CURRICULUM VITAE

Full Name: Maxwell John Scott

Position: Professor, North Carolina State University

Work address: Department of Entomology and Plant Pathology
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Academic Qualifications:

BSc (Hons)	1st class in Biochemistry	Western Australia	1980
PhD	Molecular Cell Biology	Baylor College of Medicine	1986
	Dissertation: "Higher order chromatin structure of the ovomucoid-ovoinhibitor gene complex"		

Professional Positions Held:

- Professor, Dept. of Entomology and Plant Pathology, NCSU, Raleigh, NC, USA (2016-present)
- Professor, Dept. of Entomology, NCSU, Raleigh, NC, USA (2013-2016)
- Assoc. Prof., Dept. of Genetics, NCSU, Raleigh, NC, USA (2010-2013)
- Assoc. Prof., Institute of Molecular BioSciences, Massey University, New Zealand (2007-2009).
- Senior Lecturer, Institute of Molecular BioSciences, Massey University, New Zealand (1998-2006).
- Lecturer, Department of Microbiology and Genetics, Massey University, New Zealand (1993-1997).
- Research Associate, Department of Biology, Emory University, Atlanta, Georgia, USA (1992-1993).
- Research Associate, Institute of Molecular Biology and Biotechnology, Heraklion, Crete, GREECE (1990-1992).
- N.I.H. postdoctoral fellow, Department of Biology, University of North Carolina, Chapel Hill, North Carolina, USA (1987-1990).

Other Professional Experience:
2015-present Academic editor, "*PLoS ONE*"

2015-present	Member, editorial board of the journal "*Hereditas*" .
2015-present	Member, FAO/IAEA Co-ordinated Research Project on the "Comparing RearingEfficiency and Competitiveness of Sterile Male Strains Produced by Genetic, Transgenic or Symbiont-Based Technologies"
2014-present	Member, editorial board of the journal "*Insects*".
2009-2014:	Member, FAO/IAEA Co-ordinated Research Project on the "Development and Evaluation of Improved Strains of Insect Pests for SIT"
2008:	Organizer, "3rd Molecular Invertebrate Workshop", 8-10 Feb, Napier, New Zealand
2008:	Organizer, *Queenstown Molecular Biology* meeting on "Epigenetics", 31 Aug-2 Sept, Queenstown, New Zealand
2008:	Member, NHMRC (Australia) biochemistry grant review panel
2004-2008:	Member, FAO/IAEA Co-ordinated Research Project "Molecular technologies to improve the effectiveness of SIT"
2000-2002:	Member, FAO/IAEA Co-ordinated Research Project on the "Enhancement of the sterile insect technique through genetic transformation using nuclear techniques"

Present Research Speciality: Gene regulation in insects

Honours and Awards

- Teaching Award from the Institute of Molecular BioSciences, Massey University (2002). In recognition of student evaluations of third year genetics courses.
- Applied Biosystems Award for research from the New Zealand Society for Biochemistry and Molecular Biology (2001). This is the society's highest award and is based on high impact papers published over a 3year period.
- Applied Biosystems Award (2000)-an annual award made to the outstanding researcher in the Institute of Molecular BioSciences, Massey University.
- National Institutes of Health (USA) postdoctoral fellowship (1988-1990)
- Hackett PhD Studentship (Univ. W.A.) (1981-1984)
- JA Wood prize for outstanding graduate in science, medicine, engineering and agriculture (UWA) (1980).
- Swan Brewery prize in Biochemistry (UWA) (1980).
- Wilsmore prize in Chemistry (UWA) (1979).
- Lady James prize in Natural Science (UWA) (1979).
- Shell prize in Chemistry (UWA) (1978).

Graduate Students Supervised at NCSU

PhD

Sophia Webster (2013-present)
Katherine Knudsen (2013-present)
Megan Williamson (2015-present)

Masters

Rebecca Edman (completed 2013) “Developing Molecular Tools for a Male-only Strain of the New World Screwworm (*Cochliomyia hominivorax*)”

Graduate Students Supervised at Massey University in New Zealand (1993-2009)

PhD

Xuelei Li (completed 2002) "Development of a genetically modified strain of the Australian sheep blowfly *Lucilia cuprina* suitable for a sterile release program".
Vikki Weake (completed 2005) "Isolation of *cis*-DNA insulator elements that prevent dosage compensation of X-linked gene in *Drosophila melanogaster*".
Corey Laverty (completed 2010) "The importance of the promoter in *Drosophila* dosage compensation".

Masters

Kathryn Frith (completed 1997) "Isolation and characterisation of the *Drosophila Dror2* gene".
Helen Fitzsimons (completed 1998) "Development of a reporter gene assay to identify control elements required for dosage compensation in *Drosophila melanogaster*".
Lewis Pan (completed 1998) "MSL1 plays a central role in assembly of the MSL complex, which mediates dosage compensation in *Drosophila melanogaster*".
Rebecca Henry (completed 2000) "A study of *cis*-acting elements required for dosage compensation in *Drosophila melanogaster*".
Simon Hills (completed 2003) " A cDNA subtraction approach to isolate male-specific genes from *Ceratitis capitata*".
Bradley McLellan (completed 2004) "An investigation into the potential binding of the MSL3 chromodomain to a modified histone".
Charles Ellen (completed 2008) "RNAi-mediated knockdown of chromatin modifier proteins and their effect on long-term memory in *Drosophila*"

Postdoctoral Fellows/Research Scholars Supervised

NCSU (2010-present)

Dr. Melina Florez-Cuadros (2017-present)
Dr. Kara Bolz (2017-present)
Dr. William Reid (2016-present)
Dr. Rebecca Linger (2013-present)
Dr. Fang Li (2010-2012 and 2014-2016)
Dr. Ying Yan (2013-2015)
Dr. Carolina Concha (2012-2014)

Massey University (1993-2009)

Dr. Helen Fitzsimons (2008-2009)
Dr. Fang Li (2002-2009)
Dr. Carolina Concha (2005-2008)
Dr. Abhimanyu Sarkar (2003-2006)
Dr. Anja Schiemann (2004-2007)
Dr. Jörg Heinrich (1997-2000)

Publications

Research Articles in Refereed Journals

1. Yan, Y., Linger, R.J. and **Scott, M.J.** (2017) Transgenic early-larval sexing systems for genetic control of the Australian sheep blow fly *Lucilia cuprina*. *Scientific Reports*, in press.

