



CURRICULUM VITAE

Sharon Melissa Reynolds

MSC GENETICS

CONTACT:

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📍 Pretoria, South Africa

AREAS OF EXPERTISE:

Microsatellites
(Data Generation & Analysis)

SNPs
(Data Generation & Analysis)

Project Management

Verbal and Written Communication

Laboratory Management

SOFTWARE PROFICIENCY:

- Microsoft Office
- GeneMarker v1.95
- PowerMarker v3.25
- CERVUS v3.0.7
- STRUCTURE v2.3.3
- GenomeStudio v1.6.3
- Monday.com
- JoinMap v4.1
- MapChart v2.2
- MEGA v5.0
- ELabJournal
- Golden Helix SNP and Variation Suite v7
- Axiom Analysis Suite v5.1.1.1
- Colony v2.0.6.1
- PeopleSoft Financial Services Management
- R Programming Language

SUMMARY:

My two greatest passions are growing and mentoring people, and finding innovative solutions to a diverse range of problems. I love working in an academic environment where there is continuous exposure to new and exciting things, and many opportunities for development. I like to be challenged and tend to pursue opportunities for continued personal and professional growth. I genuinely care for the people I work with and love contributing to their success. I have been described by my colleagues as approachable, reliable, self-sufficient and resourceful.

In my current position, I have had the benefit of gaining insight into the operational aspects of the forestry industry and play the role of liaison between breeders within South African forestry companies and the Forest Molecular Genetics Programme(FMG), in addition to my responsibilities within FMG.

WORK EXPERIENCE:

PRECISION TREE BREEDING PLATFORM MANAGER

Forest Molecular Genetics Programme (University of Pretoria)
August 2012 - Present

- Operational management of the Precision Tree Breeding Platform consisting of six technical staff members
- Microsatellite and SNP marker data analysis, interpretation and reporting (written and verbal)
- Development and application of new DNA marker technologies, resources and standard operating procedures
- Funding applications and reports
- Training of technical staff and students
- Project co-ordination
- Financial oversight (quotations and invoicing)
- Liaising with platform users and academic collaborators

RESEARCH ASSISTANT

Forest Molecular Genetics Programme (University of Pretoria)
February 2008 - July 2012

- Sample preparation for DNA isolation
- High-throughput DNA isolations
- Microsatellite data generation (multiplex PCR)
- SNP genotyping (Illumina)
- Primary and secondary analysis of microsatellite and SNP data
- Data interpretation and reporting (written and verbal)
- Laboratory management
- Training junior technicians and students in standard operating procedures
- Establishing new standard operating procedures

ACADEMIC BACKGROUND:

MSC GENETICS (2017)

University of Pretoria

"SNP-based genetic linkage mapping and whole-genome diversity assessment in Cassava (*Manihot esculenta Crantz*) accessions from Africa and Latin America"

BSC HONS GENETICS (2007)

University of Pretoria

BSC HUMAN GENETICS (2006)

University of Pretoria

ADDITIONAL COURSES:

SNP GENOTYPING USING ILLUMINA GOLDEN GATE TECHNOLOGY

Presented by: Whitehead Scientific
Pretoria
2009 (1 week)

INTRODUCTORY MICROSATELLITE WORKSHOP

Presented by: University of Pretoria Sequencing Facility/Department of Genetics
Pretoria
2010 (1 week)

ADVANCED PHYLOGENETICS WORKSHOP

Presented by: University of Pretoria (Forestry and Agricultural Biotechnology Institute)
Pretoria
2011 (1 week)

AN INTRODUCTION TO MODERN TREE BREEDING

Presented by: Creation Breeding Innovations
Pretoria
2015 (1 week)

R BASICS, QUANTITATIVE GENETICS & GENOMIC SELECTION WORKSHOP

Presented by: Dr Fikrit Isik and Dr JJ Acosta
Pietermaritzburg
2016 (1 week)

AWARDS & MEMBERSHIPS:

Significant contribution of a staff member to the operations of the Forest Molecular Genetics Programme
2018 (Winner)

Golden Key International Honour Society

Membership number: 16578896
2018 - present

Significant contribution of a staff member to the operations of the Forest Molecular Genetics Programme
2017 (Runner-up)

REFERENCES:

