

# Dr C. Simon Bawden

## Research Scientist, Molecular Biology

SOUTH  
AUSTRALIAN  
RESEARCH &  
DEVELOPMENT  
INSTITUTE  
**PIRSA**

### Qualifications

BSc (Hons) University of Adelaide  
PhD University of Adelaide  
Grad.Dip. Ed. SACAE

### Role

Dr Simon Bawden is Leader of the Livestock Innovation and Welfare Science Program within SARDI Livestock and Farming Systems. He is responsible for oversight of new research programmes with a focus on innovative solutions to livestock production efficiency and improvement of the welfare of production animals. The Science Program utilises multidisciplinary approaches which rely upon high level in-house expertise in contemporary livestock production systems, assisted reproduction, genetics, genomics and molecular biology and has strong national and international collaborations and funding.

### Research focus

In a Molecular Biology career spanning some 30 years, Simon's research has included gene discovery and analysis of gene expression in sheep towards trait improvement. With a focus on development of the wool follicle population, fibre formation and modification of wool properties, he has led projects in the Sheep CRC for Premium Quality Wool and Sheep Genomics Program. He is internationally recognised for his work in sheep transgenesis and has strong linkages with eminent scientists undertaking large animal transgenesis in the UK, Europe, the US and NZ.

In addition to the provision of a genetic testing service to the sheep industry, recent application of the transgenesis technology has involved the creation of a large animal biomedical model in sheep and the use of sheep in this sphere has become the major focus of his research.

### Major projects

In a collaboration with SARDI Reproduction Laboratory scientists and project technical and farm staff, Simon leads the research program "An Ovine Model of Huntington's Disease" supported predominantly by external funds from the Freemasons of NZ and the US-based Cure Huntington's Disease Initiative (CHDI) Foundation Inc..

The research program has produced a pre-symptomatic model of HD in sheep. As they age, sheep are continually monitored so that all key events in disease progression can be elucidated. Alterations to molecular and cellular pathology, whole-body physiology and behaviour of the HD model sheep are determined in collaboration with internationally renowned HD scientists based at Harvard Medical School (Boston, US), Centre for Brain Research (Auckland University, NZ) and Cambridge University (U.K.). Discovery of facets of early disease progression not measurable in HD patients is identifying new targets for localised and systemic therapies. Trials of one therapeutic agent designed to slow disease processes in the brain have been conducted and success of this work has led the team to embark upon creation of additional biomedical models.

### Key publications

Jacobsen JC, Bawden CS, Rudiger SR, McLaughlan CJ, Reid SJ, Waldvogel HJ, MacDonald ME, Gusella JF, Walker SK, Kelly JM, Webb GC, Faull RL, Rees MI, Snell RG. (2010). An ovine transgenic Huntington's disease model. *Human Molecular Genetics* 19(10):1873-1882.

Reid SJ, Patassini S, Handley RR, Rudiger SR, McLaughlan CJ, Osmand A, Jacobsen JC, Morton AJ, Weiss A, Waldvogel HJ, MacDonald ME, Gusella JF, Bawden CS, Faull RLM, and Snell RG (2013). Further Molecular Characterisation of the OVT73 Transgenic Sheep Model of Huntington's Disease Identifies Cortical Aggregates. *Journal of Huntington's Disease* 2:279-295.

Morton AJ, Rudiger SR, Wood NI, Sawiak SJ, Brown GC, McLaughlan CJ, Kuchel TR, Snell RG, Faull RL, Bawden CS (2014). Early and progressive circadian abnormalities in Huntington's disease sheep are unmasked by social environment. *Human Molecular Genetics* 23:3375-3383.

Handley, RR, Reid SJ, Patassini S, Rudiger SR, Obolonkin V, McLaughlan CJ, Jacobsen JC, Gusella JF, MacDonald ME, Waldvogel HJ, Bawden CS, Faull RLM and Snell RG (2016). Metabolic disruption identified in the Huntington's disease transgenic sheep model. *Nature Scientific Reports* 6, 20681; doi: 10.1038/srep20681

### Boards/Committees

Research Resource Committee, University of Adelaide  
SARDI WHS Committee



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