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# Carsten Külheim

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## SUMMARY

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- 60 publications to date (47 peer-reviewed international journal articles), including a first-authored paper in *Science* and major contribution to a paper in *Nature*.
- Steep career trajectory as evident by my recent record of 32 publications in the past 5 years.
- An *h*-index of 21 and over 2,800 citations (google scholar) demonstrates my high level of exposure to the scientific community.
- Awarded over US\$1,500,000 in research funds, including funds from competitive national schemes and from the Industry sector.
- Scientific consultant to Industry and Government organisations.
- Diverse experience in a range of practical and theoretical areas of evolution, plant genetics, plant-microbial and other environmental interactions, biotechnology, metabolomics, plant physiology and molecular biology.

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## RESEARCH POSITIONS

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- 2018 – **Associate Professor at Michigan Technological University.**
- 2010 – 18 **Senior Research Fellow at the Australian National University.**
- 2008 – 09 **Research Fellow at the Australian National University.**
- 2006 – 08 **Postdoctoral Research Fellowship at University of British Columbia.**

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## EDUCATION

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- 2000 – 05 **Doctor of Philosophy** (Plant Molecular Biology) awarded October 2005  
Department of Plant Physiology, Umeå University, Sweden.  
Thesis: "The significance of feedback de-excitation".  
Supervisor: Prof Stefan Jansson
- 1999 – 00 **Bachelor of Science** (Biology) awarded June 2000  
Department of Plant Physiology, Umeå University, Sweden.  
Thesis: "Function and Regulation of the light harvesting like genes".  
Supervisor: Prof Stefan Jansson
- 1996 – 99 **"Vordiplom"** (Biology) awarded May 1999  
University of Mainz, Germany

## RESEARCH GRANTS

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\$435,500 awarded as PI

\$524,128 awarded as co-PI

\$595,000 awarded as co-writer

- 2021 – 23 DKK 3,000,000 (ca. \$476,000) **Novo Nordisk Foundation** (co-PI) ExCeed: Exploiting the Chemical Diversity of Trees (*pending*)
- 2021 – 24 \$497,752 **USDA-NIFA, AFRI Education and Workforce Development** (Key personnel) REEU Field Practicum in Sustainable Production Systems in Upper Great Lakes Forests (*pending*)
- 2020 – 23 \$190,394 **NSF CAREER Award** (Mentor) Can material costs contribute to the structuring of biodiversity patterns from genomes and transcriptomes to multispecies communities? (*awarded*)
- 2020 – 24 \$474,128 **USDA-NIFA, AFRI Foundational Program** (co-PI) Social implications of genetically improved trees: Assessing public and forest owner attitudes and risk perceptions (*awarded*)
- 2020 \$499,944 **US Department of Agriculture** (PI) Environmental and genetic influences on range-wide variation in physiology of sugar maple and northern red oak: carbon cycling implications (*pending*)
- 2020 \$33,000 **MTU Research Excellence Fund – Research Seed** (PI) Building essential red oak genomic resources for comparative genomics and as a basis for genome-wide association studies (*awarded*)
- 2019 – 22 **USDA AFRI FACT** (Advisory committee) Enabling Association Mapping And Landscape Genomics Through The Advanced Integration Of Genotype, Phenotype, And Geospatial Data (*awarded*)
- 2018 – 21 \$24,000 **USDA NIFA M-S grant** (PI) Thriving trees for future needs - oak adaptation to climate change (*awarded*)
- 2019 \$12,800 **Animal Welfare Institute** (co-PI) A noninvasive iDNA methodology to monitor wildlife to facilitate conservation (*unsuccessful*)
- 2018 \$499,854 **US Department of Agriculture** (co-PI) Social implications of genetically improved trees: Assessing public and forest owners attitudes and risk perception to inform forest genetics research (*unsuccessful*)
- 2018 \$199,936 **US Department of Agriculture** (co-PI) Environmental and genetic influences on latitudinal variation in tree physiology: implication for carbon cycling in a changing climate (*unsuccessful*)
- 2018 A\$807,364 (ca. US\$621,050) **Australian Research Council Future Fellowship** (PI) Jet fuel grows on eucalypt trees (*unsuccessful*)
- 2015 A\$774,891 (ca/ US\$596,000) **Australian Research Council Future Fellowship** (PI) Matching trees with future environments (*unsuccessful*)
- 2014 – 16 A\$460,000 (ca. US\$350,000) **Australian Research Council Discovery project** (co-writer) Re-evaluating the nature, origins and roles of terpenes in *Eucalyptus* (DP140101755) (*awarded*).
- 2013 – 15 A\$65,000 (ca. US\$50,000) **Hermon Slade Foundation** (co-PI) Mosaicism, somatic mutation, and environmental change in long-lived plants? (*awarded*)

2013	A\$772,000 (ca. US\$593,850) <b>Australian Research Council Future Fellowship</b> (PI) Harnessing the Eucalyptus genome to match trees to future environments ( <i>unsuccessful</i> )
2012	A\$5,000 (ca. US\$3,500) <b>ANU-CSIRO Centre for Biodiversity Analysis Ignition project</b> (PI) Did Australia's most diverse group of bees diversify in concert with the Eucalypts? ( <i>unsuccessful</i> )
2012 – 13	A\$5,000 (ca. US\$3,500) <b>ANU-CSIRO Centre for Biodiversity Analysis Ignition project</b> (PI) Deep sequencing of Eucalyptus series globulares to unravel its hybrid history ( <i>awarded</i> )
2012 – 14	A\$121,460 (ca. US\$90,000) <b>Plant Health Australia</b> (PI) Discovery of genetic markers for resistance to infection by <i>Uredo rangelii</i> in species of Myrtaceae (PHA-P214) ( <i>awarded</i> ).
2011	A\$1,292,731 (ca. US\$994,500) <b>Australian Research Council Discovery project</b> (co-writer) How to be a gum tree – genomic basis of functional traits in eucalypts ( <i>unsuccessful</i> ).
2011 – 15	A\$379,907 (ca. US\$285,000) <b>RIRDC</b> (co-PI) Discovery of genetic resistance markers to Myrtle rust in Myrtaceae (PRJ-007524) ( <i>awarded</i> ).
2011 – 13	A\$323,000 (ca. US\$245,000) <b>Australian Research Council Linkage Grant</b> (co-writer) Improvement of oil yield in essential oil producing Myrtaceae (LP110100184) ( <i>awarded</i> ).

## ADDITIONAL FUNDS TO SUPPORT RESEARCH AND STUDENTS

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2020	\$4,000 <b>MTU Summer Undergraduate Student Fellowship</b> supporting Ms. Stephanie Frantti
2020	\$4,000 <b>MTU Summer Undergraduate Student Fellowship</b> supporting Ms. Victoria Peck
2019	\$8,000 <b>Ecosystem Science Centre and SFRES Dean Storer</b> supporting infrastructure investments for red oak adaptation study at Kellogg Research Station
2019	\$700 <b>Superior Ideas</b> , Michigan Tech University crowd funding platform in support of red oak adaptation study
2018	\$1,000 <b>Ecosystem Science Centre graduate student grant</b> supporting Ms. Shallen Gurtler
2018	\$1,000 <b>Ecosystem Science Centre graduate student grant</b> supporting Mr. James Rauschendorfer

