

Curriculum Vitae: Owain Rhys Edwards B.Sc., M.Sc., Ph.D., GAICD

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Birthdate: 19 Jun 1963
Birthplace: Holyhead, Wales, U.K.
Nationalities: Australian, Canadian, British

1. CURRENT APPOINTMENTS and POSITIONS:

- **Group Leader, *Environmental Genomics* & Senior Principal Research Scientist** 2014-present
CSIRO Land & Water Flagship Perth, WA, Australia

Previous CSIRO Leadership Roles:

- **Research Program Leader, *Evolutionary Biology* (CSIRO Ecosystem Sciences, CES)** 2012-2014
- **Research Program Leader, *Environmental Biotechnology & Genomics* (CES)** 2010-2014
- **Research Group Leader, *Genomics* (CES)** 2008-2010
- **Research Program Leader, *Invertebrate Genomics & Evolution* (CEnto)** 2006-2008

- **Grains Pest Advisory Committee** 2013-present
Grains Research and Development Corporation (GRDC) Canberra, ACT, Australia

- **National Insecticide Resistance Management Committee** 2013-present
Grains Research and Development Corporation (GRDC) Canberra, ACT, Australia

- **Technical Committee (RNAi)** 2014-present
SITPlus Consortium, Horticulture Innovation Australia (HIA) Sydney, NSW, Australia

- **Editorial Board** 2014-present
PLoS One Journal San Francisco, CA, USA

- **Co-ordinating Group** 2011-present
i5K 5000 Insect Genome Initiative USDA-ARS, Washington DC, USA

- **Scientific Committee, Asia-Pacific Co-ordinator** 2010-present
International Symposium on Molecular Insect Science Amsterdam, Netherlands

- **Board Member (Asia-Pacific)** 2009-present
International Aphid Genomics Consortium (IAGC) Rennes, France

2. EDUCATION & QUALIFICATIONS:

- **Leading the Research Enterprise (LRE)** 2011
Australian Graduate School of Management, UNSW Sydney, NSW, Australia

- **GAICD** 2009
Australian Institute of Company Directors Perth, WA, Australia

- **Doctor of Philosophy** 1989-1994
Department of Environmental Biology, University of California-Berkeley Berkeley, CA, USA

- **Master of Science** 1987-1989
Department of Entomology and Plant Pathology, University of Missouri Columbia, MO, USA

- **Bachelor of Science** 1981-1986
Department of Zoology, University of Guelph Guelph, ONT, Canada

3. AWARDS (last 5 years):

- 2010:** CSIRO Newton-Turner Award for career science excellence
2009: CRC for National Plant Biosecurity Science Impact Award (highest impact paper)

4. SPONSORED INVITATIONS (last 5 years):

- 2015:** International Atomic Energy Association (FAO, UN) Genetic Control of Fruit Flies Workshop
2013: Entomological Societies of Canada and Ontario 150th Anniversary (Plenary), Guelph, Canada
2012: International Congress of Entomology, Daegu, Korea.
2012: Seoul National University, Seoul, Korea
2011: Entomological Society of America Conference, Reno, USA
2011: International Symposium on Molecular Insect Sciences, Amsterdam, Netherlands
2011: University of California-Riverside, Riverside, CA, USA
2011: Arthropod Genomics Symposium, Kansas City, USA
2011: Social Insects Genomics Conference, Shenzhen, China
2011: TEDx “Ideas Worth Spreading”, Perth, WA, Australia
2011: Cotton Aphid Genomics Symposium, Shanghai, China
2010: International *Bemisia* Research Symposium, Hangzhou, China
2010: International Russian Wheat Aphid Workshop, Singapore

5. MAJOR RESEARCH GRANTS (Last 5 years):

Global invasion genetics of *Myzus persicae* (2014-present)

Funding: Horticulture Australia, Grains Research and Development Corporation (Australia), \$175K
 Collaborators: University of Melbourne
 Chinese Academy of Sciences
 Volcani Center, Israel
 Rothamsted Research, UK
 INRA Rennes, France
 Cornell University

Dietary Sterilization of male Queensland Fruit Fly using RNAi (QFF) (2013-present)

Funding: Horticulture Australia, \$2.4M
 Collaborators: University of New South Wales
 University of Adelaide
 South Australia Research and Development Institute
 Macquarie University

