
ALEXANDER W. JOHNSON

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EDUCATION

Upper Second Class BSc. (Hons.) Psychology, Coventry University, October 1999 to June 2002.

Ph.D. Psychology (Behavioral Neuroscience), Cardiff University, October 2002 to April 2006.
Title: An evaluation of motivational processing in mice with a genetic deletion of the GluR-1 AMPA receptor subunit. *Supervisor:* Professor M.A. Good.

Optogenetics Innovation Laboratory (OIL Workshop), Stanford University, June 2012.

EMPLOYMENT HISTORY

Post-doctoral Research Fellow (2005-2009): Neurogenetics and Behavior Center, and Department of Psychological and Brain Sciences, Johns Hopkins University.

Associate Research Scientist (2009-2012): Department of Psychological and Brain Sciences, Johns Hopkins University.

Assistant Professor (2012-present): Department of Psychology, Michigan State University.

PROFESSIONAL ACTIVITIES AND MEMBERSHIPS

MEMBER:

Society for Neuroscience, 2004-present.
Society for the Study of Ingestive Behavior, 2009-present.
Pavlovian Society, 2010-present.
Eastern Psychological Society, 2012.

AD-HOC REVIEWER:

Journal of Neuroscience, 2007.
Learning and Memory, 2007-present.
Biological Psychiatry, 2009.
The Israel Science Foundation Review, 2009-present.
Behavioural Brain Research, 2010.
Cerebral Cortex, 2010.
Wellcome Trust Scientific Review, Neuroscience and Mental Health, United Kingdom, 2010.
Neuropsychopharmacology, 2010-present.
Appetite, 2011-present.
Marsden Fund Referee, New Zealand, 2011.
Behavioral Neuroscience, 2011-present.
Journal of Experimental Psychology: Animal Behavior Processes, 2012.

HONORS AND AWARDS

Experimental Psychology Travel Assistance award, 2004.
Society for the Study of Ingestive Behavior, New Investigator Award, 2009.

RESEARCH SUPPORT

Active

The influence of cocaine on outcome-mediated responding: DA029764

Principal Investigator (Johnson)

04/01/2011-03/31/2013

NIH/NIDA

US \$50,000/yr direct

The major goal of this project is to examine the neural basis of the drug-induced transition from goal-directed to habitual behavior following extensive cocaine exposure.

Past

The role of MCH in food intake and procurement: DK-084415

Principal Investigator (Johnson)

08/01/2010-07/31/2012

NIH/NIDDK

US \$125,000/yr direct

The major goal of this project is to determine roles of melanin concentrating hormone (MCH) in the control of ingestive behavior and food procurement.

PUBLICATIONS (*corresponding author)

1. **Johnson, A.W.**, Bannerman, D., Rawlins, N., Sprengel, R., & Good, M.A. (2005). Impaired outcome-specific devaluation of instrumental responding in mice with a targeted deletion of the AMPA receptor GluR-1 subunit. *Journal of Neuroscience*, 25(9): 2359-65.
2. ***Johnson, A.W.**, Bannerman, D., Rawlins, N., Sprengel, R., & Good, M.A. (2007). Targeted deletion of the GluR-1 AMPA receptor subunit dissociates general motivational and incentive properties of rewards on components of Pavlovian instrumental transfer and instrumental heterogeneous chain. *Behavioral Neuroscience*, 121(6): 1192-202.
3. **Johnson, A.W.**, Humeau, Y., Reisel, D., Borchardt, T., Jensen, V., Gebhardt, C., Bosch, V., Gass, P., Bannerman, D., Good, M.A., Hvalby, O., Sprengel, R., & Luthi, A. (2007). A pathway-specific function for different AMPA receptor subunits in amygdala LTP and fear conditioning. *Journal of Neuroscience*, 27(41):10947-56.
4. ***Johnson, A.W.**, Crombag, H.S., Takamiya, K., Baraban, J.M., Holland, P.C., Hagan, R.L., & Reti, I. (2007). A selective role for neuronal activity regulated pentraxin in the processing of sensory-specific incentive value. *Journal of Neuroscience*, 27(49):13430-5.
5. ***Johnson, A.W.**, Chen, X., Crombag, H.S., Zhang, C., Smith, D.R., Shokat, K.M., Gallagher, M., Holland, P.C., & Ginty, D.D. (2008). The BDNF receptor Trk-B is critical to the acquisition but not expression of conditioned incentive value. *European Journal of Neuroscience*, 28: 997-1002.
6. Crombag, H.S., Dickson, M., Dinenna, M., **Johnson, A.W.**, Perin, M., Holland, P.C., Baraban, J.M., & Reti, I.M. (2009). Narp deletion blocks extinction of morphine place preference conditioning. *Neuropsychopharmacology*, 34: 857-66.

