



Curriculum Vitae

Personal information

First name / Family name	Dorrain / Low		
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Telephone	NIL		
Mobile	+61432148823, +6591252068		
E-mail	dorrain.low@uqconnect.edu.au		
Nationality	Singapour		
Date of birth	23/12/1988		
Gender	Female		

Personal statement and statement of intent

Using a combination of human mastication, digestion and fermentation simulations, and dietary intervention trials (using pigs as a human model), my work has provided insights to the role of food structure and mastication to impede on nutrient bioaccessibility, and that undigested/trapped nutrients are transported to the large intestine for further sequential processing, leading to elucidating gut microbial-mediate polyphenol biotransformations and metabolite profiling. This work also led to an investigation of phenolic metabolism along the entire length of the gastrointestinal tract (in pigs) to identify *in vivo* metabolites in real-time passage, as well as biomarkers in circulating plasma and urinary excretion profiles.

As such, I have developed an expertise that focused on applying chromatographic and mass spectrometric methods to the identification of carotenoids, polyphenols and secondary metabolites in plant and digesta matrices using untargeted metabolomics. I have acquired an understanding of the role of plant cell wall structures in influencing the site of phytonutrient metabolism and production of secondary/microbial metabolites, which have been recently recognised for their intrinsic bioactivity relative to the ingested precursor compounds. Hence, I have garnered a strong interest in the application of nutrition to managing health and/or diseased states including vascular and/or oxidative stress and neuroinflammation, and the effects of dietary phytonutrients (i.e., polyphenols) on cognition/memory. I want to be able to extend my analytical expertise to human health and especially the significance of metabolite biomarkers in diseased states within an individual.

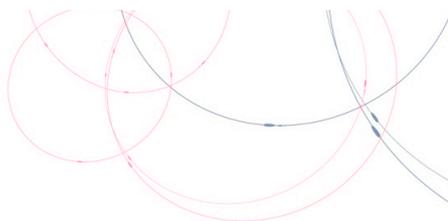
The AgreenSkills Fellowship represents a valuable opportunity for me as a young researcher to work with the Human Nutrition Unit at INRA, which has strong expertise and methodological platforms for studying nutritional metabolomics. The proposed mobility project will be a building platform to leverage my strong understanding of the inter-relationships between food intake/exposure, nutrient metabolism and human physiology to the aetiology of cognitive decline, neuronal loss and neuroplasticity using an exploratory omics approach.

In the proposed mobility project, I aim to scrutinise the associations between dietary intake (of plant food rich diets) and neuronal integrity,

	<p>which will allow me to identify discriminating combinations of bioactive plant metabolites in individuals with accelerated cognition decline vs individuals with preserved cognition (Three-cities cohort of French older subjects). An award of the mobility fellowship for 24 months would allow me to go deeper in the study of the effect of age and gender on individual exposure to these metabolites shown to have a beneficial effect on cognition in a separate intervention trial (COB study) involving young and older men and women. I believe the findings from this mobility project will open new avenues for nutritional recommendations in the context of prevention and treatment of age-related diseases i.e., Alzheimer's disease, particularly since diet is a modifiable risk factor.</p> <p>The metabolomics profiles of the plant bioactives and their metabolites studied in these human trials that are associated with preserved cognition will be deposited in an in-house databank, adding value to the development of a comprehensive food metabolome, which will benefit the international research community. Monoisotopic masses, relevant spectral data and dietary origin will be extensively compiled, and when information is missing, their most likely metabolites will be predicted with <i>in silico</i> tools. This databank will facilitate a more effective screening of metabolomics profiles, especially since identification of discriminating compounds is a major challenge due to generated features showing hundreds of possible elemental formulae and the lack of available databases to reduce the number of potential elemental formulae. My relevant proficiency in various data acquisition, processing and multivariate statistics will contribute positively towards the mobility project methodology. Additionally, my skills with the integration of large complex raw datasets, and translating them into visual interpretations for an easier understanding would enable me to pick up the Workflow4metabolomics infrastructure (metabolomics integration platform) relatively quickly.</p>
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Education and training