Prof. Zander Myburg
Forest Molecular Genetics Programme Director
University of Pretoria
Role: Current line manager, MSc supervisor

Dr Daleen van Dyk
Senior Research Associate at Corteva Agriscience
Johnston, Iowa, United States
Role: Former manager at the Forest Molecular Genetics Programme, MSc advisor

Contact details available upon request

TEACHING AND STUDENT MENTORSHIP:

TEACHING ASSISTANT

GTS161 – Introductory Genetics
University of Pretoria - Department of Genetics
July 2007 - November 2007
Teaching assistance in weekly tutorial sessions

COURSES

An Introduction to Modern Tree Breeding
Pretoria
September 2015, August 2017, October 2019, May 2020, September 2022
Module: Molecular Markers

Introductory Microsatellite Workshop
Pretoria
May 2020, June 2021
Module: data analysis in diploids, SNPs as markers

POSTGRADUATE STUDENT CO-SUPERVISION

Mr James Smith (19013583) - Current
BSc Hons. Genetics (2023)
University of Pretoria, Department of Biochemistry, Genetics and Microbiology
Title: DNA fingerprinting and genome-wide genotyping of South African Macadamia germplasm

Ms Anneri Lötter (14014442) - Cum laude
BSc Hons. Genetics (2018)
University of Pretoria, Department of Biochemistry, Genetics and Microbiology
Title: Admixture mapping using genome-wide SNP marker analysis in *Eucalyptus grandis* x *E. urophylla* backcross progeny

Ms Julia Candotti (14010560) - Cum laude
BSc Hons. Genetics (2017)
University of Pretoria, Department of Biochemistry, Genetics and Microbiology
Title: Nested Association Mapping (NAM) in *Eucalyptus* hybrids

Mr Johannes Stephanus Henning (13091752)
BSc Hons. Genetics (2016)
University of Pretoria, Department of Biochemistry, Genetics and Microbiology
Title: SNP markers for genome-wide tracking of interspecific introgression in *Eucalyptus*

Mr Stephanus Engelbrecht (12016642) - Cum laude
Bsc Hons. Genetics (2015)
University of Pretoria, Department of Biochemistry, Genetics and Microbiology
Title: High-throughput multiplexed SNP genotyping for DNA fingerprinting of *Eucalyptus* species and hybrids

POSTGRADUATE STUDENT ADVISORY COMMITTEE

Served on the advisory committee of four postgraduate students

SUMMARY OF RESEARCH OUTPUTS:

- Co-author on five ISI-rated peer-reviewed publications
- 19 International conference contributions
- 16 Local conference contributions

TEACHING AND STUDENT MENTORSHIP (ADDITIONAL DETAILS):

POSTGRADUATE STUDENT ADVISORY COMMITTEE (4)

Mr Mondli Xaba (19191252)

MSc Bioinformatics (2020 - ongoing)

University of Pretoria, Department of Biochemistry, Genetics and Microbiology

Preliminary Title: *Acacia* genome project

Ms Mary Ranketse (17402345)

PhD Genetics (2018 - ongoing)

University of Pretoria, Department of Biochemistry, Genetics and Microbiology

Preliminary Title: Genomic characterization and resources for macadamia nut cultivars for advanced genetic breeding

Mr Johannes Stephanus Henning (13091752)

MSc Genetics (2017 - 2021)

University of Pretoria, Department of Biochemistry, Genetics and Microbiology

Title: Genomic diversity atlas of *Eucalyptus* towards effective genome-wide genetic resource management in plantation breeding

Mr Junior Tii-Kuzu (11256576)

MSc Genetics (2016 - ongoing)

University of Pretoria, Department of Biochemistry, Genetics and Microbiology

Preliminary Title: Population structure and phylogeography of the Mesoamerican *Oocarpae* pine complex in the cloud forests of Mexico

DETAILED RESEARCH OUTPUTS:

CO-AUTHORSHIP ON ISI-RATED PEER-REVIEWED PUBLICATIONS (5)

Candotti J, Christie N, Ployet R, Mostert-O'Neill MM, **Reynolds SM**, Neves LG, Naidoo S, Mizrahi E, Duong TA, Myburg AA. 2023. Haplotype mining panel for genetic dissection and breeding in *Eucalyptus*. *The Plant Journal* 113: 174-185. (<https://doi.org/10.1111/tpj.16026>)