## SCHOLAR- AND FELLOWSHIPS, SCIENTIFIC AWARDS

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2016	Nominated for ANU Media and Outreach Award
2007	SEK 300,000 (ca. US\$35,000) <b>Swedish Research Council</b> Postdoctoral fellowship
2005	Young Scientist award at the conference: "Photosynthesis and Post Genome Era in honour to Norio Murata", Trois Riviers, Canada
2003	SEK 11,000 (ca. US\$1,300) <b>Kempe Foundation</b> travel grant for "ISPMB" conference in Barcelona, Spain
2002	SEK 50,000 (ca. US\$5,900) <b>Faculty of Science, Umeå University</b> 5 months lab experience with Prof Krishna Niyogi, University of California, Berkeley
2001	SEK 16,000 (ca. US\$1,900) <b>Wallenberg Foundation</b> travel grant for "Photosynthesis 2001" conference in Brisbane, Australia
1999 – 2000	DM 2,000 (ca. US\$1,100) <b>Erasmus</b> scholarship for international exchange year (Mainz – Umeå)

## TEACHING EXPERIENCE

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- 2020 – FW4128 – Conservation Genetics, Guest lecture, MTU
- 2019 – FW5340 – Population genetics and Applied Forest Genetics (graduate level course), Course convenor and principal instructor, MTU
- 2019 – FW3320 – Fundamentals in Forest Genetics and Genomics, Course convenor and principal instructor, MTU
- 2019 – FW1050 – Natural Resources Professional, Guest lecture, MTU
- 2012 – 16 Designed and presented 4 lectures and 1 practical on quantitative genetics in 3<sup>rd</sup> year undergraduate course “Bioinformatics and functional genomics”, ANU
- 2012 Developed curriculum for 3<sup>rd</sup> year undergraduate course “Bioinformatics and functional genomics”, ANU
- 2010 Designed and presented 3 lectures and 1 practical on experimental planning, execution and analysis of next-generation sequencing data in 3<sup>rd</sup> year undergraduate course “Tools for molecular ecology”, ANU
- 2003 – 04 Designed and presented 2 lectures on regulation of light harvesting in C-level (3<sup>rd</sup> year) undergraduate course “Plant Molecular Biology”, Umeå University
- 2004 (fall) Laboratory Assistant “Plant Physiology” C-level (3<sup>rd</sup> year) course, Umeå University
- 2004 (spring) Laboratory Assistant “Plant Physiology” B-level (2<sup>nd</sup> year) course, Umeå University
- 2003 (fall) Laboratory Demonstration “Abiotic plant Stress” graduate student course, Umeå University
- 2003 (fall) Laboratory Assistant “Plant Molecular Biology” C-level (3<sup>rd</sup> year) course, Umeå University
- 2003 (spring) Laboratory Assistant in three A-level (1<sup>st</sup> year) courses, Umeå University
- 2001 (fall) Laboratory Assistant “Plant Molecular Biology” C-level (3<sup>rd</sup> year) course, Umeå University
- 2001 (spring) Laboratory Assistant “Cell Biology” A/B-level (1<sup>st</sup> / 2<sup>nd</sup> year) course, Umeå University
- 2000 (fall) Laboratory Assistant “Plant Physiology” C-level (3<sup>rd</sup> year) course, Umeå University
- 2000 (fall) Laboratory Assistant “Plant Molecular Biology” C-level (3<sup>rd</sup> year) course, Umeå University
- 1999 (summer) Tutor in Zoology (1<sup>st</sup> year), University of Mainz

## STUDENT SUPERVISION - graduate

- Current*
- PhD student Rob Tunison, advisory committee (completion 2022)
  - PhD student Angela Walczyk, advisory committee (completion 2021)
  - PhD student James Rauschendorfer, supervisor (completion 2021)
  - PhD student Ryan Ghannam, advisory committee (completion 2021)
  - Master student Emily Lindback, co-supervisor (completion 2022)

### *Past*

- 2018 – 20 MS student Shallen Gurtler, supervisor “Monitoring mammal community shifts across silvicultural treatments utilizing camera traps and the development of iDNA in hardwood forests of North America”
- 2019 – 20 MS student Munkaila Musah, co-supervisor. MS by coursework
- 2019 – 20 PhD student Olufemi Ifeoluwa Afolami, advisory committee (Transferred)

- 2018 PhD student Alexander Apostle, supervisor Transferred
- 2014 – 18 PhD student Meredith Cosgrove, co-supervisor. “Biogeography of Myrtaceae”.
- 2014 – 18 PhD student Sarah Hsieh, supervisor. “Discovery of genetic resistance markers for Myrtle rust in Myrtaceae”.
- 2013 – 18 PhD student Bokyoung Choi, co-supervisor. “Phylogeny and biogeography of Melaleuceae”.
- 2014 – 17 PhD student Peri Tobias, co-supervisor. “Molecular Biology of plant defence against Myrtle rust”.
- 2014 – 17 PhD student David Kainer, supervisor. “Genomic selection for essential oil yield in eucalypts”.
- 2013 – 16 PhD student Carlos Bustos, co-supervisor. “Intraspecific variation in plant chemistry and implications for ecological interactions”.
- 2013 – 14 Masters student Erik Visser, co-supervisor. “Defence responses in *Pinus patula* to the fungal pathogen *Fusarium circinatum*”.
- 2010 – 15 PhD student Bee Gunn, co-supervisor. “Biogeography of coconuts”.
- 2010 – 15 PhD student Hamish Webb, supervisor. “The genetics of oil yield in *Melaleuca alternifolia* and *Eucalyptus loxophleba*”.
- 2010 – 13 PhD student Amanda Padovan, co-supervisor. “Mosaic eucalypts: Chemical variation and differential gene expression within a *Eucalyptus melliodora* and a *Eucalyptus sideroxylon* tree”.
- 2007 – 12 PhD student Suat Hui Yeoh, co-supervisor. “Population genetics and essential oil yield in *Eucalyptus globulus*”.

### STUDENT SUPERVISION - undergraduate

- 2020 Victoria Peck (spring, summer), Stephanie Frantti (spring, summer)
- 2019 Victoria Peck (spring-fall), Allie Johnson (summer) and Stephanie Frantti (summer-fall)
- 2009 – 14 Five Special Topics students (4 credit research projects)
- 2012 – 14 PhB student Helen Kennedy
- 2009 Honours student Hamish Webb, supervisor. “The genetic basis of quantitative variation in terpene traits in *Melaleuca alternifolia*”. Honours First class.
- 2009 German exchange student Samira Samtleben (9 months)
- 2008 German Diploma thesis Jens Maintz

### PUBLICATION LIST

#### 10 Career best publications

1. **Külheim C, Ågren J, Jansson S (2002)** Rapid Regulation of light harvesting and Plant fitness in the field. *Science* **297**: 91-93  
*Impact data: JIF: 31.48 Citations: 550*  
*Significance:* This study found that an *Arabidopsis* mutant unable to regulate photosynthesis had reduced fitness in the field, while performing equal to wild type under controlled conditions. I contributed to the design, conducted all experiments and co-wrote the first draft