Location and dates	The University of Queensland St Lucia, Brisbane, QLD 4072, Australia 08/07/2011-05/06/2015
Title of qualification awarded	PhD in Food and Nutritional Sciences
Principal subjects/occupational skills covered	<p>PhD title: Phytonutrient bioaccessibility and metabolism <i>in vitro</i> and <i>in vivo</i>. This thesis focused on studying the effects of sequential digestive processing of cellular macronutrients and phytonutrients in mango and banana flesh using <i>in vitro</i> laboratory and <i>in vivo</i> (pig feeding trial) approaches. As such, I have developed an area of expertise during my PhD that focused on applying chromatographic and mass spectrometric methods to the identification of carotenoids, polyphenols and (secondary) metabolites in plant and biological matrices.</p> <p>Specific acquired techniques are listed:</p> <ul style="list-style-type: none"> • UPLC-PDA, UHPLC-Q-ToF-MS • Targeted and non-targeted metabolomics and compound identification • Data acquisition and processing softwares (MassHunter, MassLynx, Empower) • Multivariate softwares (SAS, Minitab, SIMCA) • Polyphenol-biotransformations and secondary metabolites • Integration and extrapolation of large complex datasets • Confocal microscopy • Solvent and solid-phase extraction skills (carotenoids and



	<p>polyphenols) from plant tissues and biological samples (saliva, digesta, faeces, blood, urine)</p> <ul style="list-style-type: none"> • Developed a human mastication experiment and human ethics submission (as chief investigator) • Developed a pig intervention trial and animal ethics submission (as associate investigator) • Caco-2 cell culture and permeability assay • Dissection and anatomical skills
Name of Institute	The University of Queensland

Location and dates	<p>The University of Queensland St Lucia, Brisbane, QLD 4072, Australia 01/08/2008-21/07/2010</p>
Title of qualification awarded	Bachelor of Applied Science (Honours Class 1)
Principal subjects/occupational skills covered	<p>While undertaking the research coursework in my Honours year, I also took up additional courses in research methods for biophysical science and postgraduate advanced topics.</p> <p>Honours project title: Volatile fingerprinting of Tasmanian leatherwood honey. This project studied the chemical composition of leatherwood honey sourced from different geographical locations throughout Western Tasmania, and characterised a spectrum of volatile floral source descriptors to generate a fingerprint representative of the collected honeys from their respective locations. The collective combination of GCMS and PCA was an effective technique in the chemical authentication of the floral source of leatherwood honeys for the domestic (Australian) and international markets.</p> <p>Specific acquired techniques are listed:</p> <ul style="list-style-type: none"> • GC-MS/MS • Targeted and non-targeted GC analysis and compound identification • Data acquisition and processing software (LabSolutions) • Chemometric and regression analysis (Minitab) • Solvent extraction of volatiles
Name of Institute	The University of Queensland

Location and dates	<p>Temasek Polytechnic 21 Tampines Ave 1, Singapore 529757 18/04/2005-20/04/2008</p>
Title of qualification awarded	Diploma in Food Science and Nutrition
Principal subjects/occupational skills covered	<p>Some of the principal subject areas are listed:</p> <ul style="list-style-type: none"> • Cellular Biochemistry in Health • Nutrition in Disease • Food Structure and Sensory Science • Physical Activity and Health • Advanced Food Science • Nutrition Across the Life Span • Principles of Biochemistry and Physiology for Nutrition • Food Product Development • Food Safety • Food Processing • Nutrition in Health and Disease • Chemical Food Analysis • Food Microbiology I • Food Microbiology II • Major project
Name of Institute	Temasek Polytechnic

Work experience

Location and dates	Australia Catholic University 1100 Nudgee Road, Banyo, QLD 4014, Australia 29/02/2016-01/08/2016
Occupation or position held	Academic (casual)
Main activities and responsibilities	<p>My main responsibilities include teaching and facilitating Human Biological Sciences (anatomy, physiology and pathophysiology) to first year undergraduate students. Main responsibilities include 'mini'-lectures, demonstrations, dissections, engaging group interactions, clinical case studies using the patho-triangle and interactive in- and out of-class activities to highlight weekly key concepts. I was also actively involved in marking of assignments and examination, and assisting in electronic course management.</p> <p>A short description of courses taught: BIOL121, BIOL125: Principles of human anatomy and physiology of various body systems including structures in relation to healthy body functions, maintenance of homeostasis and introduction to pharmacology. BIOL122: Extension of physiology to pathophysiology and pharmacology in key National Health Priority areas and lifespan biology with a strong emphasis on aetiology, pathogenesis, clinical manifestations and pharmacological management of atherosclerosis, coronary heart diseases, thrombosis, strokes, obesity, hypertension, inflammation, diabetes mellitus, asthma, respiratory infections, fractures, osteoporosis/osteoarthritis, disorders of the central nervous system, addiction and cancer.</p>
Name of employer	School of Science, Australia Catholic University