2. **Scott, M.J.**, Gould, F., Lorenzen, M.D., Grubbs, N., Edwards, O.R. and O'Brochta, D.A. (2017) Agricultural Production: Assessment of the Potential use of Cas9-mediated Gene Drive Systems for Agricultural Pest Control. *J. Responsible Innovation,* **in press**

3. Concha, C., Palavesam, A., Guerrero, F.D., Sagel, A., Li, F., Hernandez, Y., Pardo, T., Quintero, G., Vasquez, M., Phillips, P.L., McMillan, W.O., Skoda, S.R. and **Scott, M.J.** (2016) A transgenic male-only strain of the New World screwworm for an improved control program using the sterile insect technique. *BMC Biology*, **14:** 72. DOI: 10.1186/s12915-016-0296-8

4. Schwartz, S., Truglio, M., **Scott, M.J.**, and Fitzsimons, H.L. (2016) Long-term Memory in *Drosophila* Is Influenced by the Histone Deacetylase HDAC4 Interacting with the SUMO-Conjugating Enzyme Ubc9. *Genetics*. **203:** 1249-1264. doi: 10.1534/genetics.115.183194

5. Linger, R. J., Belikoff, E. J., Yan, Y., Li, F., Wantuch, H. A., Fitzsimons, H. L. and **Scott, M. J.** (2016) Towards next generation maggot debridement therapy: transgenic *Lucilia sericata* larvae that produce and secrete a human growth factor. *BMC Biotechnol*. **16**:30. doi: 10.1186/s12896-016-0263-z. PubMed PMID: 27006073.

6. Li, F. and **Scott, M. J.** (2016) CRISPR/Cas9-mediated mutagenesis of the *white* and *Sex lethal* loci in the invasive pest, *Drosophila suzukii*. *Biochem Biophys Res Commun.* **469** (4): 911-916. doi: 10.1016/j.bbrc.2015.12.081. PubMed PMID: 26721433.

7. Yan, Y. and **Scott, M. J.** (2015) A transgenic embryonic sexing system for the Australian sheep blow fly *Lucilia cuprina*. *Sci. Rep.***5**, 16090; doi: 10.1038/srep16090

8. Linger, R.J., Belikoff, E.J. and **Scott, M.J.** (2015) Dosage Compensation of X-Linked Muller Element F Genes but Not X-Linked Transgenes in the Australian Sheep Blowfly. PLoS ONE **10**(10): e0141544. doi:10.1371/journal.pone.0141544

9. Edman, R.M., Linger, R.J., Belikoff, E.J., Li, F., Sze, S.-H., Tarone, A.M. and **Scott, M.J.** (2015) Functional characterization of calliphorid cell death genes and cellularization gene promoters for controlling gene expression and cell viability in early embryos. *Insect Molecular Biology*, **24**: 58-70. doi: 10.1111/imb.12135

10. International *Glossina* Genome Initiative (includes **Scott, M.J.**) (2014) Genome sequence of the tsetse fly (*Glossina morsitans*): vector of African trypanosomiasis. *Science*, Apr 25;**344**(6182):380-6. doi: 10.1126/science.1249656.

11. Li, F., Wantuch, H.A., Linger, R.J., Belikoff, E.J. and **Scott, M.J.** (2014) Transgenic sexing system for genetic control of the Australian sheep blow fly *Lucilia cuprina*. *Insect Biochemistry and Molecular Biology*, **51**: 80-88. doi: 10.1016/j.ibmb.2014.06.001

12. Fitzsimons H.L., Schwartz S., Given F.M., **Scott M.J.** (2013) The Histone Deacetylase HDAC4 Regulates Long-Term Memory in *Drosophila*. *PLOS ONE* **8(12): e83903**. doi:10.1371/journal.pone.0083903

13. Li, F., Vensko II, S.P., Belikoff, E.J. and **Scott, M.J.** (2013) Conservation and sex-specific splicing of the *transformer* gene in the calliphorids *Cochliomyia hominivorax*, *Cochliomyia macellaria* and *Lucilia sericata. PLOS ONE,* **8(2):**e56303. doi: 10.1371/journal.pone.0056303

14. Sze, S-H., Dunham, J.P., Carey, B., Chang, P.L., Li, F., Edman, R.M., Fjeldsted, C., **Scott, M.J.**, Nuzhdin, S.V. and Tarone, A.M. (2012) A *de novo* transcriptome assembly of *Lucilia sericata* (Diptera: Calliphoridae) with predicted alternative splices, single nucleotide polymorphisms and transcription expression estimates. *Insect Molecular Biology*, **21:** 205-221. doi: 10.1111/j.1365-2583.2011.01127.x

15. Stasiuk, S.J., **Scott, M.J.** and Grant, W.N. (2012) Developmental plasticity and the evolution of parasitism in an unusual nematode, *Parastrongyloides trichosuri*. *EvoDevo,* **3**:1 doi:10.1186/2041-9139-3-1

16. Concha, C., Edman, R.M., Belikoff, E.J., Schiemann, A.H., Carey, B., and **Scott, M.J.** (2012) Organization and expression of the Australian sheep blowfly (*Lucilia cuprina*) *hsp23*, *hsp24, hsp70* and *hsp83* genes. *Insect Molecular Biology*, **21:** 161-180. doi: 10.1111/j.1365-2583.2011.01123.x