2. Frenkel M, **Külheim C\***, Jankanpaa HJ, Skogstrom O, Dall'Ostro L, Agren J, Bassi R, Moritz T, Moen J, Jansson S (2009) Improper excess light dissipation in *Arabidopsis* results in metabolic reprogramming. ***BMC Plant Biology* 9: 12** (\*shared first author)  
*Impact data: JIF: 4.38*                      *Citations: 62*  
*Significance:* In this study we examined changes in global transcript, protein and metabolite abundance in Arabidopsis mutants unable to regulate light-harvesting. It sparked my interest in plant-herbivore interactions through field observations. I and SJ conceived the study; I performed about half the experiments, analysed data and wrote the first draft. I read, edited and approved the final manuscript.
3. **Külheim C**, Yeoh SH, Maintz J, Foley WJ, Moran GF (2009) Comparative SNP diversity among four Eucalyptus species for genes from secondary metabolism biosynthetic pathways. ***BMC Genomics* 10: 452**  
*Impact data: JIF: 4.4*                      *Citations: 101*  
*Significance:* The first study to investigate allelic variants in biosynthetic pathway genes of plant secondary metabolites in eucalypts. In four species we found a variant every 16 to 33 bp. I designed the study, contributed to experiments, did all of the analysis and wrote the first draft of the paper.
4. **Külheim C**, Yeoh SH, Wallis IR, Laffan S, Moran GF, Foley WJ (2011) The molecular basis of quantitative variation in foliar secondary metabolites in *Eucalyptus globulus*. ***New Phytologist* 191: 1041-1053**  
*Impact data: JIF: 7.43*                      *Citations: 85*  
*Significance:* Here we show which allelic variants associate with quantitative variation in plant secondary metabolites. Geographic distributions of allele frequencies can influence the ecosystem ('Genes to Ecosystem'). I conceived the study, performed experiments, analysed most of the data and wrote the first draft of the paper.
5. Padovan A, Lanfear R, Keszei A, Foley WJ, **Külheim C** (2013) Differences in gene expression within a striking phenotypic mosaic *Eucalyptus* tree that varies in susceptibility to herbivory. ***BMC Plant Biology* 13: 29**  
*Impact data: JIF: 4.38*                      *Citations: 39*  
*Significance:* Transcriptome analysis of a single tree with two ecotypes. This paper was the editors pick and has been accessed 5,942 times since publication. I conceived and designed the experiments. AP and I performed the experiments, analysed the data and wrote the first draft. I read, edited and approved the final manuscript.
6. Moore B, Andrew R, **Külheim C**, Foley WJ (2014) Explaining intraspecific diversity in plant secondary metabolites in an ecological context. ***New Phytologist* 201: 733-750**  
*Impact data: JIF: 7.43*                      *Citations: 250*  
*Significance:* Invited review that provides a synthesis on the evolution of plant secondary metabolite diversity. It spans a bridge from evolution to ecology. I wrote sections 'Genes and biosynthetic pathways underlying PSM variation', 'Mechanisms for diversification of PSMs' and 'Examples of Diversity from specific biosynthetic pathways'. I read, edited and approved the final manuscript.
7. Myburg AA, Grattapaglia D, Tuskan GA, ... , **Külheim C**, Foley WJ, ... , Van de Peer Y, Rokhsar DS, Schmutz J (2014) The genome of *Eucalyptus grandis*. ***Nature* 510: 356-362**  
*Impact data: JIF: 42.35*                      *Citations: 518*

*Significance:* Annotation and analysis of the *Eucalyptus* genome. I analysed genome data and annotated genes in plant secondary metabolism resulting in Figure 4 and section ‘secondary metabolites and oils’. I read, edited and approved the final manuscript.

8. **Külheim C**, Padovan A, Hefer C, Krause ST, Köllner TG, Myburg AA, Degenhardt J, Foley WJ (2015) The *Eucalyptus* terpene synthase gene family. *BMC genomics* **16**: 450

*Impact data:* JIF: 3.99                      Citations: 73

*Significance:* In depth analysis of the gene family that produces the diversity of terpenes in eucalypts. We discuss gene family evolution, genome organisation and gene expression. Project conception, data acquisition and analysis, figures, tables (with the exception of functional characterisation of genes) and text by me.

9. Bustos-Segura C, Padovan A, Kainer D, Foley WJ, **Külheim C** (2017) Transcriptome analysis of terpene chemotypes of *Melaleuca alternifolia* across different tissues. *Plant, Cell & Environment* DOI: 10.1111/pce.13048

*Impact data:* JIF: 6.17                      Citations: 5

*Significance:* Two tea tree chemotypes differed by only a handful of differentially expressed genes, all involved in the biosynthesis of the compounds that cause the chemotypical difference, while a third chemotype differed greatly in gene expression, which may be the result of recent interbreeding. I designed and co-ordinated the study and conducted the expression analysis and writing. All authors read and approved the final manuscript.

10. Kainer D, Padovan A, Degenhardt J, Krause S, Mondal P, Foley WJ, **Külheim C** (2019) High marker density GWAS provides novel insights into the genomic architecture of terpene oil yield in *Eucalyptus*. *New Phytologist* **223**: 1489-1504

*Impact data:* JIF: 7.43                      Citations: 3

*Significance:* The first whole-genome resequencing study in eucalypts leading to genome-wide association of genetic markers with variation in terpenes. I designed and co-ordinated the study, conducted and/or supervised workflow from the field to the final analysis. All authors read and approved the final manuscript.

## Peer-reviewed Journal Publications

- Orr AJ, Padovan A, Kainer D, **Külheim C**, Bromham L, Bustos-Segura C, Foley WJ, Haff T, Hsieh J-F, Morales-Suarez A, Cartwright RA, Lanfear R (2020) A phylogenomic approach reveals a low somatic mutation rate in a long-lived plant. *Proceeding of the Royal Society B* **287**: 20192364 [Journal Impact Factor: 4.85]
- Rauschendorfer J, Yordanov Y, Dobrev P, Vankova R, Sykes R, **Külheim C**, Busov V (2020) Overexpression of a developing xylem cDNA library in transgenic poplar generates high mutation rate specific to wood formation. *Plant Biotechnology Journal* **18**: 1434-1443 <https://doi.org/10.1111/pbi.13309> [Journal Impact Factor: 6.84]
- Marsh KJ, Wallis IR, **Külheim C**, Clark R, Nicolle D, Foley WJ, Salminen J-P (2020) New approaches to tannin analysis of leaves explain biological activity associated with herbivore defence. *New Phytologist* **225**: 488-498 <https://doi.org/10.1111/nph.16117> [Journal impact factor: 7.43; citations: 2]
- Choi B, Crisp MD, Cook LG, Edwards BD, Toon A, **Külheim C** (2019) Identifying genetic markers for a range of phylogenetic utility – from species to family level. *PLoS One* **14**: e0218995 [Journal impact factor: 3.53]