Location and dates	The University of Queensland St Lucia, Brisbane, QLD 4072, Australia 01/08/2012-30/11/2014
Occupation or position held	Academic (casual)
Main activities and responsibilities	<p>My main responsibilities include teaching and facilitating Food Chemistry and Analysis to third year undergraduate and Masters students, where I provided guidance to students in intensive experimental work and analytical techniques using real food systems, constructing calibration curves for quantification. I also advised them on writing scientific reports and marked their weekly lab reports. As such, I have developed excellent interpersonal skills including interacting with individuals and large-scale practicals.</p> <p>A short description of courses taught: CHEM2003/FOOD7013: Chemistry, structure, reaction and interactions of food components (proteins, carbohydrates, lipids, enzymes, vitamins, minerals, flavour compounds). Identification, characterisation and quantification of food components using chemical and analytical techniques.</p>
Name of employer	School of Agriculture and Food Sciences, The University of Queensland

Location and dates	The University of Queensland St Lucia, Brisbane, QLD 4072, Australia
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	01/04/2014-30/06/2014
Occupation or position held	Team member in a dietary intervention trial in grower pigs (3 months)
Main activities and responsibilities	I was involved as an experienced team member, in a pig intervention study looking at the influence of soluble fibres on pre- and postprandial glucose tolerance over a 3 h period, and effect of habituation in facilitating the collection of plasma samples from the jugular vein.
Name of employer	Centre for Nutrition and Food Sciences, The University of Queensland

Location and dates	The University of Queensland St Lucia, Brisbane, QLD 4072, Australia 01/08/2011-30/10/2015
Occupation or position held	Team member in a dietary intervention trial in grower pigs (24 months)
Main activities and responsibilities	As one of the associate investigators, I participated actively in the planning, experimental design (pigs, diet composition, feeding, dietary markers) of a pig feeding trial using grower pigs as a human model, including euthanasia, sampling and processing of various body sites, biological fluids. Through this, I have gained extensive experience on animal ethics standard and ethics submission to the Production and Companion Animals Committee.
Name of employer	Centre for Nutrition and Food Sciences, The University of Queensland

Location and dates	The University of Queensland St Lucia, Brisbane, QLD 4072, Australia 01/08/2011-30/10/2015
Occupation or position held	Chief investigator of human mastication trial
Main activities and responsibilities	I developed and established a mastication trial involving human volunteers and studying their individual mastication profiles. During this period, I have accumulated a high level of understanding of participant recruitment, human ethics standards and experience in ethics submission to the Human Research Ethics Committee.
Name of employer	Centre for Nutrition and Food Sciences, The University of Queensland

Location and dates	Pizza Hut Pte Ltd (Head Office) 17 Kallang Junction, #01-01 Esmart Centre, Singapore 339274 01/09/2010-30/05/2011
Occupation or position held	R&D Executive
Main activities and responsibilities	In this role, I independently handled projects on modifying ingredients in existing menu products, and innovating new products: pizza dough, pizza flavours, appetisers, western mains, desserts and chilled beverages. I also conducted sensory sessions for evaluations of new/modified products (using an internal panel of 10-120 assessors and consumer-based research on product acceptability and preference). I was also involved in preparing specification charts to roll out to stores for launch, training to managers and store checks for quality assurance.
Name of employer	Pizza Hut Pte Ltd

Location and dates	Nestlé R&D Centre 129 Quality Road, Singapore 618802 04/2007-07/2007
Occupation or position held	Student intern
Main activities and responsibilities	I had the opportunity to take charge of a flavour project, where I monitored and validated the release criteria for production of a new flavour compound in the R&D lab. I was also involved in the identification, analytical and microscopic analyses of solid and liquid food ingredients in the Food Science and Quality Assurance department. Additionally, I learned to conduct sensory evaluations with a trained consumer panel in the Culinary department (using a computer-based sensory evaluation system).
Name of employer	Nestlé R&D Centre

Languages

Mother tongue(s)	<i>English</i>				
Other language(s)	Understanding		Speaking		Writing
<i>European level (*)</i>	Listening	Reading	Spoken interaction	Spoken production	
<i>Chinese</i>	C1	C1	C1	C1	C1
<i>French</i>	A1	A1	A1	A1	A1
	(*) <i>Common European Framework of Reference for Languages</i> http://europass.cedefop.europa.eu/en/resources/european-language-levels-cefr				

