Curriculum Vitae

Name Professor Geoffrey Ian McFadden *PhD FAA FASP FAAM*

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Academic Qualifications

1980-1984	PhD, University of Melbourne, Supervisor - Dr. R. Wetherbee.
1976-1979	BSc Hons (First Class Honours), University of Melbourne.

Academic Appointments

2017-2022	ARC Laureate Fellow, School of BioSciences, Univ. of Melbourne
2012-2017	Professor, School of BioSciences, Univ. of Melbourne
2007-2011	ARC Federation Fellow, Howard Hughes International Scholar School of Botany, Univ. of Melbourne
2002 -6	ARC Professorial Fellow, School of Botany, Univ. of Melbourne
2000-2010	Howard Hughes International Scholar
1996-2001	Associate Professor & Reader, School of Botany, Univ. of Melbourne
1995	Scientist, Institute for Marine Biosciences, National Research Council, Halifax, Canada
1991-1994	ARC Senior Research Fellow, School of Botany, Univ. of Melbourne
1990	Research Fellow, Grade 2 with Professor J. Pickett-Heaps, School of Botany, Univ. of Melbourne
1986-1989	ARC Queen Elizabeth II Fellow, with Professor A. Clarke, Plant Cell Biology Research Centre, Univ. of Melbourne
1984-1986	Post-Doctoral Fellow, Universität Münster, Germany.

Current Affiliations

Fellow – Australian Academy of Sciences (2005-) www.science.org.au/
Convener – Australia/Europe Malaria Research Cooperative (2009-) www.ozemalar.org
Fellow – Australian Society for Parasitology (2014-) www.parasite.org.au
Fellow – American Academy of Microbiology (2015-) www.academy.asm.org

Scientific honours & prizes

1979	McBain Research Scholarship in Botany, University of Melbourne
1979 & 80	Selected to participate in two Australian National Antarctic Research Expeditions (ANARE)
1980-4	Commonwealth Postgraduate Research Award
1983	Best Student Paper Award, VIth Australian Society for Phycology & Aquatic Botany Meetings
1986	Queen Elizabeth II Fellow, Australian Research Council
1987	Travel grant "Outstanding Young Botanist", International Botanical Congress Committee, Berlin
1989	Best Poster Prize, Australian & New Zealand Society for Cell Biology Meetings (Melbourne)
1990	Goldacre Medalist, Australian Plant Physiology Society's Award for Scientific Excellence
1991	Awarded Australian Research Council Senior Research Fellowship (5 years tenure)
1998	Awarded Australian Academy of Science's Frederick White Prize
1998	Elected Associate of Canadian Inst. of Advanced Research (CIAR) Program in Evolutionary Biology
2000 & 2005	Howard Hughes International Research Scholar (two 5-year awards)
2001	David Syme Research Prize, Best Australian Research by scientist beneath the rank of full Professor
2002	Full Professorial Fellowship Australian Research Council
2002	Miescher-Ishida Prize, International Society of Endocytobiology
2003	Woodward Medalist (best research of the year, Univ. of Melbourne)
2005	Fellow – Australian Academy of Sciences
2006	Julian Wells Medalist, Lorne Genome Conference
2007	Federation Fellow, Australian Research Council
2009	The Royal Society of Victoria Research Medal for Scientific Research in Biological Sciences
2009	The Ramaciotti Medal for Excellence in Biomedical Research
2014	Fellow - Australian Society of Parasitology
2015	Fellow - American Academy of Microbiology
2017	Laureate Professorial Fellow, Australian Research Council
2018	Woodward Medalist, Best Research of the Year, University of Melbourne
2019	Ralph Slatyer medalist, Research School of Biological Sciences, Australian National University

Most important scientific positions of trust held

- President for International Society of Evolutionary Protistology (ISEP) 2005-2006
- Invited to make nominations (two successful) to Nobel Foundation for Nobel Prize in Chemistry (2002-2010)
- Invited to make nominations to the International Prize for Biology (2006)
- Invited to make nominations for the Crafoord Prize in Biosciences 2015
- Chair of selection committee (Plant Sciences & Microbiology) for Australian Academy of Sciences (2007-2011)
- Convener of Australia/Europe Malaria Research Cooperative www.ozemalar.org
- International Scientific Advisory Board for Wellcome Centre for Molecular Parasitology, UK (20017-)