17. Fitzsimons, H.L. and **Scott, M.J.** (2011) Genetic modulation of *Rpd3* expression impairs long-term courtship memory in *Drosophila*. *PLOS ONE,* **6(12):** e29171. doi: 10.1371/journal.pone.0029171

18. Laverty, C., Li, F., Belikoff, E.J. and **Scott, M.J.** (2011) Abnormal dosage compensation of reporter genes driven by the *Drosophila* glass multiple reporter (GMR) enhancer-promoter. *PLOS ONE*, **6(5):** e20455. doi:10.1371/journal.pone.0020455

19. Concha, C., Belikoff, E.J., Carey, B., Li, F., Schiemann, A.H., and **Scott, M.J.** (2011) Efficient germ-line transformation of the economically important pest species *Lucilia cuprina* and *Lucilia sericata* (Diptera, Calliphoridae). *Insect Biochemistry and Molecular Biology*, **41:** 70-75. doi:10.1016/j.ibmb.2010.09.006.

20. **Scott, M.J.**, Atapattu, A., Schiemann, A.H., Concha, C., Henry, R., Carey, B., Belikoff, E.J., Heinrich, J.C. and Sarkar, A. (2011) Organisation and expression of a

cluster of *yolk protein* genes in the Australian sheep blowfly, *Lucilia cuprina*. *Genetica,* **139:** 63-70. doi: 10.1007/s10709-010-9492-6.

21. Concha C., Li F. and **Scott M. J.** (2010) Conservation and sex-specific splicing of the *doublesex* gene in the economically important pest species *Lucilia cuprina*. *J. Genet*. **89**: 279–285

22. Moore, S.A., Ferhatoglu, Y., Jia, Y., Al-Jiab, R.A. and **Scott, M.J.** (2010) Structural and biochemical studies on the chromo-barrel domain of male specific lethal 3 (MSL3) reveal a binding preference for mono or dimethyl lysine 20 on histone H4. *J. Biol. Chem*. **285**: 40879-90. doi:*10.1074/jbc.M110.134312*

23. Schiemann, A.H., Li, F., Weake, V.M., Belikoff, E.J., Klemmer, K.C., Moore, S.A. and **Scott, M.J.** (2010) Sex-biased transcription enhancement by a 5' tethered Gal4-MOF histone acetyltransferase fusion protein in *Drosophila*. *BMC Molecular Biology*, **11**:80. doi:10.1186/1471-2199-11-80

24. Schiemann, A.H., Weake, V.M., Li, F., Laverty, C., Belikoff, E.J., and **Scott, M.J.** (2010) The importance of location and orientation of male specific lethal complex binding sites of differing affinities on reporter gene dosage compensation in *Drosophila*. *Biochemical and Biophysical Research Communications*, **402:** 699-704. doi:10.1016/j.bbrc.2010.10.088.

25. Concha, C. and **Scott, M.J.** (2009) Sexual development in *Lucilia cuprina* (Diptera, Calliphoridae) is controlled by the *transformer* gene. *Genetics* **182**: 785–798. doi:10.1534/genetics.109.100982

26. Li, F., Schiemann, A.H. and **Scott, M.J.** (2008) Incorporation of the non-coding *roX* RNAs alters the chromatin binding specificity of the *Drosophila* MSL1/MSL2 complex. *Mol. Cell. Biol.* **28:** 1252-1264. doi:10.1128/MCB.00309-08

27. Weake, V.M. and **Scott, M.J.** (2007) The non-dosage compensated *Lsp1alpha* gene of *Drosophila melanogaster* escapes acetylation by MOF in larval fat body nuclei, but is flanked by two dosage compensated genes. *BMC Mol Biol*, **8:** 35. doi:10.1186/1471-2199-8-35

28. Sarkar, A., Atapattu, A., Belikoff, E.J., Heinrich, J.C., Li, X., Horn, C., Wimmer, E.A. and **Scott, M.J**. (2006) Insulated *piggyBac* vectors for insect transgenesis. *BMC Biotechnology*. **6:** 27. doi:10.1186/1472-6750-6-27

29. Li, F., Parry, D.A.D. and **Scott, M.J.** (2005) The amino-terminal region of *Drosophila* MSL1 contains basic, glycine-rich, and leucine zipper-like motifs that promote X chromosome binding, self-association, and MSL2 binding, respectively. *Mol. Cell. Biol.* **25:** 8913-8924. doi: 10.1128/MCB.25.20.8913-8924.2005

30. **Scott, M.J.**, Heinrich, J.C. and Li, X. (2004) Progress towards the development of a transgenic strain of the Australian sheep blowfly (*Lucilia cuprina*) suitable for a male-only sterile release program. *Insect Biochem Mol Biol*, **34**: 185-192.

31. Heinrich, J.C., Li, X., Henry, R.A., Haack, N., Stringfellow, L., Heath, A. and **Scott, M.J.** (2002) Germ-line transformation of the Australian sheep blowfly *Lucilia cuprina*. *Insect Mol. Biol.,* **11:** 1-10.

32. Li, X., Heinrich, J.C. and **Scott, M.J.** (2001) *piggyBac*-mediated transposition in *Drosophila melanogaster*: an evaluation of the use of constitutive promoters to control transposase gene expression *Insect Mol. Biol.,* **10:** 447-455.

