

## **NAME AND CONTACT DETAILS**

Andrew Harkin  
Associate Professor of Pharmacology,  
Trinity College Institute of Neuroscience,  
Lloyd Building,  
Trinity College,  
Dublin 2.

**Ph:** +353-1-8968575

**E-mail:** [aharkin@tcd.ie](mailto:aharkin@tcd.ie)

## **CAREER PROFILE**

### ***Education***

**1994-1998:** Ph.D. Department of Pharmacology, National University of Ireland, Galway

**1990-1994:** B.Sc., National University of Ireland, Galway

### ***Employment***

**2010-Present:** Associate Professor of Pharmacology, School of Pharmacy and Pharmaceutical Sciences & Principal Investigator Trinity College Institute of Neuroscience

**2005-2010:** Lecturer in Pharmacology, Trinity College Dublin

**2004-2005:** Lecturer in Pharmacology, School of Pharmacy, University College Cork

**2003-2004:** Lecturer in Pharmacology, Department of Pharmacology, NUI, Galway

**2001-2003:** HRB Research Fellow, Department of Pharmacology, NUI, Galway.

Post-doctoral researcher, Laboratory of Safety Pharmacology, Lundbeck, Copenhagen

**1997-2001:** Post-doctoral Researcher, Department of Pharmacology, NUI, Galway  
funded by PRTL Higher Education Authority (HEA)

**1996:** Researcher, Department of Psychiatry, University of Mississippi Medical Center,  
Jackson, Mississippi, USA

## **HISTORY OF MENTORING AND SUPERVISION**

***Supervision history:*** 3 post-doctoral researchers, 14 PhD students

Taught MSc research dissertations (MSc Neuroscience, TCD; MSc Molecular Medicine TCD;  
MSc Pharmaceutical Sciences; MSc Neuropharmacology, NUI, Galway).

***Current research group:*** 1 post-doctoral scientist, supervising 7 PhD students

## **RESEACRH FUNDING**

2013-2017: Marie Curie Initial Training Networks (ITN): FP7-PEOPLE-2012-ITN  
Brain Imaging Return to Health "reBIRTH" (<http://www.rbirth.eu/>)  
The r'BIRTH consortium is a Marie Curie Initial Training Network

2008-2013: FP7- HEALTH-2007-2.2.1-8: From mood disorders to experimental models  
Early diagnosis, treatment and prevention of mood disorders targeting the  
activated inflammatory response system. [Acronym: MOODINFLAME ] Type  
of funding: A collaborative, large-scale focused research project.

HRB Research Project Grants

"Neuronal nitric oxide synthase: a novel target for antidepressant activity"  
Caffeine exacerbates the acute toxicity of MDMA ("ecstasy"): A role for dopamine?  
Science Foundation Ireland, Research Grant  
Antidepressant efficacy following methylenedioxymethamphetamine-induced  
serotonin loss

Research collaboration with Boehringer Ingelheim CNS Discovery Research on the analysis of  
tryptophan catabolites in depressed patients.

## **OTHER INFORMATION**

Principal Investigator and head of Neuropsychopharmacology research group in TCIN  
focused on bridging neuroscience to the pharmacological treatment of psychiatric and  
neurological disorders. The group collaborates widely with a variety of academic and  
industrial partners on fundamental and clinical projects.

Reviewer for international grant awarding bodies including the German Research  
Foundation, Estonian Research Council and National Science Centre, Poland.

Member of review editorial boards of a number of scientific journals including Brain  
Behavior and Immunity, Frontiers in Behavioural Neuroscience and Acta Neuropsychiatrica  
and regular reviewer for international neuroscience and pharmacology journals.

Frequently external examiner for PhD degrees at home and abroad.

## **AWARDS AND DISTINCTIONS**

Recent invited talks: Federation of European Neurosciences (FENS) ReBIRTH symposium  
Copenhagen 2016; European Neuropsychopharmacology (ECNP) Congress Vienna, 2016;  
CINP thematic meeting on Stress and Depression Dublin, 2015.

2016: Deputy Director of the Trinity College Institute of Neuroscience

2015-present: Chair of the Trinity College Animal Research Ethics Committee

2008-2012: Director of Teaching and Learning (postgraduate), School of Pharmacy &  
Pharmaceutical Sciences, Trinity College Dublin.