Stewardship of the literature

- Editorial Board – *Microorganisms* (2013-)
- Editorial Board – *Protist Genomics* (2013-)
- Associate Editor – *Marine Genomics* (2009-2012)
- Associate Editor - *Genomic Biology & Evolution* (2009-)
- Editorial Board – *Journal of Phycology* (2012-14)
- Editorial Board - *Biology Image Library, BioMed Central* (2005-2014)
- Editorial Board - *European Journal Phycology* (2000-2010)
- Associate Editor - *Molecular Biology & Evolution* (1999-2008)
- Editorial Board - *Today's Life Sciences* (1998-2003)

Grants received

I secured my salary from the Australian Research Council from 1986 to 2022 (with a single 5-year gap) working my way up through a QEII Fellowship, Senior Research Fellowship, Professorial Fellowship, Federation Fellowship, and a Laureate Fellowship. I have had three consecutive, 5-year Program Grants from the National Health & Medical Research Council plus continuous Discovery Project funding from the ARC (11 grants) since 1986. I have had two 5-year Howard Hughes Medical Institute International Scholar Grants. I have raised $43 million dollars in externally funded grants listed as a PI in the last 5 years.

Publications and impact: a full list of papers and PDF files are available at www.geoffmcfadden.com

I have authored eight papers in *Nature*, four papers in *Science*, eleven papers in *PNAS,* seven papers in *Current Biology,* one paper in *Cell*, and three papers in *EMBO J*. I have published 267 papers. My publications have been cited >25,000 times by other authors (Google Scholar™), and I have 48 papers with more than 100 citations including eight with >400, plus the malaria parasite genome paper with >4,000 citations. My papers average 83 citations each over my career, and my Google Scholar™ *h*-index is 81. My papers have been featured as the journal cover illustration 21 times. I am ranked 12th in the world for 'malaria' on Google Scholar™ , 5th in the world for 'symbiosis' on Google Scholar™ , and I am in the 98th percentile of the 15 million ResearchGate™ subscribers.

A statement of my leadership, mentoring and management abilities

My leadership ability to build world-class research capacity and diverse teams has six key elements: i/ assembling a diverse team that can generate critical new knowledge; ii/ training young team members to identify and answer important scientific questions; iii/ mentoring young team members towards creative, independent research in their own labs or in industry; iv/ providing facilities and equipment for my team; v/ creating research platforms for the broader community; and vi/ fostering the links and networks in my discipline by creating opportunities for young researchers to experience scientific exchange both through conferences and overseas research exchange experiences.

Building world-class research capacity & diverse teams

I have built a well-funded, well-equipped, well-housed research team (currently 14 people) with strong collaborative links both locally and internationally. We perform state-of-the-art molecular, cellular and metabolomic biology on malaria parasites with a strategic focus on basic biology with potential applications to disease control. My team has included a mix of postdoctoral fellows (several bringing their own funding from France, Switzerland, Japan, Germany, USA, Canada and Indonesia), PhD students (both national and international), undergraduate and BSc Honours students, research assistants (recruited from Malaysia and The Netherlands), sabbatical visitors (Japan, Canada, USA, Greece, Singapore), trainees (Army Malaria Institute), and interns (Germany and France).

Leading young scientists to successful research careers in academia and industry

I have trained 21 postgraduate students (primary supervisor for 17) and 17 postdoctoral fellows. My students and postdocs have received prestigious awards such as a Victoria Fellowship and the Premier's Prize for Medical Research (Ross Waller), ARC Future Fellowships (Stuart Ralph, Chris Tonkin, Rowena Martin), the Bioplatforms Australia Award (Chris Tonkin), a L'Oreal Women in Science Fellowship and a Eureka Prize (Rowena Martin), the Ulrich-Hadding Research Prize and the Peter-Sitte Award (Sven Gould), Peter Doherty Fellowships (Ross Waller & Chris Tonkin), RD Wright Fellowships (Stuart Ralph & Rowena Martin), a CJ Martin Fellowship (Giel van Dooren), Young Tall Poppy Awards (Chris Tonkin & Rowena Martin), a Fulbright Fellowship and Golden Apple Award (Russ

Johnson), Finovi Young Team Leader, European Young Lipid Researcher Award, Excellence in Academic Research (Cyrille Botté), and an ARC QEII Fellowship (Giel van Dooren).