33. Henry, R.A., Tews, B., Li, X. and **Scott , M.J.** (2001) Recruitment of the MSL dosage compensation complex to an autosomally integrated *roX* chromatin entry site correlates with an increased expression of an adjacent reporter gene in male Drosophila. *J. Biol. Chem.,* **276:** 31953-31958. doi:10.1074/jbc.M103008200

34. Heinrich, J.C. and **Scott, M.J.** (2000) A repressible female-specific lethal genetic system for making transgenic insect strains suitable for a sterile-release program. *Proc. Natl. Acad. Sci. USA,* **97**: 8229-8232. doi:10.1073/pnas.140142697

35. **Scott, M.J.**, Pan, L.L., Cleland, S.B., Knox, A.L. and Heinrich J.C. (2000) MSL1 plays a central role in assembly of the MSL complex, essential for dosage compensation in *Drosophila*. *EMBO J.*, **19**: 144-155. doi:10.1093/emboj/19.1.144

36. Fitzsimons, H., Henry, R. and **Scott, M.J.** (1999) Development of an insulated reporter system to search for *cis*-acting sequences required for dosage compensation in *Drosophila*. *Genetica*, **105**: 215-226.

37. Zhou, S., Yang, Y., **Scott, M.J.**, Pannuti, A., Fehr, K.C., Eisen, A., Koonin, E.V., Fouts, D.L., Wrightsman, R., Manning, J.E. and Lucchesi, J.C. (1995) Male-specific lethal 2, a dosage compensation gene of *Drosophila*, undergoes sex-specific regulation and encodes a protein with a RING finger and a metallothionein-like cysteine cluster. *EMBO J*. **14**: 2884-2895.

38. Banks, G.K., Robinson, A.S., Kwiatowski, J., Ayala, F.J., **Scott, M.J.** and Kriticou, D. (1995) A second superoxide dismutase gene in the Medfly, *Ceratitis capitata. Genetics* **140:** 697-702.

39. **Scott, M.J.**, Kritikou, D. and Robinson, A.S. (1993) Isolation of cDNAs encoding 6-phosphogluconate dehydrogenase and glucose 6-phosphate dehydrogenase from the mediterranean fruit fly, *Ceratitis capitata*: correlating genetic and physical maps of chromosome 5. *Insect Mol. Biol.,* **1**: 213-222.

40. **Scott, M.J.** and Lucchesi, J.C. (1991) Structure and expression of the *Drosophila melanogaster* gene encoding 6-phosphogluconate dehydrogenase. *Gene* **109:** 177-183.

41. **Scott, M.J.**, Tsai, M.-J. and O'Malley, B.W. (1987) Deoxyribonuclease I sensitivity of the ovomucoid-ovoinhibitor gene complex in oviduct nuclei and relative location of CR1 repetitive sequences. *Biochemistry* **26:** 6831-6840.

42. **Scott, M.J.**, Huckaby, C.S., Kato, I., Kohr, W.J., Laskowski, M., Jr., Tsai, M.-J. and O'Malley, B.W. (1987) Ovoinhibitor introns specify functional domains as in the related and linked ovomucoid gene. *J. Biol. Chem.* **262**: 5899-5907.

43. Simmen, R., Tanaka, T., Ts'ui, K.F., Putkey, J., **Scott, M.J.**, Lai, E.C. and Means, A.R. (1985) The structural organization of the chicken calmodulin gene. *J. Biol. Chem*. **260**: 907-912.

Reviews

1. **Scott, M.J.**, Concha, C., Welch, J.B., Phillips, P.L. and Skoda, S.R (2017) Research advances in the screwworm eradication program over the past 25 years. *Entomologia Experimentalis et Applicata*, in press

2. Anstead, C. A., Batterham, P., Korhonen, P. K., Young, N. D., Hall, R. S., Bowles, V. M., Richards, S., **Scott, M. J.** and Gasser, R. B. (2016) A blow to the fly - *Lucilia cuprina* draft genome and transcriptome to support advances in biology and biotechnology. *Biotechnol Adv.* **34**: 605-620. doi: 10.1016/j.biotechadv.2016.02.009. PubMed PMID: 26944522.

3. **Scott, M. J.** (2014) Development and evaluation of male-only strains of the Australian sheep blowfly, *Lucilia cuprina*. *BMC Genetics*, **15**(Suppl 2):S3. doi:10.1186/1471-2156-15-S2-S3

4. Sandeman, R. M., Levot, G., Heath, A. G., James, P. J., Greeff, J. C., **Scott, M. J.**, Batterham, P. and Bowles, V. M. (2014) Control of the Sheep Blowfly - are we there yet? *Int. J. Parasitol.*, **44**:879-891 pii: S0020-7519(14)00231-8. doi: 10.1016/j.ijpara.2014.08.009

5. **Scott, M.J.**, Pimsler, M.L. and Tarone, A.M. (2014) Sex determination mechanisms in Calliphoridae (blow flies), *Sexual Development*, 8(1-3): 29-37. doi: 10.1159/000357132.

6. **Scott, M.J.** and Li, F. (2008) How do ncRNAs guide chromatin-modifying complexes to specific locations within the nucleus? *RNA Biology* **5**: 13-16.

7. **Scott, M.J.** (2001) Making 1X=2X: Studies on dosage compensation in Drosophila. *NZ BioScience* **9 (4)**: 23-24.

8. **Scott M.J.** (2001) Progress towards the development of a transgenic strain of the Australian sheep blowfly suitable for a sterile-release program. *NZ BioScience* **9 (2):** 11-13.

9. Frith, K.J. and **Scott M.J.** (1999) Isolation and characterisation of the *Drosophila Dror2* gene. *NZ BioScience* **7:** 17-22.

Book Chapters

1. **Scott, M.J.** and Benedict, M.Q. (2015). Concept and history of genetic control. In: "Genetic Control of Malaria and Dengue", (Adelman, Z. N. ed.) Elsevier, Amsterdam, pp 31-54.

2. **Scott, M.J.**, Morrison, N.I., Simmons, G.S. (2014) Transgenic approaches for sterile insect control of dipteran livestock pests and lepidopteran crop pests. In: "Transgenic Insects: Techniques and Applications" (Benedict, M.Q., ed.) pp 152-167, CABI, Wallingford, UK.

3. Stein, J.P., **Scott, M.J.**, and O'Malley, B.W. (1990) Intervening sequences in molecular evolution. In: "Intervening Sequences in Evolution and Development" (Stone, E.M. and Schwartz, R.M., eds.) pp 92-111. Oxford University Press, New York.