5. Kainer D, Padovan A, Degenhardt J, Krause S, Mondal P, Foley WJ, **Külheim C** (2019) High marker density GWAS provides novel insights into the genomic architecture of terpene oil yield in *Eucalyptus*. **New Phytologist** **223**: 1489-1504 [Journal impact factor: 7.43; citations: 3]
6. Thornhill AH, Crisp MD, **Külheim C**, Lam KE, Nelson LA, Yeates DK, Miller JT (2019) A dated molecular perspective of eucalypt taxonomy, evolution, and diversification. **Australian Systematic Botany** **32**: 29-48 [Journal impact factor: 0.65; citations: 9]
7. Kanagendran A, Pazouki L, Bichele R, **Külheim C**, Niinemets Ü (2018) Temporal regulation of terpene synthase gene expression in *Eucalyptus globulus* leaves upon ozone and wounding stresses: relationships with stomatal ozone uptake and emission responses. **Environmental and Experimental Botany** **155**: 552-565 [Journal impact factor: 3.67; citations: 7]
8. Kainer D, Stone E, Padovan A, Foley WJ, **Külheim C** (2018) High accuracy genomic prediction for foliar terpene traits in *Eucalyptus polybractea*. **G3 – Genes, Genomes, Genetics** **8**: 2573-2583 doi.org/10.1534/g3.118.200443 [Journal impact factor: 2.86; citations: 9]
9. Naidoo S, Christie N, Acosta JJ, Mphahlele M, Payn K, Myburg AA, **Külheim C** (2018) Terpenes associated with resistance against the gall wasp, *Leptocybe invasa*, in *Eucalyptus grandis*. **Plant, Cell & Environment** **41**: 1840-1851 [Journal impact factor: 6.17; citations: 4]
10. Hsieh J-F, Chuah A, Patel H, Sandhu K, Foley WJ, **Külheim C** (2018) Transcriptome profiling of resistant and susceptible *Melaleuca quinquenervia* reveals defense mechanisms against the exotic pathogen myrtle rust (*Austropuccinia psidii*). **Phytopathology**: **108**: 495-509 [Journal impact factor: 2.90; citations: 7]
11. Tobias PA, Guest DI, **Külheim C**, Park RF (2018) Identification of candidate genes involved in resistance to *Austropuccinia psidii* (myrtle rust) in *Syzygium luehmannii* (riberry). **Phytopathology**: **108**: 627-640 [Journal impact factor: 2.90; citations: 6]
12. Ranjard L, Wong TKF, **Külheim C**, Rodrigo AG, Ragg NLC, Dunphy BJ (2018) Complete mitochondrial genome of the green-lipped mussel, *Perna canaliculus* (Mollusca: Mytiloidea), from long nanopore sequencing reads. **Mitochondrial DNA Part B: Resources** **3**: 175-176 [citations: 6]
13. Padovan A, Keszei A, Hassan Y, Krause ST, Köllner TG, Degenhardt J, Gershenzon J, **Külheim C**, Foley WJ (2017) Four terpene synthases contribute to the generation of different chemotypes in tea tree (*Melaleuca alternifolia*). **BMC Plant Biology** **17**:160 [Journal impact factor: 4.38; citations: 6]
14. Bustos-Segura C, Padovan A, Kainer D, Foley WJ, **Külheim C** (2017) Transcriptome analysis of terpene chemotypes of *Melaleuca alternifolia* across different tissues. **Plant, Cell & Environment** DOI: 10.1111/pce.13048 [Journal impact factor: 6.17; citations: 5]
15. Padovan A, Webb H, Mazenek R, Grayling P, Foley WJ, **Külheim C** (2017) Association genetics of essential oil traits in *Eucalyptus loxophleba*: explaining variation in oil yield. **Molecular Breeding** **37**: 73 [Journal impact factor: 2.11; citations: 3]
16. Bustos-Segura C, Dillon S, Keszei A, Foley WJ, **Külheim C** (2017) Intraspecific diversity of terpenes of *Eucalyptus camaldulensis* at a continental scale. **Australian Journal of Botany** **65**: 257-269 [Journal impact factor: 1.87; citations: 11]
17. Tobias PA, Christie N, Naidoo S, **Külheim C** (2017) Identification of the *Eucalyptus grandis* chitinase gene family and expression characterization under different biotic stress challenges. **Tree Physiology** **37**: 565-582 [Journal impact factor: 3.66; citations: 11]
18. Kainer D, Bush D, Foley WJ, **Külheim C** (2017) Components of oil yield in a commercial plantation of *Eucalyptus polybractea* (blue malee). **Industrial Crops and Products** **102**: 32-44 [Journal impact factor: 3.45; citations: 8]
19. Marsh KJ, **Külheim C**, Thornhill AH, Miller JT, Wallis IR, Nicolle D, Sakminen J-P, Foley WJ (2017) Genus-wide variation in foliar polyphenolics in eucalypts: Phylogenetic constraints and evidence for selection



- on functional traits of tannins. *Phytochemistry* DOI:10.1016/j.phytochem.2017.09.014 [Journal impact factor: 3.21; citations: 11]
20. Mewalal R, Rai DK, Kainer D, Chen F, Külheim C, Peter GF, Tuskan GA (2017) Plant-derived terpenes: A feedstock for speciality biofuels. *Trends in Biotechnology* **35**: 227-240 [Journal impact factor: 12.0; citations: 59]
21. González-Orozco CE, Pollock LJ, Thornhill AH, Mishler BD, Knerr N, Laffan SW, Miller JT, Rosauer DF, Faith DP, Nipperess DA, Kujala H, Linke S, Butt N, Külheim C, Crisp MD, Gruber B (2016) Phylogenetic approaches reveal biodiversity threats under climate change. *Nature Climate Change* **6**: 1110-1114 [Journal impact factor: 17.2; citations: 80]
22. Tobias PA, Guest DI, Külheim C, Hsieh J-F, Park RF (2016) A curious case of resistance to a new encounter pathogen: myrtle rust in Australia. *Molecular Plant Pathology* **17**: 783-788 [Journal impact factor: 4.72; citations: 19]
23. Christie N, Tobias PA, Naidoo S, Külheim C (2015) The *Eucalyptus grandis* NBS-LRR gene family: Physical Clustering and Expression hotspots. *Frontiers in Plant Science* **6**: 1238 [Journal impact factor: 3.6; citations: 36]
24. Bustos-Segura C, Külheim C, Foley WJ (2015) Effects of terpene chemotypes of *Melaleuca alternifolia* on two specialist leaf beetles and susceptibility to myrtle rust. *Journal of Chemical Ecology* **41**: 937-947 [Journal impact factor: 2.75; citations: 12]
25. Kainer D, Lanfear R, Foley WJ, Külheim C (2015) Genomic approaches to selection in outcrossing perennials: Focus on essential oil crops. *Theoretical and Applied Genetics* DOI: 10.1007/s00122-015-2591-0 [Journal impact factor: 3.79; citations: 13]
26. Külheim C, Padovan A, Hefer C, Krause ST, Köllner TG, Myburg AA, Degenhardt J, Foley WJ (2015) The *Eucalyptus* terpene synthase gene family. *BMC Genomics* **16**: 450 [Journal impact factor: 3.99; citations: 73]
27. Padovan A, Patel HR, Chuah A, Huttley GA, Krause ST, Degenhardt J, Foley WJ, Külheim C (2015) Transcriptome sequencing of two phenotypic mosaic *Eucalyptus* trees reveals large scale transcriptome re-modelling. *PLoS One* **10**: e0123226 [Journal impact factor: 3.53; citations: 14]
28. Thornhill AH, Ho SYW, Külheim C, Crisp MD (2015) Interpreting the modern distribution of Myrtaceae using a dated molecular phylogeny. *Molecular Phylogenetics and Evolution* **93**: 29-43 [Journal impact factor: 3.92; citations: 91]
29. Tobias PA, Park RF, Külheim C, Guest DI (2015) Wild-sourced *Chamelaucium uncinatum* have no resistance to *Puccinia psidii* (myrtle rust). *Australasian Plant Disease Notes* **10**: 15 [Journal impact factor: NA; citations: 11]
30. Visser EA, Mangwanda R, Becker JW, Külheim C, Foley WJ, Myburg AA, Naidoo S (2015) Foliar terpenoid levels and corresponding gene expression are systemically and differentially induced in *Eucalyptus grandis* clonal genotypes in response to *Chrysosporthe austroafricana* challenge. *Plant Pathology* doi: 10.1111/ppa. 12368 [Journal impact factor: 2.12; citations: 2]
31. Oates CN, Külheim C, Myburg AA, Slippers B, Naidoo S (2015) The transcriptome and terpene profile of *Eucalyptus grandis* reveals mechanisms of defence against the insect pest *Leptocybe invasa*. *Plant and Cell Physiology* **56**: 1418-1428 [Journal impact factor: 4.93; citations: 29]
32. Naidoo S, Külheim C, Zwart L, Mangwanda R, Oates C, Visser E, Wilken FE, Mamni TB, Myburg AA (2014) Uncovering the defence response of *Eucalyptus* to pests and pathogens in the genomics age. *Tree Physiology* **34**: 931-943 [Journal impact factor: 3.66; citations: 23]
33. Myburg AA, Grattapaglia D, Tuskan GA, ... , Külheim C, Foley WJ, ... , Van de Peer Y, Rokhsar DS, Schmutz J (2014) The genome of *Eucalyptus grandis*. *Nature* **510**: 356-362 [Journal impact factor: 42.35; citations: 518]