Academic Record

Publications	<p>Accepted, in press and published articles / papers:</p> <p>LOW, D. Y., HODSON, M. P., WILLIAMS, B. A., D'ARCY, B. R. & GIDLEY, M. J. (2016). Microbial transformation of polyphenols during in vitro colonic fermentation of masticated mango and banana. <i>Food Chemistry</i>, 207, 214-222.</p> <p>(As first author, Low, D designed the experiment, performed experimental work, data processing, statistical analysis, identification of compounds, interpretation of results and drafted the manuscript. Hodson, M contributed to Q-ToF-MS analysis, extraction of raw MS data, consultation of statistical analysis, data interpretation and critical revision of manuscript. Williams, B, D'Arcy, B and Gidley, M contributed to experimental design, data interpretation and provided critical revision of the manuscript.)</p> <p>LOW, D. Y., WILLIAMS, B. A., FLANAGAN, B. M., D'ARCY, B. R. & GIDLEY, M. J. (2015). <i>In vitro</i> fermentation of chewed mango and banana tissue: Particle size, starch and vascular fibre effects. <i>Food & Function</i>, 6, 2464-2474.</p> <p>(As first author, Low, D designed the experiment, performed most experimental work, data processing, statistical analysis, interpretation of results and drafted the manuscript. Williams, B contributed towards consultation of experimental design, statistical analysis, data interpretation and critical revision of manuscript. Flanagan, B contributed to NMR analysis and data interpretation of NMR results. D'Arcy, B provided critical revision of manuscript. Gidley, M contributed</p>
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	<p>to experimental design, data interpretation and provided critical revision of the manuscript.)</p> <p>LOW, D. Y., D'ARCY, B., & GIDLEY, M. J. (2015). Mastication effects on carotenoid bioaccessibility from mango fruit tissue. <i>Food Research International</i>, 67, 238-246. (As first author, Low, D designed the experiment, established the chewing trial, performed experimental work, data processing, statistical analysis, identification of compounds, interpretation of results and drafted the manuscript. D'Arcy, B and Gidley, M contributed to experimental design, data interpretation and provided critical revision of the manuscript.)</p> <p>LOW, D. Y., WILLIAMS, B. A., NETZEL, G. A., NETZEL, M., D'ARCY, B. R. & GIDLEY, M. J. (2014). Polyphenol fermentation and metabolism <i>in vitro</i>. In: Polyphenols Communications 2014. (As first author, Low, D drafted the conference abstract and proceeding. Williams, B, Netzel, G, Netzel M, D'Arcy, B and Gidley, M all contributed towards critical revision of the poster.)</p> <p>LOW, D. Y. & GRANT, L. (2014). More than a gut feeling. <i>Food Australia</i>, Feb 2014, 32-35. (Both authors shared equal contributions to the publication.)</p>
	<p>Submitted publications:</p> <p>NIL</p> <p>(LOW, D. Y., PLUSCHKE, A., GERRITS, W., GIDLEY, M. & WILLIAMS, B. (2016). <i>Passage of gastrointestinal contents in grower pigs as affected by dietary components. Manuscript in advanced preparation</i>)</p> <p>(LOW, D. Y., PLUSCHKE, A., GERRITS, W., GIDLEY, M. & WILLIAMS, B. (2016). <i>Total GIT analysis of cereal fibre effects on pigs' digesta. Manuscript in advanced preparation</i>)</p> <p>(LOW, D. Y., WILLIAMS, B., ZHANG, D., LISLE, A., GERRITS, W., MIKKELSEN, D., KEATES, H. & GIDLEY, M. (2016). <i>Soluble fibres act independently in terms of digesta. Manuscript in advanced preparation</i>)</p>
<p>Conference presentations</p>	<p>26th International Conference on Polyphenols & 8th Tannin Joint Conference, Nagoya, Japan, September 2014 (<i>Poster presentation</i>).</p> <p>6th International Symposium on Fruit and Vegetables for Human Health, International Horticulture Congress, Brisbane, August 2014 (<i>Oral presentation</i>).</p> <p>Nutrition Society of Australia & Nutrition Society of New Zealand Annual Scientific Meeting, Brisbane, December 2013 (<i>Oral presentation</i>).</p> <p>AIFST Food Science Summer School, Sydney, NSW, February 2013 (<i>Oral presentation</i>).</p> <p>AIFST Food Science Summer School, Melbourne, Victoria, February 2012 (<i>Poster presentation</i>).</p>
<p>Graduate teaching as lecturer or training coordinator</p>	<p>Graduate teaching (01/08/2015-01/11/2015): I took on a teaching/tutoring role to Masters students undertaking Food</p>

