- 2010–2013 **Postdoctoral Fellow**, Bioinformatician, PI Prof. John Werren, Department of Biology, University of Rochester, NY, USA.
- 2008–2010 **Postdoctoral Fellow**, Bioinformatician, PI Prof. Michael Herman, Ecological Genomics Institute, Kansas State University, KS, USA.
- 2005–2007 **Postdoctoral Fellow**, Molecular biologist, PI A/Prof. Edward Newbigin, Department of Botany, University of Melbourne, AUS.
- 2002–2003 **Research Assistant**, Department of Physiology, University of Adelaide, AUS.
- 2002 **Research Assistant**, Evolutionary Biology Unit, SA State Museum, AUS.

## Bioinformatics

- Mappers BWA, STAR, GEM, tophat, hisat2, bbmap
- RNA-seq DESeq2, edgeR, cufflinks, ballgown, DEXseq
- SNP/WGBS GATK, freebayes, samtools, SNPeff, vcftools, bsmmap package
- Marker plink, tassell, stacks, gbs-snp-crop
- Assembly SOAP *de novo*, velvet, oases, trinity, IDBA-UD, SPAdes, MIRA, ABySS, canu
- Metagenomics DIAMOND/PAUDA, megan, QIIME, phyloseq, flash
- Phylogenetics PAUP, MrBayes, paml, phylip
- QC SolexQA, cut-adapt, fastq-mcf, bbduk
- Homology NCBI-BLAST tools, muscle, clustalw2
- Misc git, Geneious, Galaxy, tmux, vim, javascript D3 plotting library

## Computer skills

- Advanced Python, bash
- Proficient HTML,  $\text{\LaTeX}$ , web frameworks (Django, flask), R, javascript
- Basic Perl, JAVA

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## Awards and grants

- 2017 **Royal Society of NZ Marsden Fund**, Associate investigator on successful applications 17-MAU-023 and 17-MAU-119, combined funding \$1,700,000 NZD.
- 2016 **Health Research Council NZ**, Associate investigator successful application "Targeting HP1 regulated pathways to suppress breast cell invasion", funding \$199,792 NZD.
- 2016 **Massey University Research Fund**, Associate investigator on successful application "Investigating the molecular basis of P uptake in green algae to support decentralized wastewater treatment in rural communities", funding \$14,000 NZD.
- 2015 **Massey University Research Fund**, Primary investigator on successful application "Exploring the transcriptome dynamics of a intracellular bacteria and its host using RNA-seq", funding \$24,000 NZD.

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## Professional activities

- Reviewer Molecular Biology and Evolution, BMC Genomics, PLoSOne, The Database Journal, Scientific Reports, Journal of Venom research, Bioinformatics, Toxins and Biology Insights.
- Grant review Ministry of Business Innovation and Employment New Zealand (phase I and II), Austrian Science Fund, Research Foundation Flanders.

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## Peer reviewed publications (25)

Shuyan Wu, Pak-Lam Yu, David Wheeler Wheeler, and Steve Flint. Transcriptomic study on persistence and survival of listeria monocytogenes following lethal treatment with nisin. *J Glob Antimicrob Resist*, June 2018.

Ningxin Zhang, David Wheeler, Mauro Truglio, Cristina Lazzarini, Jenine Upritchard, Wendy McKinney, Karen Rogers, Anna Prigitano, Anna Tortorano, Richard Cannon, Roland Broadbent, Sally Roberts, and Jan Schmid. Multi-locus next-generation sequence typing of dna extracted from pooled colonies detects multiple unrelated candida albicans strains in a significant proportion of patient samples. *Frontiers in Microbiology*, 9:1179, 2018.

Benjamin Bridgeman, Mary Morgan-Richards, David Wheeler, and Steven A Trewick. First detection of wolbachia in the new zealand biota. *PloS one*, 13(4):e0195517, 2018.

Andrea Clavijo McCormick, Ewald Grosse-Wilde, David Wheeler, Mark C Mescher, Bill S Hansson, and Consuelo M De Moraes. Comparing the expression of olfaction-related genes in gypsy moth (*lymantria dispar*) adult females and larvae from one flightless and two flight-capable populations. *Frontiers in Ecology and Evolution*, 5:115, 2017. Journal IF=6.4.

Maxence Plouviez, David Wheeler, Andy Shilton, Michael A Packer, Patricia A McLenachan, Emanuel Sanz-Luque, Francisco Ocaña-Calahorro, Emilio Fernández, and Benoit Guieysse. The biosynthesis of nitrous oxide in the green alga *chlamydomonas reinhardtii*. *Plant J.*, 91(1):45–56, July 2017. Journal IF=5.901.

Andre D Sim and David Wheeler. The venom gland transcriptome of the parasitoid wasp *Nasonia vitripennis* highlights the importance of novel genes in venom function. *BMC Genomics*, 17:571, 2016. Journal IF=3.867.

Joshua B Benoit, Zach N Adelman, Klaus Reinhardt, Amanda Dolan, Monica Poelchau, Emily C Jennings, Elise M Szuter, Richard W Hagan, Hemant Gujar, Jayendra Nath Shukla, and Others. Unique features of a global human ectoparasite identified through sequencing of the bed bug genome. *Nat. Commun.*, 7, 2016. Journal IF=11.329.

Antonia Klein, Lukas Schrader, Rosario Gil, Alejandro Manzano-Marín, Laura Flórez, David Wheeler, John H Werren, Amparo Latorre, Jürgen Heinze, Martin Kaltenpoth, and

Others. A novel intracellular mutualistic bacterium in the invasive ant *Cardiocondyla obscurior*. *ISME J.*, 10(2):376–388, 2016. Journal IF=9.438.

