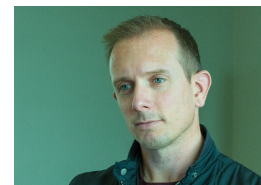


Andrew Barron  
Research Fellow  
Department of Biological Sciences  
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## Biography

Dr Barron is an Australian Research Council Future Fellow, and Deputy Head of the Department of Biological Sciences at Macquarie University. He is a neuroethologist, which is a discipline of neuroscience studying the neural mechanisms of natural animal behaviour. Most of his research focuses on insects, especially honey bees. Using advanced techniques to visualise, manipulate, map and record from the insect brain Barron's team has made important contributions to the understanding of fundamental behavioural systems such as cognition, navigation, social behaviour and learning and memory.

He also conducts research to improve honey bee health and welfare. He is studying how bees and bee colonies are impacted by pesticide and disease stressors, and how to best intervene to help bee colonies under stress.

## Employment

### ARC Future Fellow

Research Fellow  
Department of Biological Sciences  
Macquarie University  
1 Jun 2015 → present

### Macquarie University Species Spectrum Research Center

Macquarie University  
1 Jan 2017 → 31 Dec 2019

### Biomolecular Discovery and Design Research Centre

Macquarie University  
1 Jan 2017 → 31 Dec 2019

### Australian Research Council Future Fellow

Australian Research Council  
Canberra, Australia  
1 Jan 2015 → present

### President, Australasian Society for the Study of Animal Behaviour

AUSTRALASIAN SOCIETY OF THE STUDY OF ANIMAL BEHAVIOUR  
Australia  
1 Jan 2012 → 1 Jan 2014

### Vice-President, Australasian Society for the Study of Animal Behaviour

AUSTRALASIAN SOCIETY OF THE STUDY OF ANIMAL BEHAVIOUR  
Australia  
1 Jan 2010 → 1 Jan 2012

### Treasurer, Australasian Society for the Study of Animal Behaviour

AUSTRALASIAN SOCIETY OF THE STUDY OF ANIMAL BEHAVIOUR  
Australia  
1 Jan 2008 → 1 Jan 2010

### Postdoctoral Fellow, Research School of Biological Sciences

Australian National University

ACT 0200, Australia  
1 Jan 2004 → 1 Jan 2007

#### **Fullbright Postdoctoral Fellow**

University of Illinois  
Champaign, United States  
1 Jan 2001 → 1 Jan 2004

#### **Royal Society Postdoctoral Fellow**

University of Sydney  
2006, Australia  
1 Jan 1999 → 1 Jan 2001

## **Research output**

### **Biogenic amine modulation of honey bee sociability and nestmate affiliation**

Hewlett, S. E., Delahunt Smoleniec, J. D., Wareham, D. M., Pyne, T. M. & Barron, A. B., 25 Oct 2018, In : PLoS ONE. 13, 10, p. 1-18 18 p., e0205686.

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### **Cocaine directly impairs memory extinction and alters brain DNA methylation dynamics in honey bees**

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### **Cooperative defence operates by social modulation of biogenic amine levels in the honey bee brain**

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**A comparison of honeybee (*Apis mellifera*) queen, worker and drone larvae by RNA-Seq**

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**The evolution of honey bee dance communication: A mechanistic perspective**

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**Pheromonal control: Reconciling physiological mechanism with signalling theory**

Peso, M., Elgar, M. A. & Barron, A. B., 1 May 2015, In : *Biological Reviews*. 90, 2, p. 542-559 18 p.

**Death of the bee hive: Understanding the failure of an insect society**

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Perry, C. J., Søvik, E., Myerscough, M. R. & Barron, A. B., 17 Mar 2015, In : *Proceedings of the National Academy of Sciences of the United States of America*. 112, 11, p. 3427-3432 6 p.

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**Insect reward systems: Comparing flies and bees**

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**Cocaine affects foraging behaviour and biogenic amine modulated behavioural reflexes in honey bees**

Sovik, E., Even, N., Radford, C. W. & Barron, A. B., 2014, In : *PeerJ*. 2, p. 1-12 12 p., e662.

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Scheiner, R., Toteva, A., Reim, T., Søvik, E. & Barron, A. B., 2014, In : *Frontiers in Physiology*. 5, p. 1-8 8 p., 116.