34. Webb H, Foley WJ, **Külheim C** (2014) The genetic basis of foliar terpene yield: Implications for breeding and profitability of Australian essential oil crops. ***Plant Biotechnology*** **31**: 363-376 [Journal impact factor: 1.06; citations: 14]
35. **Külheim C**, Jones CG, Plummer JA, Ghisalberti EL, Barbour L, Bohlmann J (2014) Foliar application of methyl jasmonate does not increase terpenoid accumulation, but weakly elicits terpenoid pathway genes in sandalwood (*Santalum album* L.) seedlings. ***Plant Biotechnology*** **31**: 585-591 [Journal impact factor: 1.06; citations: 7]
36. Padovan A, Keszei A, **Külheim C**, Foley WJ (2014) The evolution of foliar terpene diversity in Myrtaceae. ***Phytochemistry Reviews*** **13**: 695-716 [Journal impact factor: 4.15; citations: 53].
37. Moore B, Andrew R, **Külheim C**, Foley WJ (2014) Explaining intraspecific diversity in plant secondary metabolites in an ecological context. ***New Phytologist*** **201**: 733-750 [Journal impact factor: 7.43; citations: 250]
38. Webb H, Lanfear R, Hamill J, Foley WJ, **Külheim C** (2013) The yield of essential oils in *Melaleuca alternifolia* (Myrtaceae) is regulated through transcript abundance of genes in the MEP pathway. ***PLoS One*** **8**(3): e60631 [Journal impact factor: 3.53; citations: 28]
39. Padovan A, Lanfear R, Keszei A, Foley WJ, **Külheim C** (2013) Differences in gene expression within a striking phenotypic mosaic *Eucalyptus* tree that varies in susceptibility to herbivory. ***BMC Plant Biology*** **13**: 29 [Journal impact factor: 3.96; citations: 39]
40. Grattapaglia D, Vaillancourt RE, Sheperd M, Thumma BR, Foley WJ, **Külheim C**, Potts BM, Myburg A (2012) Progress in Myrtaceae genomics: *Eucalyptus* as the pivotal genus. ***Tree Genetics and Genomes*** **8**: 463-508 [Journal impact factor: 2.4; citations: 186]
41. **Külheim C**, Yeoh SH, Wallis IR, Laffan S, Moran GF, Foley WJ (2011) The molecular basis of quantitative variation in foliar secondary metabolites in *Eucalyptus globulus*. ***New Phytologist*** **191**: 1041-1053 [Journal impact factor: 7.43; citations: 85]
42. **Külheim C**, Yeoh SH, Maintz J, Foley WJ, Moran GF (2009) Comparative SNP diversity among four *Eucalyptus* species for genes from secondary metabolism biosynthetic pathways. ***BMC Genomics*** **10**: 452 [Journal impact factor: 3.99; citations: 101]
43. Philippe RN, Ralph SG, **Külheim C**, Jancsik SI, Bohlmann J (2009) Poplar defense against insects: genome analysis, full-length cDNA cloning and transcriptome and protein analysis of the poplar Kunitz-type protease inhibitor family. ***New Phytologist*** **184**: 865-884 [Journal impact factor: 7.43; citations: 43]
44. Frenkel M, **Külheim C**<sup>1</sup>, Jankanpaa HJ, Skogstrom O, Dall'Ostro L, Agren J, Bassi R, Moritz T, Moen J, Jansson S (2009) Improper excess light dissipation in Arabidopsis results in metabolic reprogramming. ***BMC Plant Biology*** **9** 12 [Journal impact factor: 3.96; citations: 62] (<sup>1</sup>: shared first author)
45. **Külheim C**, Jansson S (2005) What leads to reduced fitness in non-photochemical quenching mutants? ***Physiologia Plantarum*** **125**: 202-211 [Journal impact factor: 3.14; citations: 30]
46. Ganeteg U, **Külheim C**<sup>1</sup>, Andersson J, Jansson S (2004) Is each light-harvesting complex protein important for plant fitness? ***Plant Physiology*** **134**: 502-509 [Journal impact factor: 8.03; citations: 88] (<sup>1</sup>: shared first author)
47. **Külheim C**, Ågren J, Jansson S (2002) Rapid regulation of light harvesting and plant fitness in the field. ***Science*** **297**: 91-93 [Journal impact factor: 31.48; citations: 550]

### Refereed conference papers

48. Tobias P, Guest D, **Külheim C**, Park RF (2017) Identification of genes involved in resistance to *Austropuccinia psidii* (myrtle rust) in *Syzygium luehmannii* (Riberry). ***Science Protecting Plant Health***

49. Kainer D, Lanfear R, Penalba JV, Foley W, **Külheim C** (2016) Targeted repeat reduction in whole tree genomes prior to sequencing. **Proceedings of the IUFRO Tree Biotechnology 2015 Conference S3:O15**
50. Gunn B, **Külheim C**, Crisp M, Peakall R, Prebble M, Baudouin L, Olsen KM, Miller J (2012) Genomic studies of the coconut (*Cocos nucifera* L.). **Plant and Animal Genome Conference. 20:P0225**
51. **Külheim C**, Webb H, Yeoh SH, Wallis IR, Moran GF, Foley WJ (2011) Using the *Eucalyptus* genome to understand the evolution of plant secondary metabolites in the Myrtaceae. **BMC Proceedings 5:O11**
52. Webb H, **Külheim C**, Lanfear R, Hamill J, Foley WJ (2011) The regulation of quantitative variation of foliar terpenes in medicinal tea tree *Melaleuca alternifolia*. **BMC Proceedings 5:O20**
53. Foley WJ, Moran GF, Keszei A, **Külheim C** (2009) Chemicogenomics of plants. **Integrative and Comparative Biology 49: E57**
54. Jansson S, Andersson J, Ganeteg U, Klimmek F, **Külheim C**, Boekema E, Dekker J, Horton P, Agren J (2004) **Cellular and Molecular Biology Letters 9: 34**

### Other publications:

55. Kainer D, **Külheim C** (2016) Renewable jet fuel could be growing on Australia's iconic gum trees. **The Conversation** (<https://theconversation.com/renewable-jet-fuel-could-be-growing-on-australias-iconic-gum-trees-59377>)
56. **Külheim C**, Hsieh S, Tobias P, Foley WJ (2015) Discovery of genetic resistance markers to Myrtle rust in Myrtaceae. **RIRDC** (RIRDC report)
57. Webb H, Padovan A, **Külheim C**, Foley WJ (2013) Genetic markers for yield improvement in tea tree **RIRDC** (RIRDC report)
58. Webb H, Padovan A, **Külheim C**, Foley WJ (2013) Application of molecular genetics to improvement of yield in oil mallees. **RIRDC** (RIRDC report)
59. **Külheim C** (2010) Applying second-generation sequencing to non-model species. **Australian Biochemist 41: 10-13** (invited non-peer reviewed review paper)
60. Keszei A, Webb H, **Külheim C**, Foley WJ (2010) Genetic tools for improving tea tree oils **RIRDC 10-189** (RIRDC report)

### Submitted Manuscripts (available upon request):

61. Padovan A, Webb H, Wright LP, Baker G, Foley WJ, **Külheim C** – Association genetics of essential oil traits in *Melaleuca alternifolia*: explaining variation in foliar terpene concentration. Submitted
62. Li T, Kainer D, Foley WJ, Rodrigo AG, **Külheim C** – The draft genome sequence of *Eucalyptus polybractea* based on hybrid assembly with Oxford Nanopore and Illumina reads. Submitted