Almost all my mentees have gone on to become strong, independent researchers now leading their own groups at prestigious Australian research institutions. Two mentees (David Orlovich and Stuart Ralph) now lead University departments. Others mentees have secured positions at WEHI (A. Prof Chris Tonkin), Burnet Institute (A. Prof Paul Gilson), Deakin University (Dr Ming Kalanon & Mr Wes Webster), Royal Botanic Gardens Victoria (Dr Frank Udovicic), Bio21 Institute (Head of School of Biochemistry & Molecular Biology Stuart Ralph), Australian National University (A. Prof Giel van Dooren, Dr Rowena Martin), Hudson Institute of Medical Research, Monash Medical Centre (Dr James Deane); or renowned international institutions and industries including Cambridge University (A. Prof Ross Waller & Dr Ellen Nisbet), Johns Hopkins Medical School USA (Dr Melanie Shears), Novartis™ Singapore (Dr Liting Lim), CSL (Dr Nadira Samad), Primary Children's Hospital, Utah, USA (Dr Russ Johnson), Sandia National Labs USA (Dr Oliver Kilian), TropicIQ Health Sciences™ Netherlands (Dr Angelika Sturm), University of British Columbia Canada (Prof Patrick Keeling), Université de Limoges France (Dr Agnes Germot), Université Joseph Fourier France (Dr Cyrille Botté & Dr Nick Katris), University of Otago New Zealand (A. Prof and Head of School David Orlovich), Eppendorf™ Germany (Dr Claudia Hoffman), ESBATech™ Switzerland (Dr Attila Regos), Sophia Genetics™ Switzerland (Dr Bernardo Foth), and Heinrich Heine Univ. Germany (A. Prof Sven Gould). One student (Dr Louise Phillips) has taken her skills to the cultural side and is now General Manager of The Australian Boys Choir.

Securing resources for world-class research capacity

Resourcing my team with state-of-the-art equipment and facilities is a key role as their leader. I have secured almost continuous ARC funding for my salary from 1986-2022. I have also held continuous Discovery Grant support (11x) from the ARC since 1989. Similarly, I have been able to translate some of my basic malaria discoveries into health practice by securing three consecutive NHMRC Program Grants, nine NHMRC Project Grants, and two consecutive five-year Howard Hughes Medical Institute grants. These funding levels and the associated consortia have been a magnet for talented postdoctoral researchers, graduate and undergraduate students, and more established practitioners on sabbatical visits to come to the Parkville Biosciences Precinct to pursue first-rate cell biology, evolutionary biology, and strategic malaria research.

Creating platforms to underpin world-class research capacity

Creating platforms for the wider community of researchers is also required of world-class leaders. Since 2013, I have won five major equipment grants to procure high-end microscopy facilities for my colleagues in and around Melbourne. I led a grant ($0.7m) to establish the first 3D cryo electron microscopy facility in Victoria to provide vital new capacity to researchers from University of Melbourne, RMIT, WEHI, and the Murdoch Children's Research Institute. Another grant ($0.65m) provided a 2-photon confocal microscope for The University of Melbourne, Deakin Univ, Monash Univ, and the Burnet Inst, which significantly expanded our capacity for high-end light microscopy and was used to publish with colleagues from the Peter Doherty Institute some remarkable videos of T-cells hunting malaria parasites recently in *Immunology*. Further grants ($0.35m) procured a spinning disc confocal microscope for plant research, and $0.54m procured an automated 3D electron microscopy facility to expand local capacity for advanced microscopy. I recently led a successful bid for $1.05m from the ARC to buy new electron microscopes for UoM, LaTrobe Univ. and RMIT.

I created Australia's first *Anopheles stephensi* malaria mosquito colony. We started the only facility at the time in Australia to complete the full rodent malaria life cycle, giving the malaria research community access to vital experimental options including gene knockout analyses across the life cycle, immunological challenge of vaccinated mice, and resources for omics studies on stages other than blood phases; the only stage previously available. We interact with a cadre of clinicians, field physicians, military researchers, chemists, immunologists and vaccine developers to pursue cures for malaria in a strategic and high-tech way.

I chair the School of BioSciences Infrastructure Committee, and I manage the School's Advanced Microscopy Facility with three electron microscopes and three confocal laser scopes. I am a member of the University of Melbourne Research and Infrastructure Committee (MCRIC), which looks after 22 individual research platforms covering over 12,000 square metres of University space. MCRIC platforms represent a collective asset value in excess of $136m with an annual operational cost of over $20m per year, including the ~170 FTE platform workforce.