7. ***Johnson, A.W.**, Gallagher, M., & Holland, P.C. (2009). The basolateral amygdala is critical to the expression of Pavlovian and instrumental outcome-specific reinforcer devaluation effects. *Journal of Neuroscience*, 29:696-704.
8. ***Johnson, A.W.**, Canter, R., Gallagher, M., & Holland, P.C. (2009). Assessing the role of the growth hormone secretagogue receptor in motivational learning and food intake. *Behavioral Neuroscience*, 123: 1058-65.
9. Smith, D.R., Burruss, D.R., & ***Johnson, A.W.** (2009). An assessment of odor novelty and detection in 3 strains of mice. *Behavioural Brain Research*, 201: 22-8.
10. ***Johnson, A.W.**, Han, S., Blouin, A.M., Saini, J., Worley, P.F., During, M.J., Holland, P.C., Baraban, J.M., & Reti, I.M. (2010). Localized disruption of Narp in medial prefrontal cortex blocks reinforcer devaluation performance. *Learning and Memory*, 17: 620-626.
11. ***Johnson, A.W.**, Sherwood, A., Smith, D.R., Wosiski-Kuhn, M., Gallagher, M., Holland, P.C. (2010). An analysis of licking microstructure in three strains of mice. *Appetite*, 54: 320-30.
12. Crombag, H.S., **Johnson, A.W.**, Zimmer, A., & Holland, P.C. (2010). Deficits in sensory-specific devaluation task performance following genetic deletions of cannabinoid (CB1) receptor. *Learning and Memory*, 17: 807-11.
13. Allman, M.J., DeLeon, I.G., Holland, P.C., Cataldo, M.F., & ***Johnson, A.W.** (2010). Examining the reinforcer-specificity of Pavlovian-to-instrumental transfer in humans following reinforcer devaluation. *Journal of Experimental Psychology: Animal Behavior Processes*, 36: 402-8.
14. Reti, I.M., Blouin, A.M., Worley, P.F., Holland, P.C., **Johnson, A.W.**, & Baraban, J.M. (2011). Mediating the Effects of Drug Abuse: The Role of Narp in Synaptic Plasticity. *Institute for Laboratory Animal Research*, 52(3): 251-272.
15. ***Johnson, A.W.**, Crombag, H.S., Smith, D.R., & Ramanan, N. (2011). Effects of serum response factor (SRF) deletion on conditioned reinforcement. *Behavioural Brain Research*, 220: 312-318.
16. ***Johnson, A.W.**, & Gallagher, M. (2011). Greater effort boosts the affective taste properties of food. *Proceedings of the Royal Society B: Biological Sciences*, 278(1711): 1450-1456.
 - Press release (Royal Society)
 - Selected media: TIME magazine, Discovery News, Scientific America, Los Angeles Times, Baltimore Sun, Daily Express, Sunday Time, Daily Telegraph.
17. ***Johnson, A.W.** (2012). Dietary manipulations influence sucrose acceptance in diet induced obese mice. *Appetite*, 58: 215-221.
18. Sherwood, A., Wosiski-Kuhn, M., Nguyen, T., Holland, P.C., Layake, B., Adamantidis, A., **Johnson, A.W.** (2012) The role of melanin concentrating hormone in conditioned reward learning. *European Journal of Neuroscience*, 36(8): 3126-3133.
19. Blouin, A.M., Han, S., Pearce, A.M., Cheng, K., **Johnson, A.W.**, Wang, C., During, M.J., Holland, P.C., Shaham, Y., Baraban, J.M., Reti, I.M. Role of medial prefrontal cortex Narp in extinction of morphine conditioned place preference. Accepted *Learning and Memory*.

INVITED TALKS

1. **Johnson, A.W.** Motivational Learning, from actions to autonomy. Presented at the University of New South Wales, Colloquium Series, December 2007, Sydney, Australia.
2. **Johnson, A.W.** Ghrelin alters the appetitive and consummatory response to learned cues associated with food. Presented at the Society for the Study of Ingestive Behavior 17th Annual Meeting, August 2009, Portland, Oregon.
3. **Johnson, A.W.** The BDNF receptor TrkB is critical for the acquisition of conditioned incentive value. Presented at American College of Neuropsychopharmacology, Neurotrophins to the rescue symposium, December 2009, Hollywood, Florida.
4. **Johnson, A.W.** Loss of behavioral control: Prefrontal dysfunction in addiction and mental illness. Presented at the University of Pittsburgh Department of Psychiatry, Translational Research Series, June 2011, Pittsburgh, Pennsylvania.
5. **Johnson, A.W.** Psychobiological mechanisms involved in cue-induced overeating. Presented at the University of Alabama Birmingham, Department of Psychology, Colloquium Series Spring 2012, March 2012, Birmingham, Alabama.
6. **Johnson, A.W.** Neurobiological circuitry modulating feeding and reward. Presented at the University of Maryland Baltimore, Department of Pharmacology and Experimental Therapeutics, Colloquium Series, April 2012, Baltimore, Maryland.