Mostert-O'Neill MM, Tate H, **Reynolds SM**, Mphahlele MM, van den Berg G, Verryn SD, Acosta JJ, Borevitz JO and Myburg AA. 2022. Genomic consequences of artificial selection during early domestication of a wood fibre crop. *New Phytologist* 235: 1944-1956. (<https://doi.org/10.1111/nph.18297>)

Jackson C, Christie N, **Reynolds SM**, Marais GC, Tii-Kuzu Y, Caballero M, Kampman T, Visser EA, Naidoo S, Kain D, Whetten RW, Isik F, Wegrzyn J, Hodge GR, Acosta JJ, Myburg AA. 2021. A genome-wide SNP genotyping resource for tropical pine tree species. *Molecular Ecology Resources* 22(2): 695-710. (<https://doi.org/10.1111/1755-0998.13484>)

Mostert-O'Neill MM, **Reynolds SM**, Acosta JJ, Lee DJ, Borevitz JO, Myburg AA. 2020. Genomic evidence of introgression and adaptation in a model subtropical tree species, *Eucalyptus grandis*. *Molecular Ecology* 30: 625- 638. (<https://doi.org/10.1111/mec.15615>)

Mphahlele MM, Isik F, Mostert-O'Neill MM, **Reynolds SM**, Hodge GR, Myburg AA. 2020. Expected benefits of genomic selection for growth and wood quality traits in *Eucalyptus grandis*. *Tree Genetics & Genomes* 16: 49. (<https://doi.org/10.1007/s11295-020-01443-1>)

GENERAL INTEREST PUBLICATIONS (2)

Melissa Reynolds, Ronishree Mangwanda and Zander Myburg. 2022. DNA fingerprinting tools for small-scale timber growers. *Forestry South Africa's Forestry in Focus*. Issue 008, July to September 2022

Melissa Reynolds, Marja Mostert-O'Neill, Zelda du Toit-Boshoff, Nanette Christie and Zander Myburg. 2021. The value of DNA markers in the South African forestry industry. *Forestry South Africa's Timber Industry Presents Magazine (TIP-Mag)* Volume 2 Number 2, 2021

DETAILED RESEARCH OUTPUTS (CONT.):

INTERNATIONAL CONFERENCE CONTRIBUTIONS (19)

Alexander A. Myburg, Julia Candotti, Anneri Lötter, **Melissa Reynolds**, Nanette Christie, Marja M. Mostert-O'Neill. 2022. A pan-genome view of complex trait dissection in *Eucalyptus*. Population, Evolutionary and Quantitative Genetics Conference, 7-10 June 2022, Pacific Grove, CA and online (poster presentation)

Nanette Christie, Colin Jackson, **Melissa Reynolds**, Christopher Marais, Tamanique Kampman, Erik A. Visser, Sanushka Naidoo, Dominic Kain, Gary R. Hodge, Jill L. Wegrzyn, Juan Jose Acosta, Alexander A. Myburg. 2020. A genome-wide 50k SNP genotyping array for tropical and sub-tropical pine tree species. Plant Biology World Summit 2020, 27-31 July 2020, Online conference (poster presentation)

Marja M. Mostert-O'Neill, **S. Melissa Reynolds**, M. Mmoledi Mphahlele, Gert van den Berg, Steve D. Verry, Juan J. Acosta, Justin O. Borevitz and Alexander A. Myburg. 2020. *Eucalyptus grandis* domestication: genomic consequences of 100 years of artificial selection. Plant Biology World Summit 2020, 27-31 July 2020, Online conference (poster presentation)

Colin Jackson, Nanette Christie, Madison Caballero, **Melissa Reynolds**, Christopher Marais, Erik A. Visser, Sanushka Naidoo, Gary R. Hodge, Ross Whetten, Fikret Isik, Jill L. Wegrzyn, Juan Jose Acosta, Alexander A. Myburg. 2020. Development of a high-throughput genome-wide genotyping array for tropical and subtropical pine species. Plant and Animal Genome XXVIII Conference, 11-15 January 2020, San Diego, CA, USA (oral presentation)