World-class leadership roles

Examples of world-class leadership are my role as Past President of the International Society of Evolutionary Protistology, my extensive editorial roles, my role as instigator and ongoing organiser of the *Chromera* coral symbiont workshops at the Great Barrier Reef, my recent role in co-leading a consortium of genomicists to fund and then publish two algal genomes in *Nature*. I chaired the Australian Academy of Science fellow selection panel (2007-2011) vetting candidates for admission into Australia's highest-ranking science establishment. My proudest leadership role is as creator and convener of OzEMalaR (Australia/Europe Malaria Research). OzEMalaR created 75 opportunities for young Australian researchers to do research in overseas labs and attend high-end workshops and training courses by securing a budget of $0.8m from the NHMRC. As co-creator of the ARC/NHMRC Network of Parasitology (with Nick Smith and Leann Tilley) and as creator of OzEMalaR, I have been able to provide early career researchers with unique opportunities to work in foreign labs and participate in international meetings. I have

assembled international assessment panels to select awardees with the aim of fostering their development and experience portfolios to make Australia's best and brightest more internationally competitive and productive.

Building a diverse and successful team

Assembling a top research team is not as simple as "*build it and they will come*". Sleek buildings and hi-tech instruments are attractive to recruits, but what they really look for is a successful team with excellent morale and a 'buzz' around it. Top morale requires making sure everyone is looked after, lauded for success, and supported when things get difficult. Getting a team to work together and succeed at the top level requires a leader being engaged, present, inspirational, and empathic. The research leader must instill the highest standards of rigour, ethics, and enquiry. My personal philosophy is to get my team together weekly for lab meeting, which we can do in our dual-purpose office/meeting space. The format is casual, fun, supportive, but always rigorous. New data are shared, pored over, debated, and assessed in a constructive yet critical way. Everyone presents turnabout, from me to the technical support staff. Anyone who attended a conference gives a report on the hot new findings they encountered, which helps to keep us all abreast as well as learning who the players are in our topics. We also assemble for journal club monthly where we pick apart a recent relevant paper looking at the achievements, the insights, the shortcomings and the approach. I use this forum to provide an overview of why a question is significant, how the other group has addressed it, and how we might have done it better. I also set aside one-on-one time with each mentee. Everyone has a scheduled weekly meeting. Casual, unscheduled chats about their project, their life, a life in science, their career aspirations, a cool new paper, or where they see them self now and later are often the most rewarding part of my 'job'.

Financial Management Experience

My research team currently includes 14 people. I am responsible for managing this team, which includes senior scientists, graduate students and technical assistants. Our goal is to find new drug therapies for malaria. I have to secure the budget to support this team's salaries and consumables, and my group is unusual in attracting money for overseas funding agencies such as the US-based Howard Hughes Medical Institute. My laboratory's annual income for 2020 is $1,650,000.

I was on a board of eight principal investigators sharing a $12.7m 'Program Grant' from the National Health and Medical Research Council in 2010-2014. My board was responsible for management and direction setting for a team of 70 infectious diseases scientists spread across University of Melbourne, Walter & Eliza Hall Medical Research Institute, Bio21, Burnet Institute and the Royal Melbourne Hospital. Our Program Grant has had three 5-year iterations. I chaired this board and secured its second renewal in 2006.

I was Deputy Head of the School of BioSciences (formerly Botany, Zoology & Genetics) from 2009-2017 (I stepped down to take up the Laureate Fellowship), and I now sit on the School's Executive, which is chaired by the Head of School, Prof Ute Roessner. The executive is responsible for formulation of strategy and implementation of goals for the School. We make the key strategic decisions regarding budgets, infrastructure, personnel, succession planning and future direction setting. We oversee the activities of 459 personnel (scientists, administrative personnel, animal houses, workshop and glasshouse staff, and 90 postgraduate students). The School executive is responsible for the management of an annual budget of ~$38m.

2020 publications: a full list of papers and PDF files are available at www.geoffmcfadden.com

[1]. Ghilas, S., Enders, M.H., May, R., Holz, L.E., Fernandez-Ruiz, D., Cozijnsen, A., Mollard, V., Cockburn, I.A., McFadden, G.I., Heath, W.R., and Beattie, L., (2021) Development of *Plasmodium*-specific liver-resident memory CD8(+) T cells after heat-killed sporozoite immunization in mice. *Eur J Immunol*,

[2]. Valencia-Hernandez, A.M., Ng, W.Y., Ghazanfari, N., Ghilas, S., de Menezes, M.N., Holz, L.E., Huang, C., English, K., Naung, M., Tan, P.S., Tullett, K.M., Steiner, T.M., Enders, M.H., Beattie, L., Chua, Y.C., Jones, C.M., Cozijnsen, A., Mollard, V., Cai, Y., Bowen, D.G., Purcell, A.W., La Gruta, N.L., Villadangos, J.A., de Koning-Ward, T., Barry, A.E., Barchet, W., Cockburn, I.A., McFadden, G.I., Gras, S., Lahoud, M.H., Bertolino, P., Schittenhelm, R.B., Caminschi, I., Heath, W.R., and Fernandez-Ruiz, D., (2020) A natural peptide antigen within the *Plasmodium* ribosomal protein RPL6 confers liver TRM cell-mediated immunity against malaria in mice. *Cell Host Microbe*,