**Epigenomics and the concept of degeneracy in biological systems**

Maleszka, R., Mason, P. H. & Barron, A. B., 2014, In : *Briefings in Functional Genomics*. 13, 3, p. 191-202 12 p., elt050.

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**Invertebrate models in addiction research**

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**A comparison of digital gene expression profiling and methyl DNA immunoprecipitation as methods for gene discovery in honeybee (*Apis mellifera*) behavioural genomic analyses**

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**Invertebrate learning and cognition: Relating phenomena to neural substrate**

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**Altruistic behavior by egg-laying worker honeybees**

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**Cocaine tolerance in honey bees**

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**Modelling food and population dynamics in honey bee colonies**

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**Neural mechanisms of reward in insects**

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**Effect of honey bee queen mating condition on worker ovary activation**

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McQuillan, H. J., Barron, A. B. & Mercer, A. R., Oct 2012, In : *Journal of Comparative Physiology A: Neuroethology, Sensory, Neural, and Behavioral Physiology*. 198, 10, p. 753-761 9 p.

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Comba, L., Corbet, S. A., Barron, A., Bird, A., Collinge, S., Miyazaki, N. & Powell, M., Jan 1999, In : *Annals of Botany*. 83, 1, p. 73-86 14 p.

### **Pre-exposure affects the olfactory response of *Drosophila melanogaster* to menthol**

Barron, A. B. & Corbet, S. A., 1999, In : *Entomologia Experimentalis et Applicata*. 90, 2, p. 175-181 7 p.

### **Overwintering survival in the seven spot ladybird, *Coccinella septempunctata* (Coleoptera:Coccinellidae)**

Barron, A. & Wilson, K., 1998, In : *European Journal of Entomology*. 95, 4, p. 639-642 4 p.

## **Awards**

## **Projects**

### **Analysing the neural mechanisms of animal cognition and behaviour**

Narendra, A., Barron, A., Cheng, K., Hart, N. & Cornish, J.

1/01/16 → 31/12/16

### **An analysis of the distribution of degrees of intelligence across animal groups**

Barron, A.

4/06/18 → 3/06/20

### **A new understanding of complex systems through study of self-assembled swarm architecture in ants**

Reid, C. & Barron, A.

30/06/17 → ...

### **Automated Fluorescence Stereo Microscope**

Narendra, A., Taylor, P., Lindsay, S., Barron, A., Herberstein, M., Hart, N., Williamson, J., Griffith, S., Whiting, M., Brock, G. & Jacob, D.

1/01/17 → ...

### **Biomolecular Discovery and Design Research Centre**

Packer, N., Paulsen, I., Nevalainen, H., Haynes, P., Molloy, M., Atwell, B., Barron, A., Beggs, P., Bergquist, P. L., Brown, L., Cornish, J., Chung, R., De Deene, Y., Garcia-Bennett, A., Gillings, M., Goodchild, A., Guillemin, G., Hallinan, J., Hose, G., Jaschke, P., Mabbutt, B., Raftos, D., Ranganathan, S., Sofronov, G., Sunna, A., Tetu, S., Andersen, M., Willows, R., Ahn, C., Breen, E., Campbell, M., Care, A., Cordina, N., Curach, N., Everest Dass, A., Elbourne, L., Goold, H., Hassan, K., Kautto, L., Krisp, C., Kroukamp, H., Lee, A., Lin, C., Mackie, A., McKay, M., McQuade, L., Mirzaei, M., Mohamedali, A., Ostrowski, M., Parker, L., Pascovici, D., Penesyan, A., Shah, B., Sun, A., Thompson, E. & Williams, T.

1/01/17 → ...

### **Biosecurity Futures Research Centre**

Taylor, P., Gillings, M., Raftos, D., Leishman, M., Sunna, A., Bishop, M., Barron, A., Beattie, A., Beaumont, L., Connally, R., Grech, A., Griffith, S., Guillemin, G., Hughes, L., Inglis, D., Jamie, I., Jamie, J., Lu, Y., Morelli De andrade, R., Nevalainen, H., Park, S. J., Perez, J., Power, M., Ranjan, R. & Vickery, K.

1/07/15 → ...

### **Centre for NeuroRobotics plan A': matching funding for an international collaborative project**

Barron, A.

1/07/19 → 30/06/22

### **Combined gas chromatography/ electroantennogram detector for insect olfaction research**

Taylor, P., Jamie, I., Herberstein, M., Kemp, D., Barron, A., Jamie, J., Akter, H., Adnan, S., Moadeli, T., Akter, K., Bakshi, D. & MQRES, M.