Alexander A. Myburg, Marja O'Neill, Julia Candotti, Anneri Lotter, Stephan Henning, Stephan Engelbrecht, **Melissa Reynolds**, Nanette Christie. 2020. Landscape genomics, ancestry mapping and nested association analysis in *Eucalyptus grandis* and its interspecific hybrids. Plant and Animal Genome XXVIII Conference, 11-15 January 2020, San Diego, CA, USA (oral presentation)

O'Neill MM, **Reynolds SM**, Lee DJ, Acosta JJ, Borevitz JO and Myburg AA. 2019. Genomic evidence of introgression and adaptation in *Eucalyptus grandis*, a model subtropical species. IUFRO Tree Biotechnology Meeting, 23 – 28 June 2019, Raleigh, NC, USA (oral presentation)

Candotti J, O'Neill MM, **Reynolds SM**, Naidoo R, Jones N, Mizrachi E, Myburg AA. 2019. Genetic dissection in a multi-parent *Eucalyptus* F1 hybrid mapping population. IUFRO Tree Biotechnology Meeting, 23 – 28 June 2019, Raleigh, NC, USA (poster presentation and flash talk)

Lötter A, Henning JS, Engelbrecht S, O'Neill M, **Reynolds SM**, Mphahlele MM, Payn KG, Myburg AA. 2019. Local ancestry mapping in advanced generation *Eucalyptus grandis* x *E. nitens* hybrids. IUFRO Tree Biotechnology Meeting, 23 – 28 June 2019, Raleigh, NC, USA (poster presentation and flash talk)

O'Neill MM, **Reynolds SM**, Lee DJ, Acosta JJ, Borevitz JO and Myburg AA. 2019. The genetic landscape of adaptive variation in native *Eucalyptus grandis*. International *Eucalyptus* Genetics Conference, 18 – 21 February 2019, Hobart, Australia (oral presentation)

Candotti J, O'Neill MM, **Reynolds SM**, Naidoo R, Jones N, Mizrachi E, Myburg AA. 2019. Genetic dissection of growth and wood development in nested, multi-parent *Eucalyptus* hybrid populations. International *Eucalyptus* Genetics Conference, 18 – 21 February 2019, Hobart, Australia (flash talk)

S. Melissa Reynolds, Anneri Lötter, Marja M. O'Neill, J. Stephan Henning, Stephan Engelbrecht, M. Mmoledi Mphahlele, Steve D. Verry, Kitt G. Payn, Nicoletta Jones, Arnulf Kanzler, Alexander A. Myburg. 2019. *Eucalyptus* Genome Diversity Atlas: Applications for molecular breeding in advanced generation interspecific hybrids. International *Eucalyptus* Genetics Conference 18-21 Feb 2019, Hobart, Tasmania, Australia (poster presentation)

Myburg AA, Wierzbicki MP, Candotti J, Lotter A, Henning S, Engelbrecht S, **Reynolds SM**, O'Neill M, Pinard D, Ployet R, Maloney V, Christie N, Hussey SG, Naidoo S, Mizrachi E. 2019. *Eucalyptus* in the postgenomic era: Leveraging the power of genetics and genomics to unravel the biology of development, defence and adaptation in eucalypts. International *Eucalyptus* Genetics Conference 18-21 Feb 2019, Hobart, Tasmania, Australia (plenary presentation)

DETAILED RESEARCH OUTPUTS (CONT.):

INTERNATIONAL CONFERENCE CONTRIBUTIONS CONT. (19)

Myburg AA, O'Neill MM, **Reynolds SM**, Henning JS, Engelbrecht S, Verryn SD, Mphahlele MM, Naidoo R, Acosta JJ, Hodge GR, Jones N, Kanzler A, Payn KG. 2018. Genome diversity of commercially grown *Eucalyptus* species and hybrids: Towards landscape genomics for genetic resource management and molecular breeding. IUFRO *Eucalyptus* 2018: Managing *Eucalyptus* plantations under global change. Montpellier, France, 17-21 September 2018 (oral presentation)

Wayne Jones, Luke Solomon and **Melissa Reynolds**. 2015. Use of DNA fingerprinting technology to understand the outcrossing rates in *Eucalyptus dunnii* seed orchards. IUFRO Eucalypt Conference, Guangxi, China, 21-24 October 2015 (poster presentation)