### CONFERENCE AND INVITED PRESENTATIONS (PRESENTER IN BOLD)

1. **Külheim C**. The genomic architecture of oil yield in Eucalyptus. National Renewable Energy Laboratory, Golden CO, July 2019
2. **Külheim C**. Genes to Ecosystems: The problem of complex traits. Oak Ridge National Laboratories, Oak Ridge TN, July 2019
3. **Külheim C**. The genomic architecture of oil yield in Eucalyptus. IUFRO Tree Biotechnology bi-annual conference, Raleigh, NC; June 2019
4. **Külheim C**. Genes to Ecosystems: The problem of complex traits. University of Minnesota, Duluth, Department of Biology seminar; April 2019

5. **Külheim C.** Genes to Ecosystems: The problem of complex traits. Michigan State University, Biochemistry and Molecular Biology; November 2018
6. **Külheim C.** Genes to Ecosystems: The problem of complex traits. Michigan Technological University, Department of Biology; November 2018
7. **Tobias P**, Jones B, Guest D, Park R, Külheim C. Molecular markers for resistance to myrtle rust in Australian Myrtaceae. Queenstown Molecular Biology Meeting; August 2018
8. **Külheim C.** Genes to Ecosystems: The problem of complex traits. University of Copenhagen, Department of Plant Biochemistry; June 2018
9. **Külheim C.** Genes to Ecosystems: The problem of complex traits. University of New England, School of Environmental and Rural Science; April 2018
10. **Külheim C.** Genes to Ecosystems: The problem of complex traits. Michigan Technological University, School of Forest Resources and Environmental Science; February 2018
11. **Külheim C.** How genomics may transform forestry and conservation. Michigan Technological University, School of Forest Resources and Environmental Science; February 2018
12. **Külheim C**, Tobias P, Hsieh J-F. Myrtle rust resistance in Australian species – Studies in progress. Myrtle Rust Environmental Impacts Workshop. Canberra, Australia; December 2017
13. **Külheim C.** Genes to Ecosystems: The problem of complex traits. Macquarie University, Department of Biology, Sydney, Australia; November 2017
14. **Külheim C.** Terpene variation in the world's major hardwood plantation tree: Genomics, health and applications to biofuels. North Carolina State University, Forestry and Environmental Resources; August 2017
15. **Foley W**, Külheim C, Kainer D, Hsieh J-F, Padovan A, Krause S, Degenhardt J. Genomics of variation in yield of terpenes from Australian Myrtaceae. The 13<sup>th</sup> International Meeting on Biosynthesis, Function and Synthetic Biology of Isoprenoids. Dalian, China; July 2017
16. **Külheim C.** Terpene variation in the worlds major hardwood plantation tree: Genomics and applications to biofuels. Northern Arizona University, School of Forestry; April 2017
17. **Külheim C.** How genomics may transform forestry and conservation. Northern Arizona University, School of Forestry; April 2017
18. **Hsieh J-F**, Chuah A, Patel H, Sandhu K, Foley WJ, Külheim C. Transcriptome Profiling of Broad-leaf Paperbark (*Melaleuca quinquenervia*) challenged by Myrtle Rust (*Puccinia psidii*) Revealed Variation in Defence Responses among Resistant Individuals. National Myrtle Rust Symposium, Brisbane, Australia; March 2017
19. **Foley W**, Strauss S, Yantchuk A, Attard G, Külheim C. Opportunities and Constraints on Biotechnology in Forest Trees for Combating Pests and Disease. Beijing Forestry University, Beijing, China; March 2017
20. **Külheim C.** Transcriptome sequencing of resistant individuals from two species of Myrtaceae reveal varying resistance mechanisms to Myrtle rust. University of Florida, Plant Pathology; February 2017
21. **Külheim C.** Genome-wide associations with essential oil yield in blue mallee. University of Florida, School of Forest Resources and Conservation; February 2017
22. **Külheim C.** Transcriptome sequencing of resistant individuals from two species of Myrtaceae reveal varying resistance mechanisms to Myrtle rust. North Carolina State University, Forestry and Environmental Resources; February 2017
23. **Külheim C.** From genes to Ecosystems – How variants affect Pest and Pathogen defence in Trees. State University of New York, College of Environmental Science and Forestry; February 2017
24. **Külheim C.** Evolutionary and Population genetics. State University of New York, College of Environmental Science and Forestry; February 2017

25. **Külheim C.** Genome-wide associations with essential oil yield in blue mallee. University of Connecticut, Department of Ecology and Evolutionary Biology; February 2017
26. **Külheim C.** Transcriptome sequencing of resistant individuals from two species of Myrtaceae reveal varying resistance mechanisms to Myrtle rust. Northern Arizona University, Department of Biological Sciences; January 2017
27. **Külheim C.** Transcriptome sequencing of resistant individuals from two species of Myrtaceae reveal varying resistance mechanisms to Myrtle rust. Oregon State University, Botany and Plant Pathology; January 2017
28. **Külheim C.** Genome-wide associations with essential oil yield in blue mallee. Oregon State University, Forest Engineering, Resources & Management; January 2017
29. **Kainer D**, Padovan A, Foley WJ, Külheim C. Genome-wide association of essential oil traits in *Eucalyptus polybractea* using a low-depth WGS pipeline. Plant & Animal Genome XX, San Diego, CA, USA; January 2017
30. **Külheim C.** High Energy Biofuels derived from *Eucalyptus* oil. ANU Energy Change Institute Open Day. Canberra, Australia; November 2016
31. **Külheim C.** Genome-wide associations with essential oil yield in blue mallee. Joint South African Society of Bioinformatics and South African Genetics Society Annual Conference, Durban, South Africa; September 2016
32. **Külheim C.** Plant pathogen recognition – Myrtle rust as a case study. University of Pretoria, Forestry and Agricultural Biotechnology Institute, Pretoria, South Africa; September 2016
33. **Külheim C.** Eucalyptus: Australia's resource for the future. ANU-RSB Public Forum, Canberra, Australia; August 2016
34. **Külheim C.** Harnessing genetic resources to enhance unimproved crops. ANU- Industry Relations discussion. Canberra, Australia; April 2016
35. **Külheim C.** Chemical and transcriptome analysis of resistant and susceptible *Eucalyptus* genotypes to the insect pest *Leptocybe invasa*. ANU-RSB Early-Mid Career Researcher Conference. Canberra, Australia; February 2016
36. **Külheim C**, Kainer D, Foley WJ. Terpene biosynthesis in Myrtaceae. US DOE Biofuel Roundtable discussion. ORNL, Oak Ridge TN, USA; October 2015
37. Külheim C, **Kainer D**, Foley W, Padovan A, Lanfear R, Bustos-Segura C. Terpenes... to turbojets. RSB HDR conference 2015; Australian National University, Canberra, Australia. August 18, 2015
38. **Külheim C.**, 1003 *Eucalyptus* genomes. Australian National University, Canberra, Australia; August 4, 2015
39. **Külheim C**, Oates C, Naidoo S. Chemical and transcriptome analysis of resistant and susceptible *Eucalyptus* genotypes to the insect pest *Leptocybe invasa*. International Society of Chemical Ecology, Stockholm, Sweden. June 29, 2015 - July 3, 2015
40. **Külheim C**, Molecular basis of resistance to myrtle rust (*Puccinia psidii*) in *Melaleuca quinquenervia*. 2015 IUFRO Tree Biotechnology Conference, Florence, Italy; June 8, 2015 - June 12, 2015
41. **Külheim C**, Plant pathogen recognition - Myrtle rust as a case study. Australian National University, Canberra, Australia. May 13, 2015
42. **Külheim C**, Genetic control of quantitative and qualitative variation of plant secondary metabolites in Australian Myrtaceae. Forestry and Agricultural Biotechnology Institute PhD student conference FABI, Pretoria, South Africa; October 18, 2014
43. Külheim C, **Hsieh J-F\***, Foley W, Discovering the molecular basis of resistance in Australian Myrtaceae to exotic fungal pathogen Myrtle rust (*Puccinia psidii*). 2014 AGTA annual conference, AGTA/AMATA, Melbourne, Australia; October 12 – October 15 2014 \*received price for student presentation