1/01/15 → 31/12/15

**Comprehending and modelling the workings of the animal brain**

Barron, A., MQRES (International), M. (. & MQRES, M.

1/06/15 → ...

**MQRIS Small: Enhancing electrochemical recording techniques in the animal research facility**

Cornish, J., Baracz, S., McMullan, S., Goodchild, A., Barron, A. & Hildreth, C.

1/01/18 → 31/12/18

**Exploring neurogenomic adaptations to repeated cocaine exposure in honey bees**

Barron, A.

22/10/08 → 21/10/09

**Gene expression analysis system**

Barron, A., Cheng, K., Taylor, P., Nelson, X. & Pryke, S.

1/01/08 → 31/12/08

**High quality ultramicrotome for precision specimen preparation for optical and electron microscopy**

Deng, W., Chung, R., Nevalainen, H., Phillips, J. K., McMorran, B. & Barron, A.

1/01/14 → 31/12/14

**High Throughput Molecular Sample Processing Facility**

Zakoshanski, I., Paulsen, I., Whiting, M., Power, M., Lanfear, R., Barron, A., Westoby, M., Warren, D., Van Sluyter, S., Clarke, T., Wunderlin, T., Ostrowski, M., Mazard, S. & Tetu, S.

4/02/15 → 31/12/15

**Integrative analysis of honey bee colony function and performance (58-5342-3-004F: Developing the use of sensors to model bee colony dynamics and to monitor bee health, productivity and performance)**

Barron, A. & Meikle, W.

1/07/13 → ...

**Invertebrate olfaction facilities**

Taylor, P., Herberstein, M., Barron, A., Weldon, C., Nelson, X. & Prenter, J.

1/01/09 → 31/12/09

**Knowing what you don't know: analyzing the biology of metacognition and uncertainty in a simple model system**

Perry, C., Barron, A. & Perry, C.

1/06/11 → 1/06/14

**Macquarie University Species Spectrum Research Center**

Herberstein, M., Gillings, M., Jacob, D., Saintilan, N., Barron, A., Westoby, M., Sofronov, G. & Tetu, S.

1/01/17 → ...

**Microbalance for integrative behavioral research**

Taylor, P., Barron, A. & Weldon, C.

1/01/10 → 31/12/10

**Molecular memory: how DNA methylation contributes to spatial memory**

Maleszka, R., Cornish, J. & Barron, A.

1/01/10 → 31/12/12

**Navigating brains: the neurobiology of spatial cognition**

Cheng, K., Zeil, J., Narendra, A., Barron, A., Wehner, R. & MQRES, M.

30/06/15 → ...

**Navigating brains: the neurocomputational foundations of insect spatial cognition**

Cheng, K., Barron, A. & Wehner, R.

1/01/14 → 31/12/14

**Neural adaptations for social harmony in bees**

Barron, A.

1/01/08 → 31/12/08

**Operant behavioural chambers for rat research**

Cornish, J., Clemens, K., Staples, L., Goodchild, A., Haynes, P., Barron, A., Baillie, A. & Pilowsky, P.

1/01/11 → 31/12/11

**Origin of Consciousness and its Computational Applications in Machines (MQ Discretionary Scheme)**

Barron, A., Klein, C., Balleine, B. W., Bell, G., Millford, M. & Van Swinderen, B.

12/02/18 → 31/12/18

**Protecting vulnerable Australian honey bees**

Barron, A.

25/07/17 → ...

**The bionic bee brain**

Barron, A.

19/06/15 → 24/08/15

**The genomic response to colony disease stress in honey bees**

Barron, A. & Gillings, M.

1/07/12 → 30/06/14

**The molecular and cellular basis the memory in the honey bee**

Barron, A.

1/08/09 → 30/07/11

**Towards a Bionic Brain**

Barron, A.

30/04/14 → 25/12/14

**Understanding colony collapse: a social analysis of honey bee colony failure**

Barron, A.

1/07/11 → 31/12/14

**Understanding the functions of neural circuit changes in visual navigation**

Kamhi, F., Narendra, A. & Barron, A.

1/01/17 → ...

**Vulnerability to cocaine use: discovering common mechanisms conserved across animal phyla**

Barron, A., Cornish, J. & Maleszka, R.

1/01/09 → 31/12/12