G Galloway, **SM Reynolds**, AJ van Rensburg, S Naidoo, A Kanzler AA Myburg. 2015. Determining levels of natural contamination of *Eucalyptus urophylla* in an *E. grandis* population in South Africa using microsatellite DNA markers. IUFRO Eucalypt Conference, 21-24 October 2015, Guangxi, China (oral presentation)

Mmoledi Mphahlele, Francois van Deventer, **Melissa Reynolds**, Marja O'Neill, Gary Hodge, Fikrit Isik, Alexander Myburg. 2015. Genotyping and phenotyping of a *Eucalyptus grandis* training population towards the development of genomic selection models. IUFRO Tree Biotechnology Conference, 8-12 June 2015, Florence, Italy (poster presentation)

Myburg AA, Calvert M, Singh P, Mbanjo G, Van der Merwe K, O'Neill MM, **Reynolds M**, Christie N, Hussey SG, Mizrachi E. 2014. Population genomics unravels genetic diversity and regulation of growth and development in *Eucalyptus*. Australasian Genomics Technology Association Meeting, 12 - 15 October, Melbourne, Australia (oral presentation)

Mbanjo EGN, O'Neill MM, **Reynolds SM**, Jones N, Kanzler A, Myburg AA. 2014. High-density SNP-based genetic map of an interspecific backcross pedigree of *Eucalyptus grandis* x *E. urophylla*. Plant & Animal Genome XXII Conference, P486, 11-15 January 2014, San Diego, CA (poster presentation)

Melissa Reynolds, Daleen van Dyk, Mingcheng Luo, Emmanuel Okogbenin, Luis Augusto Becerra Lopez-Lavalle, Morag Ferguson, Alexander Myburg, Pablo Rabinowicz. 2011. Preliminary genetic linkage mapping of Cassava (*Manihot esculenta*) using SNP markers. Generation Challenge Program General Research Meeting, 21-25 September 2011, Hyderabad, India (poster presentation)

LOCAL CONFERENCE CONTRIBUTIONS (16)

Melissa Reynolds. 2023. The Macadamia DNA fingerprinting service. SAMAC Research Networking Day, 8-9 June 2023. Boksburg, South Africa (oral presentation)

Mostert-O'Neill MM, Borevitz JO, Acosta JJ, **Reynolds SM**, Mphahlele MM, Van den Berg G, Verryn SD, Myburg AA. 2020. Domesticating *Eucalyptus grandis* for changing climates using landscape genomics. Southern African Plant Breeding Symposium, 8 - 11 March 2020, Pretoria, South Africa (oral presentation)

Candotti J, Mostert-O'Neill MM, **Reynolds SM**, Naidoo R, Jones N, Mizrachi M, Myburg AA. 2020. QTL mapping and analysis of segregation distortion in a multi-parent *Eucalyptus* F1 hybrid mapping population planted across multiple environments. Southern African Plant Breeding Symposium, 8 - 11 March 2020, Pretoria, South Africa (flash talk)

O'Neill MM, **Reynolds SM**, Acosta JJ, Borevitz JO, Myburg AA. 2018. Spatial and adaptive population structure of native *Eucalyptus grandis*. South African Society for Bioinformatics & South African Genetics Society (SASBi-SAGS) Joint Conference, 16 - 18 October 2018, Golden Gate Highlands National Park, South Africa (oral presentation)

Henning JS, O'Neill MM, **Reynolds SM**, Engelbrecht S, Payn KG, Van der Merwe A, Myburg AA. 2018. *Eucalyptus* genomic diversity atlas: towards genome-based genetic resource management in commercially planted eucalypts. South African Society for Bioinformatics & South African Genetics Society (SASBi-SAGS) Joint Conference, 16 - 18 October 2018, Golden Gate Highlands National Park, South Africa (oral presentation)

DETAILED RESEARCH OUTPUTS (CONT.):

LOCAL CONFERENCE CONTRIBUTIONS CONT. (16)

Candotti J, O'Neill MM, **Reynolds SM**, Naidoo S, Kanzler A, Jones N, Mizrahi E, Myburg AA. 2018. Towards nested, multi-parent genetic dissection of growth and wood development in *Eucalyptus* hybrid populations. South African Society for Bioinformatics & South African Genetics Society (SASBi-SAGS) Joint Conference, 16 - 18 October 2018, Golden Gate Highlands National Park, South Africa (poster presentation)