44. **Külheim C**, Genetic control of quantitative and qualitative variation of plant secondary metabolites in Australian Myrtaceae. University of Canberra, Canberra, Australia. March 27, 2014
45. **Külheim C**, Genetic tools for improvement of tea tree plants. ATTIA annual meeting, Lismore, Australia. February 19, 2014
46. **Külheim C**, Genetic resistance markers for breeding purposes. Native Food Industries Conference, RIRDC, Lismore, Australia; February 18, 2014
47. **Külheim C**, Genetic control of quantitative and qualitative variation of plant secondary metabolites in Australian Myrtaceae. Deep impact of Plant Metabolism; Going beyond diversity, Nara, Japan; November 17, 2013 - November 18, 2013
48. **Külheim C**, Comparative association genetics: finding the genetic control for terpene yield in Australian Myrtaceae. Deep impact of plant metabolism; Going beyond diversity Nara, Japan; November 16, 2013 - November 17, 2013
49. **Külheim C**, Myrtle rust resistance in tea tree. ATTIA Field Day, Casino, Australia; October 27, 2013
50. **Külheim C**, Tea tree genetics for oil yield and myrtle rust. ATTIA Field Day, Casino, Australia; October 27, 2013
51. **Külheim C**, Genetic control of quantitative and qualitative variation of plant secondary metabolites in Australian Myrtaceae. Australian National University, Canberra, Australia; October 17, 2013
52. **Külheim C**, Genetic control of quantitative and qualitative variation of plant secondary metabolites in Australian Myrtaceae. AGTA Annual conference; AMATA/AGTA, Gold Coast, Australia; October 13, 2013 - October 16, 2013
53. **Külheim C**, Discovery and comparison of genetic resistance markers in multiple Myrtaceae. Annual Myrtle rust conference, Australian Government, Sydney, Australia. July 25, 2013
54. **Külheim C**, Foley W, Padovan A, Webb H, , "Comparative association genetics: finding the genetic control for terpene yield in Australian Myrtaceae," IUFRO Tree Biotech Conference, Asheville, USA; June 26, 2013 - July 1, 2013
55. **Külheim C**, Eucalypts: genes to ecosystems; small genetic changes that shape the Australian landscape. Center for Biodiversity Australia first annual conference, CBA, Canberra, Australia; April 2, 2013
56. **Külheim C**, Population (to genus) phylogenomics. Australian National University, Canberra, Australia; December 2, 2012
57. **Külheim C**, From genes to environment: small genetic changes that shape the Australian landscape. University of Queensland, Brisbane, Australia; June 15, 2012
58. **Külheim C**, Population and Landscape genomics of Eucalyptus globulus. Australian National University, Canberra, Australia; June 1, 2012
59. **Külheim C**, Discovery and comparison of genetic resistance markers in multiple Myrtaceae. Annual Myrtle rust conference Australian Government, Brisbane, Australia; May 12, 2012
60. **Külheim C**, Population and Landscape genomics of Eucalyptus globulus. Australian National University, Canberra, Australia; May 3, 2012
61. **Külheim C**, Genomics of essential oil biosynthesis in Myrtaceae. Southern Cross University, Lismore, Australia; November 18, 2011
62. **Külheim C**, **Padovan A**, Foley W, Keszei A, Wallis I, Terpene variation in mosaic Eucalyptus. AMATA Annual Conference, AMATA/AGTA, Canberra, Australia; October 9, 2011 - October 12, 2011
63. **Külheim C**, Foley W, Wallis I, Keszei A, Webb H, Padovan A, Moran G, Using the Eucalyptus genome to understand the evolution of plant secondary metabolites in Myrtaceae. AMATA Annual Conference, AMATA/AGTA, Canberra, Australia; October 9, 2011 - October 12, 2011
64. **Külheim C**, **Foley W**, Padovan A, Webb H, Hammill J, How chemical and genetic variation in trees influences reproductive success in leaf eating marsupials. COMBIO 2011, COMBIO, Cairns, Australia; September 25, 2011 - September 29, 2011

65. **Külheim C**, Webb H, Wallis I, Moran G, Foley W. Using the Eucalypt genome for understanding the evolution of plant secondary metabolites in the Myrtaceae. International Botanical Congress, IBC, Melbourne, Australia; July 23, 2011 - July 30, 2011
66. **Külheim C**, Webb H, Yeoh S-H, Wallis I, Moran G, Foley W, Using the Eucalyptus genome to understand the evolution of plant secondary metabolites in Myrtaceae. IUFRO Tree Biotech Conference, IUFRO, Arraial d'Ajuda, Brazil; June 26, 2011 - July 2, 2011
67. **Külheim C**, Next-generation sequencing analysis for dummies. Australian National University, Canberra, Australia; June 5, 2011
68. **Külheim C**, The genetic basis of variation in foliar plant secondary metabolites in Australian Myrtaceae. Australian National University, Canberra, Australia; May 31, 2011
69. **Külheim C**, Research presentation Overview projects. Australian National University, Canberra, Australia; June 9, 2010
70. **Külheim C**, Combining next-generation high throughput sequencing and population genomics in Australian Myrtaceae. AMATA annual conference, AMATA/AGTA, Katoomba, Australia; October 18, 2009 - October 21, 2009
71. **Külheim C**, Gene and SNP discovery of two secondary metabolism pathways from four Eucalypt species utilizing Next-generation large scale sequencing. Australian National University, Canberra, Australia; December 8, 2008
72. **Külheim C**, Early defense responses to caterpillars in poplar. Forest Tree Molecular Biology and Genomics workshop, ISPMB, Adelaide, Australia; August 20, 2006 - August 25, 2006
73. **Külheim C**, The significance of feedback de-excitation. Australian National University, Canberra, Australia; August 16, 2006
74. **Külheim C**, The significance of feedback de-excitation. University of British Columbia, Vancouver, Canada; December 15, 2005
75. **Külheim C**, The significance of feedback de-excitation. York University, Toronto, Canada. December 13, 2005
76. **Külheim C**, The significance of feedback de-excitation. University of Western Ontario, Canada; December 12, 2005
77. **Külheim C**, Poplar mutants lacking PsbS. IUFRO Tree Biotech Conference, IUFRO, Pretoria, South Africa; December 2, 2005 - December 7, 2005
78. **Külheim C**, Reduced fitness due to impaired light harvesting. 7th Nordic Photosynthesis Congress Turku, Finland; November 6, 2004 - November 9, 2004
79. **Külheim C**, Light-harvesting mutants and fitness in the field. 2nd SPPS PhD student conference, Scandinavian Plant Physiology Society, Turku, Finland; August 5, 2002 - August 8, 2002