[3]. Tortorelli, G., Belderok, R., Davy, S., McFadden, G., and van Oppen, M., (2020) Host genotypic effect on algal symbiosis establishment in the coral model, the anemone *Exaiptasia diaphana*, from the Great barrier reef. *Frontiers Marine Sci*. **6**: 833

[4]. Tjhin, E.T., Hayward, J.A., McFadden, G.I., and van Dooren, G.G., (2020) Characterization of the apicoplast-localized enzyme *Tg*UroD in *Toxoplasma gondii* reveals a key role of the apicoplast in heme biosynthesis. *J Biol Chem*. **295**: 1539-1550

[5]. Maor-Landaw, K., van Oppen, M.J.H., and McFadden, G.I., (2020) Symbiotic lifestyle triggers drastic changes in the gene expression of the algal endosymbiont Breviolum minutum (Symbiodiniaceae). *Ecol Evol*. **10**: 451-466

[6]. Katris, N., Yamaryo-Botté, Y., Janouskovec, J., Shunmugan, S., Arnold, C.-S., Yang, S., Vardakis, A., Stewart, R., Sauerwein, R., McFadden, G., Tonkin, C., Cesbron_Delauw, M.-F., Waller, R., and Botte, C.Y., (2020) Rapid kinetics of lipid second messengers controlled by a cGMP signalling network coordinates apical complex functions in Toxoplasma tachyzoites. *bioRxiv*,

[7]. Holz, L.E., Chua, Y.C., de Menezes, M.N., Anderson, R.J., Draper, S.L., Compton, B.J., Chan, S.T.S., Mathew, J., Li, J., Kedzierski, L., Wang, Z., Beattie, L., Enders, M.H., Ghilas, S., May, R., Steiner, T.M., Lange, J., Fernandez-Ruiz, D., Valencia-Hernandez, A.M., Osmond, T.L., Farrand, K.J., Seneviratna, R., Almeida, C.F., Tullett, K.M., Bertolino, P., Bowen, D.G., Cozijnsen, A., Mollard, V., McFadden, G.I., Caminschi, I., Lahoud, M.H., Kedzierska, K., Turner, S.J., Godfrey, D.I., Hermans, I.F., Painter, G.F., and Heath, W.R., (2020) Glycolipid-peptide vaccination induces liver-resident memory CD8(+) T cells that protect against rodent malaria. *Sci Immunol*. **5**: eaaz8035

[8]. Goodman, C.D., Uddin, T., Spillman, N.J., and McFadden, G.I., (2020) A single point mutation in the Plasmodium falciparum FtsH1 metalloprotease confers actinonin resistance. *Elife*. **9**: e58629

[9]. Dungan, A., Hartman, L., Tortorelli, G., Belderok, R., Lamb, A., Pisan, L., McFadden, G., Blackall, L., and van Oppen, M., (2020) *Exaiptasia diaphana* from the Great Barrier Reef: a valuable resource for coral symbiosis research. *Symbiosis*. **80**: 195-206

[10]. Burns, A.L., Sleebs, B.E., Siddiqui, G., De Paoli, A.E., Anderson, D., Liffner, B., Harvey, R., Beeson, J.G., Creek, D.J., Goodman, C.D., McFadden, G.I., and Wilson, D.W., (2020) Retargeting azithromycin analogues to have dual-modality antimalarial activity. *BMC Biol*. **18**: 133

[11]. Biddau, M., Kumar, T., Henrich, P., Laine, L., Blackburn, G., Achuthanunni, C., RTao, B., Kim, L., Hoffman, S., Barrett, M., Coombs, G., McFadden, G., Fidock, D., Muller, S., and Sheiner, L., (2020) Lipoic acid biosynthesis is essential for *Plasmodium falciparum* transmission and influences redox response and carbon metabolism of parasite asexual blood stages. *Int. J. Parasitol*,

[12]. Amiar, S., Katris, N., Berry, L., Dass, S., Shears, M.J., Brunet, C., Touquet, B., Hakimi, M.-A., McFadden, G.I., Yamaryo-Botte, Y., and Botte, C.Y., (2020) Division and adaptation to host nutritional environment of apicomplexan parasites depend on apicoplast lipid metabolic plasticity and host organelles remodelling. *Cell Rep*. **300**: 3778-3792. e9