CONFERENCE PRESENTATIONS & PUBLISHED ABSTRACTS

1. **Johnson, A.W.**, & Good, M. Fear conditioning impairments in GluR-1^{-/-} mice. Presented at the 8th Annual Associative Learning Symposium, April 2004, Gregynog, Wales.
2. **Johnson, A.W.**, Bannerman, D., Rawlins, N., Sprengel, R., & Good, M. Mice with a targeted deletion of the GluR-1 subunit of the AMPA receptor show impaired processing of the affective/motivational value of a primary reinforcer. Presented at Society for Neuroscience 34th Annual Meeting, October 2004, San Diego, California.
3. Good, M., **Johnson, A.W.**, Bannerman, D., Rawlins, N., Sprengel, R., & Good, M. Impaired contextual and cued fear conditioning in mice with a targeted deletion of the GluR-A subunit. Presented at Society for Neuroscience 34th Annual Meeting, October 2004, San Diego, California.
4. **Johnson, A.W.**, & Good, M. Disruption of reinforcer representations in GluR-1^{-/-} mice. Presented at the 9th Annual Associative Learning Symposium, March 2005, Gregynog, Wales.
5. **Johnson, A.W.**, & Good, M. An examination of motivational processing in gene-targeted mice lacking the GluR-1 subunit of the AMPA receptor. Presented at the 4th annual Molecular and Cellular Cognition Society Meeting, November 2005, Washington D.C.
6. **Johnson, A.W.**, Schmidt, M.J., Smith, D.D., Gallagher, M., & Ginty D.D. The role of the BDNF receptor Trk-B on the acquisition and expression of conditioned incentive value. Presented at Society for Neuroscience 36th Annual Meeting, October 2006, Atlanta, Georgia.
7. Johnson, J.J., **Johnson, A.W.**, Schmidt, M.J., Ramanan, N., Gallagher, M., & Ginty, D.D. The role of serum response factor in incentive learning. Presented at Society for Neuroscience 36th Annual Meeting, October 2006, Atlanta, Georgia.

8. Saddoris, M., **Johnson, A.W.**, Schmidt, M.J., Smith, D.R., Takamiya, I.M., Reti, R.L., Hujanir, R.L., & Gallagher, M. Innovation in the assessment of olfactory-based behavior in mice. Presented at Society for Neuroscience 36th Annual Meeting, October 2006, Atlanta, Georgia.
9. Sherwood, A.J., **Johnson, A.W.**, Smith, D.R., & Gallagher, M. Innovation in the assessment of gustatory-based behavior in mice. Presented at Society for Neuroscience 36th Annual Meeting, October 2006, Atlanta, Georgia.
10. **Johnson, A.W.**, Gallagher M., & Holland, P.C. Examining the role of the basolateral amygdala in the expression of reinforcer devaluation. Presented at Society for Neuroscience 37th Annual Meeting, November 2007, San Diego, California.
11. Crombag, H.S., Galarce, E., **Johnson, A.W.**, Johnson, J., Zimmer, A., & Holland, P.C. Normal Pavlovian modulation of appetitive responding is disrupted in cannabinoid receptor (CB1) knockout mice. Presented at Society for Neuroscience 37th Annual Meeting, November 2007, San Diego, California.
12. Holland, P.C., Galarce, E., **Johnson, A.W.**, Johnson, J., Zimmer, A., & Crombag, H.C. Deficits in outcome-specific devaluation of instrumental responding following cannabinoid CB1 receptor knockout. Presented at Society for Neuroscience 37th Annual Meeting, November 2007, San Diego, California.
13. Reti, I.M., Crombag, H.S., Sutton, J., **Johnson, A.W.**, Johnson, J., Takamiya, K., Hujanir, R., Baraban, J.M., Gallagher, M., & Holland, P.C. The role of neuronal activity regulated pentraxin (NARP) in motivational learning. Presented at Society for Neuroscience 37th Annual Meeting, November 2007, San Diego, California.
14. Smith, D.R., Crombag, H.S., Gallagher, M., Holland, P.C., Sherwood, A., & **Johnson, A.W.** Evaluating the effects of cocaine exposure on goal-directed and habitual responding. Presented at Society for Neuroscience 37th Annual Meeting, November 2007, San Diego, California.
15. Crombag, H.S., Johnson, J.J., Fienberg, P., Greengard, P.C., Holland, P.C., **Johnson, A.W.**, & Gallagher, M. A necessary role for Darpp-32 in incentive salience attribution. Presented at Society for Neuroscience 38th Annual Meeting, November 2008, Washington, D.C.
16. **Johnson, A.W.**, Gallagher, M., & Holland, P.C. Examining the role of effort-related functions on reward palatability and incentive learning. Presented at Society for Neuroscience 38th Annual Meeting, November 2008, Washington, D.C. Poster was included in SFN 2008 media materials.
17. **Johnson, A.W.**, Han, S., Saini, J., During, M.J., Holland, P.C., Baraban, J.M., Gallagher, M., Holland, P.C., & Reti, I.M. Expression of neuronal activity regulated pentraxin in medial prefrontal cortex is necessary for reinforcer devaluation. Presented at Society for Neuroscience 39th Annual Meeting, November 2009, Chicago, Illinois.
18. Smith, D.R., **Johnson, A.W.**, Polster, D., & Gallagher, M. An assessment of ingestive behavior in obese mice using licking microstructure. Presented at Society for Neuroscience 39th Annual Meeting, November 2009, Chicago, Illinois.
19. **Johnson, A.W.**, Gallagher, M., & Holland, P.C. An analysis of licking microstructure in diet-induced obese mice. Presented at the Society for the Study of Ingestive Behavior 18th Annual Meeting, August 2010, Pittsburgh, Pennsylvania.
20. Jarro-peled, H., Niwa, M, **Johnson, A.W.**, Ibi, D., Smith, D.R., Huang, B., Pou, S., Foss, C.A., Pomper, M.G., Nabeshima, T., Gallagher, M., Plentnikov, M.V., Yamada, K., Sawa. Postnatal expression of a dominant negative DISC1 transgene under the α CaMKII promoter is sufficient to elicit several endophenotypes relevant to schizophrenia, which are augmented by a neonatal environmental