Dissecting Adaptive Potential with Transcriptomics (2012-present)

Funding: CSIRO Transformational Biology TCP (Australia) \$1.5M
 Collaborators: University of Melbourne
 University of Queensland
 International Center for Genetic Engineering and Biotechnology (India)
 International Agricultural Research Institute (India)
 National Research Centre on Plant Biotechnology (India)

Crop Plants with their own Biotic Defences (2012-present)

Funding: DIISR (Australia) \$6.3M

Collaborators: University of Melbourne
University of Queensland
International Center for Genetic Engineering and Biotechnology (India)
International Agricultural Research Institute (India)
National Research Centre on Plant Biotechnology (India)

Global Environmental Assessment Initiative (GEAI), Biodiversity Genomics (2011-present)

Funding: SIEF (Australia) \$1.5M

Collaborators: Curtin University of Technology
University of Western Australia
Department of Environment and Conservation, WA
Atlas of Living Australia
BGI Shenzhen (China)

Jack Jumper Ant Genome Project (2010-present)

Funding: CSIRO (Australia), NERC (UK)

Collaborators: Australian National University
National Institute of Genetics (Japan)
University of Reading (UK)
BGI Shenzhen (China)

Insecticide Resistance Diagnostics and Management Projects (2010-present)

Funding: Grains Research and Development Corporation (3 projects, \$1.4M total)

Collaborators: University of Melbourne
University of Western Australia
Department of Agriculture and Food, WA

6. PEER REVIEWED PUBLICATIONS (Last 10 years):

1. Clouston A, **Edwards OR**, Umina PA. Pesticide sensitivities in Australian populations of key broadacre aphids. *Crop and Pasture Science*, under review.
2. Brisson JA, Welch M, Chaffee ME, Walsh T, Jaubert-Possamai S, Legeai F, Hudaverdian S, Schultz M, Ecker J, Lister R, Tagu D, **Edwards OR**. Pea aphid epigenomes reveal methylation variation between morphs and between gene paralogs. *Proceedings of the Royal Society*, under review.
3. Wang W, Zhang Y, Dai H, Chandrasekar R, Hiromasa Y, Peng G, Chen S, Tomich JM, Reese J, **Edwards OR**, Reeck GR. (2015). The protein Armet (MANF) is responsive to endoplasmic reticulum stress in insects. *FASEB Journal*, in press
4. Park D, Jung JW, Choi B-M, Jayakodi M, Lee J, Lim J, Yu Y, Choi Y-S, Lee M-L, Park Y, Choi I-Y, **Edwards OR**, Nah G, Kwon HW. 2015. Uncovering the novel characteristics of Asian honey bee (*Apis cerana*) by whole genome sequencing. *BMC Genomics* 16:1.
5. Umina PA, **Edwards O**, Carson P, van Rooyen A, Anderson A. 2014. High levels of resistance to carbamate and pyrethroid chemicals widespread in Australian *Myzus persicae* (Hemiptera: Aphididae) populations. *J. Econ. Entomol.* 107: 1626-1638.