Chaoyang Zhao, Lucio Navarro Escalante, Hang Chen, Thiago R Benatti, Jiaxin Qu, Sanjay Chellapilla, Robert M Waterhouse, David Wheeler, Martin N Andersson, Riyue Bao, and Others. A massive expansion of effector genes underlies gall-formation in the wheat pest *Mayetiola destructor*. *Curr. Biol.*, 25(5):613–620, 2015. Journal IF=9.571.

Aisha L Siebert, David Wheeler, and John H Werren. A new approach for investigating venom function applied to venom calreticulin in a parasitoid wasp. *Toxicon*, 107:304–316, 2015. Journal IF=2.708.

Aisha L Siebert, Jeremy Wright, Ellen Martinson, David Wheeler, John H Werren, and Others. Parasitoid venom induces metabolic cascades in fly hosts. *Metabolomics*, 11(2):350–366, 2015. Journal IF=3.995.

Ellen O Martinson, David Wheeler, Jeremy Wright, Aisha L Siebert, John H Werren, and Others. *Nasonia vitripennis* venom causes targeted gene expression changes in its fly host. *Mol. Ecol.*, 23(23):5918–5930, 2014. Journal IF=6.330.

Maria S Tretiakova, Sarah D Bond, David Wheeler, Alejandro Contreras, Masha Kocherginsky, Todd G Kroll, and Tracy K Hale. Heterochromatin protein 1 expression is reduced in human thyroid malignancy. *Lab. Invest.*, 94(7):788–795, 2014. Journal IF=3.676.

Jin-Hua Xiao, Zhen Yue, Ling-Yi Jia, Xin-Hua Yang, Li-Hua Niu, Zhuo Wang, Peng Zhang, Bao-Fa Sun, Shun-Min He, Zi Li, and Others. Obligate mutualism within a host drives the extreme specialization of a fig wasp genome. *Genome Biol.*, 14(12):1–18, 2013. Journal IF=11.313.

Xu Wang, David Wheeler, Amanda Avery, Alfredo Rago, Jeong-Hyeon Choi, John K Colbourne, Andrew G Clark, and John H Werren. Function and evolution of DNA methylation in *Nasonia vitripennis*. *PLoS Genet.*, 9(10):e1003872, 2013. Journal IF=8.555.

David Wheeler, Amanda J Redding, and John H Werren. Characterization of an ancient lepidopteran lateral gene transfer. *PLoS One*, 8(3):e59262, 2013. Journal IF=3.702.

David Wheeler, Brian J Darby, Timothy C Todd, and Michael A Herman. Several grassland soil nematode species are insensitive to RNA-mediated interference. *J. Nematol.*, 44(1):92, 2012. Journal IF=1.081.

Jungsun Park, Zuogang Peng, Jia Zeng, Navin Elango, Taesung Park, David Wheeler, John H Werren, and V Yi Soojin. Comparative analyses of DNA methylation and sequence evolution using nasonia genomes. *Mol. Biol. Evol.*, 28(12):3345–3354, 2011. Journal IF=13.649.

Brian J Darby, Kenneth L Jones, David Wheeler, and Michael A Herman. Normalization and centering of array-based heterologous genome hybridization based on divergent control probes. *BMC Bioinformatics*, 12(1):183, 2011. Journal IF=2.435.

David Wheeler and Ed Newbigin. Expression of 10 s-class SLF-like genes in *Nicotiana glauca* pollen and its implications for understanding the pollen factor of the S locus. *Genetics*, 177(4):2171, 2007. Journal IF=5.963.

Steven J B Cooper, David Wheeler, Alison De Leo, Jan-Fang Cheng, Robert A B Holland, Jennifer A Marshall Graves, and Rory M Hope. The mammalian  $\alpha^D$ -globin gene lineage and a new model for the molecular evolution of  $\alpha$ -globin gene clusters at the stem of the mammalian radiation. *Mol. Phylogenet. Evol.*, 38(2):439–448, 2006. Journal IF=4.018.

Steven J B Cooper, David Wheeler, Rory M Hope, Gaynor Dolman, Kathleen M Saint, Andrew A Gooley, and Robert A B Holland. The  $\alpha$ -globin gene family of an australian marsupial, *Macropus eugenii*: the long evolutionary history of the  $\theta$ -globin gene and its functional status in mammals. *J. Mol. Evol.*, 60(5):653–664, 2005. Journal IF=1.863.

Alison A De Leo, David Wheeler, Christophe Lefevre, J-F Cheng, R Hope, J Kuliwaba, K R Nicholas, M Westerman, and JAM Graves. Sequencing and mapping hemoglobin gene clusters in the australian model dasyurid marsupial *Sminthopsis macroura*. *Cytogenet. Genome Res.*, 108(4):333–341, 2004. Journal IF=1.764.

David Wheeler, Rory M Hope, Steven J B Cooper, Andrew A Gooley, and Robert A B Holland. Linkage of the  $\beta$ -like  $\omega$ -globin gene to  $\alpha$ -like globin genes in an australian marsupial supports the chromosome duplication model for separation of globin gene clusters. *J. Mol. Evol.*, 58(6):642–652, 2004. Journal IF=1.945.

David Wheeler, Rory Hope, Steven J B Cooper, Gaynor Dolman, Graham C Webb, Cynthia D K Bottema, Andrew A Gooley, Morris Goodman, and Robert A B Holland. An orphaned mammalian  $\beta$ -globin gene of ancient evolutionary origin. *Proceedings of the National Academy of Sciences*, 98(3):1101–1106, 2001. Journal IF=9.423.