stressor. Presented at Society for Neuroscience 40th Annual Meeting, November 2010, San Diego, California.

21. Blouin, A.M., Han, S., Pearce, A.M., Cheng, K., **Johnson, A.W.**, Holland, P.C., Baraban, J.M., Reti, I.M. Viral-mediated expression of Narp in the medial prefrontal cortex rescues morphine conditioned place preference in the Narp KO mouse. Presented at Society for Neuroscience 40th Annual Meeting, November 2010, San Diego, California.

22. Sherwood, A., Holland, P.C., **Johnson, A.W.** The role of Melanin Concentrating Hormone in reward learning. Presented at Society for the Study of Ingestive Behavior 19th Annual Meeting, July 2011, Clearwater, Florida.

23. **Johnson, A.W.** Melanin Concentrating Hormone influences cue-driven food intake under non-deprived conditions. Presented at Society for the Study of Ingestive Behavior 19th Annual Meeting, July 2011, Clearwater, Florida.

24. Blouin, A.M., Han, S., Pearce, A.M., Cheng, K., Lee, J.J., **Johnson, A.W.**, During, M.J., Holland, P.C., Baraban, J.M., Reti, I.M. Narp projections from the medial prefrontal cortex mediate extinction of morphine conditioned place preference. Presented at Society for Neuroscience 41st Annual Meeting, November 2011, Washington D.C.

25. Gallagher, M., **Johnson, A.W.**, Smith, D.R., Jaaro-peled, H., Sawa, A. Assessments of behavioral flexibility, goal-directed action, and reward hedonics in a mouse model of schizophrenia. Presented at Society for Neuroscience 41st Annual Meeting, November 2011, Washington D.C.

26. **Johnson, A.W.**, Sherwood, A., Gallagher, M., Holland, P.C. Melanin Concentrating Hormone (MCH) influences cue-driven food intake under conditions of satiety. Presented at Society for Neuroscience 41st Annual Meeting, November 2011, Washington D.C.

27. Sherwood, A.J., Holland, P.C., Gallagher, M., **Johnson, A.W.** The role of Melanin Concentrating Hormone (MCH) in reward learning. Presented at Society for Neuroscience 41st Annual Meeting, November 2011, Washington D.C.

28. Sherwood, A.J., Holland, P.C., **Johnson, A.W.** Disruption of goal-directed responding in rats following withdrawal from cocaine. Presented at Society for Neuroscience 42nd Annual Meeting, October 2012, New Orleans, L.A.

COURSES TAUGHT

Research Methods and Design

Cardiff University (2003-2004): Introductory course to research methods and design in psychology.

Introduction to Neuroscience

Cardiff University (2004): Topics in neuroscience of learning and behaviour.

The Neurobiology of Food Intake and Overeating

Johns Hopkins University (2010-present): This intersession course focused on topics such as the neurobiology of learning and behaviour and the role of central and peripheral mechanisms in food intake.

The Neurobiology of Food Intake and Overeating

Michigan State University (Fall Semester 2012): This advanced undergraduate course examines the underlying basis of energy (food) intake, its expenditure; learned and unlearned physiological and neurological mechanisms that drive food intake and overeating, and vulnerabilities to obesity.