#### POSTER PRESENTATIONS (PRESENTER IN BOLD)

1. **Gurtler S**, Külheim C, Brzeski K, Developing multiple Invertebrate iDNA methodology in the Keweenaw Peninsula, Michigan to monitor Mammal Communities. The Wildlife Society Annual Conference, Reno, NV; September 29 – October 3, 2019
2. Külheim C, **Kainer D**, Foley W, Towards Genomic selection for essential oil yield in Eucalyptus and Melaleuca. AGTA annual conference, AMATA/AGTA, Melbourne, Australia; October 12 – October 15, 2014
3. Külheim C, **Kainer D\***, Foley W, A bioinformatics pipeline for SNP calling in next generation genotyping-by-sequencing. AMATA Annual conference, AMATA/AGTA, Gold Coast, Australia; October 13 – October 16, 2013 \*student received price for best poster
4. Külheim C, **Padovan A**, Foley W, The value of transcriptomic approaches in terpenoid research. Gordon Plant Volatile Conference, Ventura, CA, USA; January 24, 2012 - January 27, 2012

5. Külheim C, **Webb H**, Lanfear R, Hamill J, Foley W, The yield of essential oils in *Melaleuca alternifolia* (Myrtaceae) is regulated through transcript abundance of genes in the methylerythritol phosphate pathway. AMATA Annual Conference, AMATA/AGTA, Canberra, Australia; October 9, 2011 - October 12, 2011
6. Külheim C, **Webb H**, Lanfear R, Hamill J, Foley W, The expression of genes within the MEP pathway explains variation in both mono- and sesquiterpenes in *Melaleuca alternifolia*. Terpnets 2011: 10th International Meeting - Biosynthesis and function of isoprenoids in plants, microorganisms and parasites, Terpnets, Kalmar, Sweden; June 12, 2011 - June 17, 2011
7. **Külheim C**, Light-harvesting mutants and fitness in the field. XIIIth International Congress on Photosynthesis Montreal, Canada; August 10, 2004 - August 15, 2004
8. **Külheim C**, Light-harvesting mutants and fitness in the field. Photosynthesis and the post-genomic era, Trois-Riviere, Canada; August 3, 2004 - August 7, 2004
9. **Külheim C**, Fitness effects of mutants deficient in light-harvesting regulation. 29th FEBS Congress, FEBS, Warsaw, Poland; June 19, 2004 - June 24, 2004
10. **Külheim C**, Regulation of light-harvesting in the field. FEBS Forum for Young Scientists, FEBS, Warsaw, Poland; June 15, 2004 - June 18, 2004
11. **Külheim C**, Fitness effects of mutants deficient in light-harvesting regulation. 7th International Congress on Plant Molecular Biology Barcelona, Spain; June 15, 2003 - June 20, 2003
12. **Külheim C**, Fitness of npq4 mutants in the field. XIIth International Congress on Photosynthesis, Brisbane, Australia; August 3, 2001 - August 8, 2001
13. **Külheim C**, Jansson S, Expression of Early light inducible proteins under varying light. SPPS PhD student Conference, Scandinavian Plant Physiology Society, Tanum Strand, Sweden; August 20, 2000 - August 23, 2000

## CONFERENCE, SOCIETIES AND WORKSHOP RESPONSIBILITIES

2021	<b>Organizing committee</b> of the 2021 bi-annual conference IUFRO Tree Biotechnology to be held in Harbin, China
2019 –	<b>Deputy coordinator</b> IUFRO working party 2.04.06
2015	<b>Convenor</b> of Australasian Genomic Technologies Association annual conference, Hunter Valley, Australia
2013 – 17	<b>Vice President</b> of the Australasian Genomic Technologies Association (AGTA)
2013	<b>Presenter</b> at next generation sequencing workshop of the ANU-CSIRO Centre for Biodiversity
2013	<b>Presented</b> postgraduate ‘scientific writing’ workshop at Australian National University
2013	<b>Organizing committee</b> of Australasian Microarray and Associated Technologies Association annual conference, Gold Coast, Australia
2012	<b>Presenter</b> at Bioinformatics workshop at Australian National University
2011	<b>Convenor</b> of Australasian Microarray and Associated Technologies Association annual conference, Canberra, Australia
2010 –	<b>Member of the executive Board</b> of the Australasian Genomic Technologies Association (AGTA) former Australasian Microarray and Associated Technologies Association (AMATA)



## EDITORIAL EXPERIENCE

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- 2018 - Associate Editor of Tree Genetics and Genomes
- 2018 - Review Editor of Frontiers in Plant Science
- 2013 - Member of the Editorial Board of *AIMS Genetics*

## REVIEWING EXPERIENCE

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Reviewed over 100 articles for more than 20 journals in the last 5 years, including:

<i>New Phytologist</i>	<i>Nature Climate Change</i>	<i>Genetics</i>
<i>BMC Genomics</i>	<i>BMC Plant Biology</i>	<i>BMC Mol Biol</i>
<i>Mol Biology and Evolution</i>	<i>Mol Ecology</i>	<i>Int Journal of Biological Science</i>
<i>PLoS One</i>	<i>Tree Genetics and Genomes</i>	<i>Mol Phylogenetics and Evolution</i>

Reviewed grant applications for National Research Foundation of South Africa

Reviewed grant applications for National Natural Environmental Research Council (NERC), UK

Reviewed grant applications for the Binational Agricultural Research and Development Fund US-Israel

Reviewed internal MTU REF-RS grant proposals (2019)

Reviewed USDA-NIFA grants (2019)

## ACADEMIC AND INDUSTRY SERVICE

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- 2020 Planning, organization and execution of COVID-19 testing facility at MTU including supervision and training.
- 2019 – '20 Member of the MTU CFRES hiring committee for remote sensing faculty position
- 2019 – Member of the MTU Global and Community Engagement Group - IDEA Hub
- 2019 – Chair of the CFRES Diversity committee
- 2018 External member of the Australian National University John Curtin School of Medical Research hiring committee (3 technicians, 2.6 FTE)
- 2015 Member of the Genomic and Bioinformatics Planning Group, Australian National University
- 2013 – '18 Member of the Tea Tree Breeding Committee (RIRDC)
- 2001 – '05 Member of the Board of the Department of Plant Physiology, Umeå University, Sweden

## SCIENTIFIC CONSULTANCY

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- 2015 Consultant for the US Department of Energy production of biofuels from eucalypts
- 2011 – '18 Consultant to the Australian Tea Tree Industry Association (ATTIA) tea tree breeding programme

2009 – '18      Consultant to researchers from ANU, University of Canberra and CSIRO on design of next-generation sequencing experiments, methodology of preparing samples for next-generation sequencing and analysis of next-generation sequencing data.

## **PUBLIC OUTREACH AND COMMUNITY SERVICE**

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Interaction with essential oil producers (eucalyptus and tea tree oil) on how genomic methods may aid the improvement of their crops.

Interaction with essential oil producers, Native food Industries, Cut-flower Industries and nurseries on Myrtle rust.

## **MEDIA COVERAGE AND EXPERIENCE**

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- 2020      **Television interview:** TV6 <https://www.uppermichiganssource.com/2020/09/25/opening-week-of-autumn-delivers-peek-time-for-peak-fall-colors/>
- 2020      **Radio interview:** Radio Michigan (NPR) <https://www.michiganradio.org/post/how-michigan-tech-brought-covid-testing-upper-peninsula>
- 2017      **Radio interview:** ABC National
- 2016      **Radio interviews:** ABC Canberra, ABC National
- 2014      **Radio interviews:** ABC Canberra, ABC Rural, ABC National
- Newspaper and popular magazines;** over 30 articles, including:  
ABC Science, The Scientist, Science Daily, Science World Report, Zeit Online, Sci-News, Neue Züricher Zeitung, The Australian, Nature World News, Spiegel Online and Sky News.
- 2013      **Television Scope,** Channel 10, Australia