4. Huckaby, C.S., Ciejek, E.M., **Scott, M.J.**, Alevy, M.C., Tsai, M.-J. and O'Malley, B.W. (1985) Nuclear matrix: Relationship to DNase I sensitivity and transcriptional activity. In: UCLA Symposia "Nuclear Envelope Structure and RNA Maturation" (Smuckler, E.A., and Clawson, G.A., eds.) Vol. 26, pp 87-97. Alan R. Liss, Inc., New York.

5. Tsai, M.-J., Tsai, S.Y., Baez, M., Simmen, F.A., **Scott, M.J.**, and O'Malley, B.W. (1985) Expression of eukaryotic genes: Transcription and analysis. In: "Laboratory Methods Manual for Hormone Action and Molecular Endocrinology" (Schrader, W.T. and O'Malley, B.W., eds.), pp 13.1-13.4. Houston Biological Assoc. Inc.

Patents

1. Scott, M.J., Linger, R.J. and Belikoff, E.J. (2017) Genetically engineered larvae for wound healing. US provisional patent application No. 62/473,704

Grants Received

External (PI unless otherwise indicated)

- $293,593 from the Defence Advanced Research Projects Agency (DARPA) for the project "Genetically engineered medicinal larvae for wound healing" (2017-2018).
- $499,851 from the AFRI Biotechnology Risk Assessment Program for the project "Development and evaluation of safeguards for conditional suppressive gene drives for spotted wing Drosophila and the New World screwworm" (2016-2019).
- One of several co-PIs on the NIFA SCRI project "Sustainable strategies to manage spotted wing *Drosophila* in United States fruit crops" (2015-2019). Total funding is $6,745,400.
- $633,379 from the Panama-United States Commission for the Eradication and Prevention of Screwworm (COPEG) for the project "Transgenic embryonic sexing strains of the New World screwworm: A 4-year plan for continued development and evaluation" (2015-2018).
- $99,870 from the North Carolina Biotechnology Center for the project "Development of an engineered strain of spotted wing *Drosophila* (*D. suzukii*) ideal for a genetic control program" (2013-2014)

- $201,026 from the USDA-ARS for the project "Development of a male-only strain of the New World screwworm fly *Cochliomyia hominivorax* (Diptera, Calliphoridae) (2012-2017). Agreement number 59-6205-3-001
- $499,819 from NIFA for the Biotechnology Risk Assessment grant "An investigation into the potential risks of release of transgenic New World screwworm fly *Cochliomyia hominivorax*" (2011-2015).
- $177,196 from the North Carolina Biotechnology Center for the project "Establishment of an Insect Transformation Facility" (2011)
- $69,000 from the USDA-ARS for the project "Development of a male-only strain of the New World screwworm fly *Cochliomyia hominivorax* (Diptera, Calliphoridae) (2010-2014).
- $100,000 from the North Carolina Biotechnology Center for the project "Improving Transgenesis Methods for Economically Important Lepidoptera" (2010-2012) (co-investigator)
- $NZ 30,000 from HortResearch for the "Tortricid Transformation Project" (2008-2009).
- $NZ 10,000 from the Palmerston North Medical Research Foundation for the project "The molecular basis of maggot therapy" from 1 January 2008 to 31 December 2008.
- $NZ 318,021 from Australian Wool Innovation Inc for the project "Sheep blowfly genome project" from November 2004 to October 2007.
- $NZ 588,652 from Meat and Wool Innovation (formerly Wool*Pro*) for the project "Molecular genetic control of the Australian sheep blowfly" from July 1997 to September 2003.
- $NZ 568,888 from the Marsden fund for the project "Regulation of X-linked genes in flies" from February 2003 to January 2006.
- $24,000 from the International Atomic Energy Agency for "Identification of the sex determining genes from the medfly and tsetse fly" from August 1999 to July 2002.
- $NZ 21,565 from the C. Alma Baker Trust for "Molecular Genetic Control of the Sheep Blowfly", 2002.
- $NZ 15,120 from the C. Alma Baker Trust for "Molecular Genetic Control of the Sheep Blowfly", 2000.
- $NZ 28,000 from the New Zealand Lottery Grants Board for "Molecular genetic analysis of two genes required for brain development" from November 1997 to October 1999.
- $NZ 10,000 from the New Zealand Lottery Grants Board for "Molecular genetic control of insect pests in New Zealand" from September 1996 to August 1997.
- $NZ 30,000 from the New Zealand Lottery Grants Board for "Molecular genetic control of insect pests in New Zealand" from September 1994 to August 1996.

Massey University Research Fund (MURF)

$NZ 127,078 for a postdoctoral fellow for 2 years to work on the project "Are memories written in the histone code?" (2008-2009)

$NZ 70,000 for salary for a technician for 2 years for the project "Molecular basis of maggot therapy" (2006-2008).

$NZ 120,000 for salary for a postdoctoral fellow and running costs for the project "Regulation of X-linked genes" (2002-2004).
$NZ 3,000 for "Importation of GM flies" (2001), final payment to ERMA for a permit to import genetically modified vinegar flies, *Drosophila melanogaster*.
$NZ 5,000 for "Importation of GM flies" (2000), towards part of the cost of application to ERMA for a permit to import genetically modified vinegar flies, *Drosophila melanogaster*.
$NZ 9,779 for purchase of a waterbath with controller (MUREF) for the project "Genetic control of insect pests" (1997).
$NZ 3,017 for "Molecular genetic analysis of two genes" (1997)
$NZ 11,694 for student summer research assistant plus some running costs for the project "Molecular genetic control of insect pests in NZ" (1996)
$NZ 1,610 for "Isolation of the Drosophila homolog of human *dtk*" (1996)
$NZ 2,200 for "Identification of regions of the MSL-1 protein" (1994)
$NZ 2,500 for "Isolation of the Drosophila homolog of human *dtk*" (1994)