6. Zhang B, **Edwards OR**, Fuller S, Kang L. 2014. A multi-genome analysis approach enables tracking of the invasion of a single Russian wheat aphid (*Diuraphis noxia*) clone throughout the New World. *Molecular Ecology* 23: 1940-1951.
7. Zhang B, Ma C, **Edwards O**, Fuller S, Kang L. 2014. The mitochondrial genome of the Russian wheat aphid *Diuraphis noxia*: Large repetitive sequences between *trnE* and *trnF* in aphids. *Gene* 533: 253-260.
8. i5K Consortium. 2013. The i5K initiative: Advancing arthropod genomics for knowledge, human health, agriculture, and the environment. *Journal of Heredity* 104: 595-600.
9. Didham RK, **Edwards OR**, Leather SR, Basset Y. 2013. Arthropod diversity and the future of all-taxa inventories. *Insect Conservation and Biodiversity* 6: 1-4.
10. Rathe AA, Pilkington LJ, Gurr GM, Hoddle MS, Daugherty MP, Constable FE, Luck JE, Powell KS, Fletcher MJ, **Edwards OR**. 2012. Incursion preparedness: anticipating the arrival of an economically important plant pathogen *Xylella fastidiosa* Wells (Proteobacteria: Xanthomonadaceae) and the insect vector *Homalodisca vitripennis* (Germar) (Hemiptera: Cicadellidae) in Australia. *Aus. J. Entomology*, 51:209-220.
11. Adhikari KN, **Edwards OR**, Wang SF, Ridsdill-Smith TJ, Buirchell B. 2012. The role of alkaloids in conferring aphid resistance in yellow lupin (*Lupinus luteus* L.). *Crop & Pasture Science* 63: 444-451.
12. Guo S, Kamphuis LG, Gao LL, Klingler JP, Lichtenzveig J, **Edwards OR**, Singh KB. 2012. Identification of distinct quantitative trait loci associated with defence against the closely related aphids *Acyrtosiphum pisum* and *A. kondoi* in *Medicago truncatula*. *Journal of Experimental Botany*, 63: 3913-3922.
13. Zhang B, **Edwards OR**, Kang L, Fuller S. 2012. Russian wheat aphids (*Diuraphis noxia*) in China: Native range expansion or recent introduction? *Molecular Ecology*, 21: 2130-2144.
14. Cui F, Smith CM, Reese J, **Edwards OR**, Reeck G. 2012. Polymorphisms in salivary-gland transcripts of Russian wheat aphid biotypes 1 and 2. *Insect Science*, 19: 429-440.
15. **Edwards OR**, Papanicolaou A. 2012. A roadmap for whitefly genomics: Lessons from previous insect genome projects. *Journal of Integrative Agriculture*, 11:269-280.
16. Lu H-L, Tanguy S, Rispe C, Gauthier J-P, Walsh T, Gordon K, **Edwards OR**, Tagu D, Chang C-C, Jaubert-Possamai S. 2011. Expansion of genes encoding piRNA-associated proteins in the pea aphid: Diversification of expression profiles in different plastic morphs. *PLoS One*: 328051.
17. Jimoh MA, Botha CEJ, **Edwards OR**. 2011. Russian wheat aphid biotype RWASA2 causes more vascular disruption than RWASA1 on resistant barley lines. *S. Afr. J. Botany* 77: 755-766.
18. Carolan JC, Caragea D, Reardon KT, Mutti NS, Pappan K, Dittmer N, Cui F, Reeck GR, Castaneo M, Wincker P, Dossat C, Wilkinson TL, Tagu D, Reese JC, **Edwards OR**. 2011. Aphids as plant pathogens: Predicted effector molecules and their evolution in the salivary secretome of the pea aphid (*Acyrtosiphon pisum*). *Journal of Proteome Research* 10: 1505-1518.
19. Jimoh MA, Botha CEJ, **Edwards OR**, Bradley G. 2011. Population growth rate and relative virulence of two South African biotypes of Russian wheat aphid, *Diuraphis noxia* (Mordvilko) and bird cherry aphid, *Rhopalosiphum padi* L. on barley (*Hordeum vulgare* L.) cultivars. *Entomologia Experimentalis et Applicata* 138: 12-20.
20. Liu X, Marshall JL, Stary P, **Edwards OR**, Puterka G, Dolatti L, El Bouhssini M, Malinga J, Lage J, Smith CM. 2010. Global phylogenetics of an invasive aphid species: Evidence for multiple invasions into North America. *Journal of Economic Entomology* 103: 958-965.
21. The International Aphid Genomics Consortium. 2010. Genome Sequence of the Pea Aphid *Acyrtosiphon pisum*. *PLoS Biology* 8: e1000313.
22. Legeai F, Rizk G, Walsh T, **Edwards OR**, Gordon K, Lavenier D, Leterme N, Mereau A, Nicolas J, Tagu D, Jaubert-Possamai S. 2010. Bioinformatic prediction, deep sequencing of microRNAs and expression analysis during phenotypic plasticity in the pea aphid, *Acyrtosiphon pisum*. *BMC Genomics* 11: 281.