	Science and Nutrition/Technology in the School of Agriculture and Food Sciences, The University of Queensland, as part of the Australia's Aid Program. The topics covered include chemistry, structure, biological function, analytical techniques and applications to food processing of major macronutrients in food systems- proteins, carbohydrates and lipid including aroma and flavour volatiles produced during chemical reactions, i.e. Millard reaction.
Awards and prizes, if any	ARC Centre of Excellence PhD Scholarship ARC Centre of Excellence Top Up Scholarship UQI Tuition Fee Award Dean's Commendation for High Achievement (Semester 1, 2009) Dean's Commendation for High Achievement (Semester 2, 2008)

Collaboration and Networking

Partnerships or experience with industry	An industry collaboration with KFSU, Australia on a sensory project involving the incorporation of an added fibre ingredient to be potentially rolled out as a commercial project.
Graduate teaching as lecturer or training coordinator; PhD supervision	Research supervision (01/06/2013-30/09/2014): I took on a primary supervisory role to an Honours undergraduate student and an occupational trainee (from the <i>Institut Polytechnique Laselle Beauvais</i>) doing their research projects at the Centre of Nutrition and Food Sciences, The University of Queensland. I was involved in steering them the administrative procedures, mentoring them in a research lab environment and writing a scientific report. I highly encouraged their critical thinking and planning skills as I am aware that student independence and research integrity are imperative to a career in research and academia.
Membership of professional bodies and committees	Australian Institute of Food Science and Technology Nutrition Society of Australia International Society for Horticultural Science Women in Technology

Research management, Technology transfer, and Communication

Other experience and skills relevant to the application	<p>Proficient software experiences:</p> <ul style="list-style-type: none"> • MassHunter Workstation • Empower • SIMCA • Minitab • SAS • Microsoft office suite <p>Workshops attended:</p> <ul style="list-style-type: none"> • Stable isotope workshop (by Prof Michael Rychlik from TUM) • Seven secrets of highly successful research students, UQ • Communicating your research in the media, UQ • Grant writing for bio, biotech and life sciences (ARC), UQ • Essential knowledge for research management, UQ • Research animal workshop, UQ • Microscopy @ UQ Symposium, UQ • Pig handling workshop, Gatton Campus Piggery, Gatton • Working with biological material, UQ <p>Volunteer experiences:</p>
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	<ul style="list-style-type: none"> • Delegate at the International Horticulture Congress • Delegate at ILSI SEAR Australasia Gut Microbiota Symposium • Coordinated and participated in multiple sensory evaluations (consumer-based research in terms of acceptability and ranking tests for industrial collaborations, and as a trained panellist in sensory descriptive tests for developing sensory lexicons) • Participant in Singapore Food Manufacturer's Association Food Product Concept Competition • Participant in clinical study of blood glucose response for development of white bread with low glycemic index and healthier choice symbol • Event helper at Tan Tock Seng Hospital, Singapore
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Scientific References

Full name	Prof. Michael Gidley
Position	Director
Institution	Centre for Nutrition and Food Sciences, Queensland Alliance for Agriculture and Food Innovation and, Chief Investigator, ARC Centre of Excellence in Plant Cell Walls, The University of Queensland, St Lucia, Brisbane, QLD 4072, Australia
Email address	m.gidley@uq.edu.au

Full name	Dr Mark Hodson
Position	Senior Research Fellow and node manager
Institution	Metabolomics Australia (Queensland node), Australian Institute for Bioengineering and Nanotechnology and, Affiliate Research Fellow in School of Pharmacy, Faculty of Health and Behavioural Sciences, The University of Queensland, St Lucia, Brisbane, QLD 4072, Australia
Email address	m.hodson1@uq.edu.au

Full name	Dr Barbara Williams
Position	Senior Research Fellow
Institution	Centre for Nutrition and Food Sciences, Queensland Alliance for Agriculture and Food Innovation, The University of Queensland, St Lucia, Brisbane, QLD 4072, Australia
Email address	b.williams@uq.edu.au

How did you hear about AgreenSkills programmes?

	<i>I heard about the Agreenskills outgoing fellowship programme through a job advertisement.</i>
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