Talks

International Conferences

- Second Research Coordination Meeting (RCM) on the FAO/IAEA Co-ordinated Research Project "Comparing Rearing Efficiency and Competitiveness of Sterile Male Strains Produced by Genetic, Transgenic or Symbiont-based Technologies" in Panama City, Panama from 27-31 March, 2017. Presentation: "Transgenic sexing strains: evaluation of the influence of genetic background in *Drosophila* and new *Lucilia cuprina* gene promoters for driving tTA expression".
- ICE 2016, XXV International Congress of Entomology, Orlando, FL, USA, September 25-30 on *Development and evaluation of male-only strains of the New World screwworm*
- First Research Coordination Meeting (RCM) on the FAO/IAEA Co-ordinated Research Project "Comparing Rearing Efficiency and Competitiveness of Sterile Male Strains Produced by Genetic, Transgenic or Symbiont-based Technologies" in Vienna, Austria from 6 to 10 July, 2015. Presentation: "Transgenic sexing systems for genetic control of the New World screwworm and the Australian sheep blowfly".
- COPEG Stakeholders Meeting, Panama City, Republic of Panama May 6, 2015. Presentation: " Prospectus of Genetically Modified Male only Screwworm Strain", with Steve Skoda, USDA-ARS.
- XIV COPEG commissioners meeting, Washington DC, October 9, 2014. Presentation "Status of Developing the Genetically Modified Screwworm Strain(s)".
- "10th European Congress of Entomology" in York, England, August 3-8, 2014. Presentation: "Transgenic sexing systems for genetic control of the New World screwworm *Cochliomyia hominivorax*".
- Fourth Research Coordination Meeting (RCM) on the FAO/IAEA Co-ordinated Research Project "Development and Evaluation of Improved Strains of Insect Pests for SIT" in Capri, Italy from April 7-11, 2014. Presentation: " Transgenic sexing systems for genetic control of the New World Screwworm and the Australian sheep blow fly ".

- "Sex determination in insects" in Paris, France, 12-14 June 2013. Presentation: "Sex determination mechanisms in calliphorids (blow flies)"
- "XXIV International Congress of Entomology" in Daegu, South Korea, August 19-25, 2012. Presentation: "Development of "male-only" strains of the New World screwworm fly, *Cochliomyia hominivorax*".
- Second Research Coordination Meeting (RCM) on the FAO/IAEA Co-ordinated Research Project "Development and Evaluation of Improved Strains of Insect Pests for SIT" in Nanjing, China from May 9-13, 2011. Presentation: "Development of tetracycline-repressible female lethal strains of the New World screwworm fly, *Cochliomyia hominivorax* ".
- First Research Coordination Meeting (RCM) on the FAO/IAEA Co-ordinated Research Project "Development and Evaluation of Improved Strains of Insect Pests for SIT" in Vienna, Austria from 16 to 20 November 2009. Presentation: "Development of Sexing Systems in Flies and Moths".
- Epigenetics 2007, Perth, Australia (4-7 November). Presentation; "Incorporation of the noncoding roX RNAs alters the chromatin binding specificity of the *Drosophila* MSL1/MSL2 complex".
- Third Research Coordination Meeting (RCM) on the FAO/IAEA Co-ordinated Research Project "Molecular technologies to improve the effectiveness of SIT" in Bangkok, Thailand, 2 to 6 November 2006. Presentation: "Improved Germ-line Transformation of the Australian Sheep Blowfly, *Lucilia cuprina".*
- "Symposium on genetic control for Australian sheep blowfly-new perspectives", Canberra, Australia (6 December 2005). Presentation: "Genetic modification of the Australian sheep blowfly, *Lucilia cuprina*".
- Epigenetic regulation in disease and development", Canberra, Australia (29 November to 2 December 2005). Presentation: "The role of MSL1 in the selective recognition of the male X chromosome by the MSL complex".
- "Second Great Barrier Reef Drosophila Conference", Cairns, Australia (8-12 September 2005). Presentation: "The role of MSL1 in the selective recognition of the male X chromosome by the MSL complex".
- Second Research Coordination Meeting (RCM) on the FAO/IAEA Co-ordinated Research Project "Molecular technologies to improve the effectiveness of SIT" in Vienna, Austria from 14-17 May 2005. Presentation: "Development of a transgenic strain of the Australian sheep blowfly (*Lucilia cuprina*) suitable for a male-only sterile release program"
- First Research Coordination Meeting (RCM) on the FAO/IAEA Co-ordinated Research Project "Molecular technologies to improve the effectiveness of SIT" in Vienna, Austria from 19 to 23 January 2004. Presentation: "Development of a transgenic strain of the Australian sheep blowfly (*Lucilia cuprina*) suitable for a male-only sterile release program"
- "Fourth International Workshop on Transgenesis and Genomics of Invertebrate Organisms", Asilomar conference center, Pacific Grove, California, U.S.A. (May 11-15, 2003). Presentation: " Progress Towards the Development of a Transgenic Strain of the Australian Sheep Blowfly Suitable for a Male-Only Release Program".
- Final FAO/IAEA research coordination meeting on the "Enhancement of the sterile insect technique through genetic transformation using nuclear techniques", Capri, Italy (8-12 July, 2002). Presentation: "Progress towards

the development of a transgenic strain of the Australian sheep blowfly (*Lucilia cuprina*) suitable for a sterile release program".