23. Walsh T, Brisson J, Jaubert-Possamai S, Tagu D, Gordon K, **Edwards OR**. 2010. A functional DNA methylation system in the pea aphid, *Acyrtosiphon pisum*. *Insect Molecular Biology* 19: 215-228.
24. Jaubert-Possamai S, Rispe C, Tanguy S, Gordon K, Walsh T, **Edwards OR**, Tagu D. 2010. Expansion of the miRNA pathway in the hemipteran insect *Acyrtosiphon pisum* is the first such observation in the Metazoa. *Molecular Biology and Evolution* 27(5):979-987.
25. Gao L-L, Kamphuis LG, Kakar K, **Edwards OR**, Udvardi, MK, Singh KB. 2010. Identification of potential early regulators of aphid resistance in *Medicago truncatula* via transcription factor expression profiling. *New Phytologist* 186: 980-994.
26. Klingler JP, Nair RM, **Edwards OR**, Singh KB. 2009. A single gene, AIN, in *Medicago truncatula* mediates a hypersensitive response to both bluegreen aphid and pea aphid, but confers resistance only to bluegreen aphid. *Journal of Experimental Botany* 60: 4115-4127.
27. Guo S, Kamphuis LG, Gao L, **Edwards OR**, Singh KB. 2009. Two independent resistance genes in the *Medicago truncatula* cultivar jester confer resistance to two different aphid species of the genus *Acyrtosiphon*. *Plant Signaling and Behavior* 4: 328-331.
28. Gao LL, Klingler JP, Anderson JP, **Edwards OR**, Singh KB. 2008. Characterization of pea aphid resistance in *Medicago truncatula*. *Plant Physiology* 146: 996-1009.
29. Gu H, **Edwards OR**, Hardy AT, Fitt GP. 2008. Host plant resistance in grain crops and prospects for invertebrate pest management in Australia: an overview. *Aust J Exp Agr* 48: 1543-1548.
30. **Edwards OR**, Franzmann B, Thackray D, Micic S. 2008. Insecticide resistance and implications for future aphid management in Australian grains and pastures: a review. *Aust J Exp Agr* 48: 1523-1530.
31. Furlong MJ, Spafford H, Ridland PM, Endersby NM, **Edwards OR**, Baker GJ, Keller MA, Paul CA. 2008. Ecology of diamondback moth in Australian canola: landscape perspectives and implications for management. *Aust J Exp Agr* 48: 1494-1505.
32. Gao LL, Horbury R, Nair RM, Singh KB & **Edwards OR**. 2007. Characterisation of resistance to multiple aphid species in *Medicago truncatula*. *Bulletin of Entomological Research* 97: 41-48.
33. Klingler JP, **Edwards OR**, & Singh KB. 2007. Independent action and contrasting phenotypes of resistance genes against spotted alfalfa aphid and bluegreen aphid in *Medicago truncatula*. *New Phytologist* 173: 630-640.
34. Gao LL, Anderson JP, Klingler J, **Edwards OR** & Singh KB. 2007. Involvement of the octadecanoid pathway in bluegreen aphid resistance in *Medicago truncatula*. *Molecular Plant Microbe Interactions* 20: 82-93.
35. Cardoza YJ, Wang SF, Reidy-Crofts J & **Edwards OR**. 2006. Phloem alkaloid tolerance allows feeding on resistant *Lupinus angustifolius* by the aphid *Myzus persicae*. *Journal of Chemical Ecology* 32: 1965-1976.
36. Cotter, SC & **Edwards OR**. 2006. Quantitative genetics of preference and performance on chickpeas in the noctuid moth, *Helicoverpa armigera*. *Heredity* 96: 396-402.
37. **Edwards OR** & KB Singh. 2006. Resistance to insect pests: What do legumes have to offer? *Euphytica* 147: 273-285.
38. Cardoza YJ, Reidy-Crofts J & **Edwards OR**. 2005. Differential inter- and intra-specific defense induction in *Lupinus* spp. by *Myzus persicae* (Homoptera: Aphididae) feeding. *Entomologia Experimentalis et Applicata* 117: 155-163.
39. Klingler J, Creasy R, Gao L, Nair RM, Calix AS, Spafford-Jacob H, **Edwards OR**, & Singh KB. 2005. Aphid resistance in *Medicago truncatula* involves antixenosis and phloem specific, inducible antibiosis, and maps to a single locus flanked by NBS-LRR resistance gene analogs. *Plant Physiology* 37 (4): 1445-1455.