Tii-Kuzu YJ, **Reynolds SM**, Hodge G, Kanzler A, Payn KG, Myburg AA. 2018. DNA-based evolutionary history of topical pines of Mesoamerican *Oocarpae* complex. South African Association of Botanists (SAAB) Congress, 9-12 January 2018, Pretoria, South Africa (abstract published in South African Journal of Botany 115, 311-312) (oral presentation)

Reynolds SM, Tii-Kuzu YJ, Ranade SS, O'Neill MM, Henning JS, TL Swain TL, Meyer B, Verryn SD, Mphahlele MM, van Deventer F, van der Hoef A, Nel A, le Roux T, de Waal L, Acosta JJ, Isik F, Hodge GR, Payn KG, Kanzler A, Naidoo S, Myburg AA. 2017. The development of a genomic diversity atlas for pine and eucalypt species of importance to the South African forestry industry. The South African Forestry Research 7th Forest Science Symposium, 18 -20 July 2017, Pietermaritzburg, South Africa (oral presentation)

Engelbrecht S, Henning S, **Reynolds SM**, Marais C, Myburg AA. 2016. High-throughput SNP-based fingerprinting of *Eucalyptus* species and hybrids for routine breeding applications. South African Society for Bioinformatics and South African Genetics Society Conference, 20-23 September 2016, Durban, South Africa (poster presentation)

O'Neill MM, **Reynolds SM**, Mphahlele M, Louw A, Galloway G, Jones N, Kanzler A, Du Plessis, Pienaar B and Myburg AA. 2014. High-throughput SNP marker genotyping for genomic selection of growth and wood properties in *Eucalyptus*. Sixth Forest Science Symposium, 29-30 July 2014, Pietermaritzburg, South Africa (poster presentation)

Reynolds SM, Payn K, Nel A, Van der Hoef A, Hongwane P, Isaza N, Hodge GR, Dvorak WS and Myburg AA. 2014. Development and validation of a panel of microsatellite markers for species discrimination in *P. tecunumanii* and *P. patula*. Sixth Forest Science Symposium, 29-30 July 2014, Pietermaritzburg, South Africa (poster presentation)

Mphahlele M, Hodge G, Isik F, Du Plessis, Pienaar, Van Deventer, **Reynolds SM**, O'Neill MM and Myburg AA. 2014. Opportunities and challenges of genomic selection for growth, wood properties and disease resistance in *E. grandis* breeding. Sixth Forest Science Symposium, 29-30 July 2014, Pietermaritzburg, South Africa (poster presentation)

Reynolds SM, Van Dyk MM, Luo M, Okogbenin E, Becerra Lopez-Lavalle LA, Ferguson M, Myburg AA and Rabinowicz P. 2012. Genetic linkage mapping and whole-genome SNP diversity analysis of cassava (*Manihot esculenta*). South African Genetics & Bioinformatics Society Conference, "The Data-mining Revolution", The Conservatoire, University of Stellenbosch, 10-12 September 2012, Stellenbosch, South Africa (oral presentation)

Reynolds SM, Van Dyk MM, Luo M, Okogbenin E, Becerra Lopez-Lavalle LA, Ferguson M, Myburg AA and Rabinowicz P. 2012. SNP genetic linkage maps of cassava (*Manihot esculenta*). South African Association of Botanists Symposium, 15-18 January 2012, Pretoria, South Africa (poster presentation)

Van Dyk MM, **Reynolds SM**, O'Neill MM, Ralikonyana P, Myburg AA, FMG Research Team. 2010. DNA fingerprinting: A platform for clonal identification and parentage analysis in breeding programmes. Fourth Forest Science Symposium, 3-4 August 2010, Pietermaritzburg, South Africa (poster presentation)

Van Dyk MM, **Reynolds SM**, Goddard S, Cowley E, Myburg AA. 2010. Microsatellite markers for fingerprinting and parentage analysis in eucalypt and pine tree breeding programmes. South African Plant Breeders Association Symposium, 6-7 April 2010, Stellenbosch, South Africa (poster presentation)