- Corowa Insect Molecular Biology Meeting, Corowa,, Australia (8 Sept 2001) "Gene Regulation in Flies: Studies on Dosage Compensation in Drosophila and Development of a Transgenic Strain of the Sheep Blowfly Suitable for a Male-Only Release Program".
- Keystone symposia on the "Genetic Manipulation of Insects", Taos, New Mexico, U.S.A. (Feb. 2001). Two presentations: "Regulation of Genetically Modified Insects in New Zealand" and "Development of a Transgenic Strain of the Australian Sheep Blowfly Suitable for a Male-Only Release Program".
- FAO/IAEA research coordination meeting on the "Enhancement of the sterile insect technique through genetic transformation using nuclear techniques", Sao Paolo, Brazil (Aug. 14-18, 2000): "Development of a transgenic strain of the Australian sheep blowfly suitable for a sterile release program".
- 14th FAOBMB symposium, Dunedin, New Zealand (Nov. 30, 1999) "Assembly and X-chromosome specific binding of the MSL transcription enhancement complex in Drosophila".
- Genetics society of Australia, Perth, Australia (Sept. 28, 1997) "Expression of dominant-negative versions of MSL1 causes male specific lethality in Drosophila due to inhibition of dosage compensation".

National Conferences

- Project Director's meeting for the Biotechnology Risk Assessment Grants (BRAG) Program (May 23, 2017), Riverdale, MD. Poster presentation: "Development and evaluation of safeguards for conditional suppressive gene drives for spotted wing Drosophila and the New World screwworm ".
- "The sixth annual meeting of the American college of wound healing and tissue repair", Chicago, IL, December 1-3, 2016 on *Next Gen Maggot Therapy 2.0*
- 2016 Annual Meeting of WERA 1021, Orlando, FL, September 29, 2016 on *Male-only strains, Cas9 strains and gene drive in SWD*
- "Roadmaps to Gene Drives", Raleigh, NC, February 24-26, 2016 on *Assessment of the Potential use of Cas9-mediated Gene Drive Systems for Agricultural Pest Control"*
- Insect Pest Genomics meeting, College Station, TX., August 31, 2015. Invited talk on "New World screwworm genome project".
- American Association of Veterinary Parasitologists (AAVP) annual meeting, Boston, MA, July 11-14, 2015. Invited plenary presentation " Genetic control of ectoparasite dipteran livestock pests".
- Project Director's meeting for the Biotechnology Risk Assessment Grants (BRAG) Program (June 5, 2014), Riverdale, MD. Poster presentation: "Development and evaluation of male-only transgenic strains of the New World screwworm".
- WERA 1021: Spotted wing drosophila biology, ecology, and management, Austin, TX., November 14, 2013. "Towards Genetic Pest Management of *Drosophila suzukii*"
- Annual meeting of the Entomological Society of America, Austin, TX, November 10-13, 2013. "Developing male-only strains of the screwworm and the Australian sheep blowfly".

- Annual meeting of the Entomological Society of America, Knoxville, TN, November 11-14, 2012. Two presentations: "Characterization of blowfly gene promoters in transgenic *Lucilia cuprina*" and "Development of "male-only" strains of the New World screwworm fly, *Cochliomyia hominivorax*"
- Project Director's meeting for the Biotechnology Risk Assessment Grants (BRAG) Program (June 5-6, 2012), Riverdale, MD. "Development and evaluation of male-only transgenic strains of the New World screwworm fly"
- "Developmental Biology" a Queenstown Molecular Biology Meeting, Queenstown, NZ (4 September, 2009). Presentation: "The master-switch gene *transformer* controls female development in the Australian sheep blowfly "
- "Epigenetics" a Queenstown Molecular Biology Meeting, Queenstown, NZ (1 September, 2008). Presentation: "How do ncRNAs guide chromatin-modifying complexes to specific locations within the nucleus?"
- "Gene Expression and Chromatin Symposium", Auckland, NZ (30 September, 2006). Presentation: "Adaptation of a chromatin-modifying complex for X chromosome dosage compensation".
- "16th Annual Queenstown Molecular Biology Meeting", Queenstown, NZ (29 August- 1 September, 2006). Presentation: "Adaptation of a chromatin modifying complex for X chromosome regulation".
- "13th Annual Queenstown Molecular Biology Meeting", Queenstown, NZ (24-27 August, 2003). Presentation: "The role of MSL1 in assembly of the MSL complex and in specific binding to the X chromosome in male *Drosophila*".
- "Molecules for Life", Combined annual meeting of the New Zealand Biochemistry and Chemistry Societies, Napier, New Zealand (5 Dec 2001). Applied Biosystems medal presentation "Sex and Death in Flies: Adventures in Gene Regulation".
- Combined meeting of the Australian and New Zealand societies for Biochemistry and Molecular Biology, Wellington, New Zealand (Dec. 12, 2000) "Development of a transgenic strain of the Australian Sheep Blowfly Suitable for a Sterile Release Program".
- Joint Meeting of the New Zealand and Australian societies for Parasitology, Wellington, New Zealand (Sept 26, 2000) "Development of a transgenic strain of the Australian Sheep Blowfly Suitable for a Sterile Release Program".
- 8th Queenstown Molecular Biology Meeting, Queenstown, New Zealand (Aug. 18, 1998) "MSL1 associates with MSL2 and MOF, an X-chromosome-specific histone acetyl transferase in Drosophila".
- 4th Queenstown Molecular Biology Meeting, Queenstown, New Zealand (Aug. 18, 1994) "MSL1 and gene dosage compensation in Drosophila".

Other Invited Talks

- Department of Entomology, The University of Georgia, Athens, GA., February 27, 2017. Talk on "Genetically modified insect strains for genetic control of pests"
- LucchesiFest 2015: A celebration of the science and career of John C. Lucchesi. Emory University, Atlanta, GA., April 24, 2015. Presentation "Development of male-only strains of insect pests for genetic control programs"

- Center for Functional Genomics, Faculty of Medicine and Surgery, University of Perugia, Perugia, Italy (15 April 2014). “Developing male-only strains of the screwworm and the Australian sheep blowfly”.
- Oxitec, Oxford, U.K. (6 June 2013) “Development of "male-only" strains of the New World screwworm fly, *Cochliomyia hominivorax*”.
- Department of Plant Pathology, NCSU. (5 November 2012). Presentation: “Development of "male-only" strains of insect pests”.
- Department of Genetics, NCSU. (1 October 2012). Presentation: “Gene regulation in flies: dosage compensation, sex determination and development of male-only strains of pest species”.
- Department of Entomology, Texas A&M University, College Station, Texas (29 September, 2011). Presentation: "Developing transgenic strains for insect pest management programs"
- Department of Biochemistry, University of Saskatchewan, Saskatoon, Canada (21 July 2011). Presentation: "The Drosophila Male Specific Lethal RNA-protein complex: chromosome binding, evolution and transcription regulation".
- Institute of Plant Protection, Chinese Academy of Agricultural Sciences, Beijing, China. Two talks were given. " Development of transgenic strains of insect pests for genetic control programs" on 16 May 2011 and "Past, current and future approaches for the genetic control of insect pests" on 17 May 2011
- Department of Entomology, North Carolina State University, Raleigh, NC (18 April, 2011). "Developing transgenic strains for insect pest management programs"
- Department of Biochemistry, University of Otago, Dunedin, New Zealand (8 September 2009). "Sex determination and dosage compensation in flies: mechanisms, evolution and pest management"
- Department of Cellular and Molecular Biology, Baylor College of Medicine, Houston, TX, USA (26 March 2007). "Adaptation of the MSL chromatin-modifying complex for X chromosome dosage compensation".
- European Molecular Biology Laboratory (EMBL), Heidelberg, Germany (6 June 2006). "Down under studies on Drosophila dosage compensation.
- Lund University, Lund, Sweden (2 June 2006). "Down under studies on Drosophila X chromosome dosage compensation and sheep blowfly genetic modification"
- Adolf-Butenandt-Institut-Molekularbiologie, Munich, Germany (31 May 2006). "Down under studies on Drosophila dosage compensation.
- University of Pavia, Pavia, Italy (29 May 2006). " Insect transgenesis: a means for making strains for genetic control and for dissecting how a chromatin-modifying complex is targeted to the X chromosome ".
- AgResearch, Wallaceville (15 June 2005) "A transgenic approach to study gene regulation and function in Drosophila and sheep blowfly".
- Department of Biochemistry, Otago University, New Zealand (17 June 2003) "Gene regulation in flies: X chromosome dosage compensation in *Drosophila* and engineering a blowfly strain ideal for a male-only sterile release control program".
- The Western Australian Institute for Medical Research, Perth, Australia (29 August 2002) "Sex and Death in Flies: Adventures in Gene Regulation".

- Department of Molecular Medicine, The University of Auckland, New Zealand (19 April 2002) "Sex and Death in Flies: Adventures in Gene Regulation".
- Department of Genetics, The University of Melbourne, Melbourne, Australia (5 September 2001): "Gene Regulation in Flies: Studies on Dosage Compensation in Drosophila and Development of a Transgenic Strain of the Sheep Blowfly Suitable for a Male-Only Release Program".
- Centre for the Molecular Genetics of Development, The University of Adelaide, Adelaide, Australia (3 September, 2001): "Gene Regulation in Flies: Studies on Dosage Compensation in Drosophila and Development of a Transgenic Strain of the Sheep Blowfly Suitable for a Male-Only Release Program".
- Department of Molecular and Cellular Biology, Baylor College of Medicine, Houston, Texas, U.S.A. (20 March, 2000): "Sex-specific gene regulation in flies: Studies on the MSL complex and potential application for control of insect pests".
- Department of Biochemistry, University of Western Australia, Perth, Australia (Feb 7 2000): "Sex-specific gene regulation in flies: Studies on the MSL complex and potential application for control of insect pests".

Teaching

Undergraduate Courses at NCSU

Insect Genome manipulation (2017). Lectures and practical classes on genome manipulation approaches including transposon-based transgenesis, recombinases, RNAi and CRISPR/Cas9.

Graduate Courses at NCSU

Genetic Pest Management (fall 2010, 2012, 2013, 2014, 2016). Co-taught with Fred Gould and Marce Lorenzen. Covered past, current and possible future approaches for the genetic control of insect pests.

Epigenetics (spring 2012, 2014). This course covered selected topics on epigenetics including histone modification, histone variants, DNA methylation, X chromosome dosage compensation, cancer epigenomics.

Courses taught previously at Massey University, New Zealand (1993-2009)

Undergraduate genetics programme

- **Gene Regulation** (yr. 3). Major contribution to this advanced course. Lectures on promoter characterisation, DNA-protein interactions, role of chromatin in eukaryotes, X chromosome regulation, sex determination, development. Course controller.
- **Advanced Cell Biology (**yr. 3**).** Major contribution to this course. Topics covered include signal transduction, experimental approaches to study cell biology, apoptosis and cancer. Practical classes on yeast mating and protein-protein interactions.

- **Advanced Practical Genetics** (yr. 3). Supervise practicals on reporter genes and RNA isolation. Guide preparation of oral presentations and grant proposal. Course controller.
- **Molecular and Cellular Biology** (yr 3, Albany campus). Teach approx a quarter of this paper. Topics include cell cytoskeleton, signal transduction and apoptosis.
- **Developmental Genetics** (yr 3) Taught from 1994 to 2001. Paper now discontinued. Included topics on genetic screens for developmentally important genes using *Drosophila* as an example.
- **Genetic Analysis** (yr2). Taught from 1994 to 2003. Lectures on application of classical genetic analysis to study biochemical pathways, sex determination, gene regulation and developmental genetics.

Graduate programme in genetics

- **Genetic Analysis**. Lecture/discussion on genetic basis of learning/memory in flies.
- **Gene Expression.** Lecture/discussion on multi-protein complexes that regulate transcription via modification of chromatin structure.
- **Bioinformatics.** Lecture/discussion on functional genomics in eukaryotes.