2010: Elected to Fellowship, Trinity College Dublin

2005: Awarded the Preclinical Certificate in Psychopharmacology from the British  
Association for Psychopharmacology (BAP)

2004: Collegium Internationale Neuro-Psychopharmacologicum Young Investigator Award

2001: Recipient of a Health Research Board Fellowship (Career development award).

1994: Recipient of post graduate teaching Fellowship from NUI, Galway.

## PUBLICATIONS

- \* Sherwin E, Gigliucci V, Harkin A. (2017) Regional specific modulation of neuronal activation associated with nitric oxide synthase inhibitors in an animal model of antidepressant activity. *Behav Brain Res*. 316:18-28.
- \* O'Neill E, Kwok B, Day JS, Connor TJ, Harkin A. (2016) Amitriptyline protects against TNF- $\alpha$ -induced atrophy and reduction in synaptic markers via a Trk-dependent mechanism. *Pharmacol Res Perspect*. 4(2):e00195. doi: 10.1002/prp2.195.
- \* Gormley S, Rouine J, McIntosh A, Kerskens C, Harkin A. (2016) Glial fibrillary acidic protein (GFAP) immunoreactivity correlates with cortical perfusion parameters determined by bolus tracking arterial spin labelling (bt-ASL) magnetic resonance (MR) imaging in the Wistar Kyoto rat. *Physiol Behav*. 160:66-79.
- \* Ryan KM, Griffin ÉW, Ryan KJ, Tanveer R, Vanattou-Saifoudine N, McNamee EN, Fallon E, Heffernan S, Harkin A, Connor TJ. (2016) Clenbuterol activates the central IL-1 system via the  $\beta$ -adrenoceptor without provoking inflammatory response related behaviours in rats. *Brain Behav Immun*. 56:114-29.
- Maria NI, van Helden-Meeuwsen CG, Brkic Z, Paulissen SM, Steenwijk EC, Dalm VA, van Daele PL, Martin van Hagen P, Kroese FG, van Roon JA, Harkin A, Dik WA, Drexhage HA, Lubberts E, Versnel MA. (2016) Association of Increased Treg Cell Levels With Elevated Indoleamine 2,3-Dioxygenase Activity and an Imbalanced Kynurenine Pathway in Interferon-Positive Primary Sjögren's Syndrome. *Arthritis Rheumatol*. 68(7):1688-99.
- \* Hughes MM, Connor TJ, Harkin A. (2016) Stress-Related Immune Markers in Depression: Implications for Treatment. *Int J Neuropsychopharmacol*. pii: pyw001. doi: 10.1093/ijnp/pyw001. [Epub ahead of print] Review.
- \* O'Farrell K, Harkin A. (2015) Stress-related regulation of the kynurenine pathway: Relevance to neuropsychiatric and degenerative disorders. *Neuropharmacology*. pii: S0028-3908(15)30200-8. doi: 10.1016/j.neuropharm.2015.12.004. [Epub ahead of print] Review.
- Morgese MG, Colaianna M, Mhillaj E, Zotti M, Schiavone S, D'Antonio P, Harkin A, Gigliucci V, Campolongo P, Trezza V, De Stradis A, Tucci P, Cuomo V, Trabace L. (2015) Soluble beta amyloid evokes alteration in brain norepinephrine levels: role of nitric oxide and interleukin-1. *Front Neurosci*. 9:428. doi: 10.3389/fnins.2015.00428.
- \* Doucet MV, O'Toole E, Connor T, Harkin A. (2015) Small-molecule inhibitors at the PSD-95/nNOS interface protect against glutamate-induced neuronal atrophy in primary cortical neurons. *Neuroscience*. 301:421-38.
- Murray C, Griffin ÉW, O'Loughlin E, Lyons A, Sherwin E, Ahmed S, Stevenson NJ, Harkin A, Cunningham C. (2015) Interdependent and independent roles of type I interferons and IL-6 in innate immune, neuroinflammatory and sickness behaviour responses to systemic poly I:C. *Brain Behav Immun*. 48:274-86.
- \* Rouine J, Kelly ME, Jennings-Murphy C, Duffy P, Gorman I, Gormley S, Kerskens CM, Harkin A. (2015) Investigation of the mechanisms mediating MDMA "Ecstasy"-induced increases in cerebrocortical perfusion determined by btASL MRI. *Psychopharmacology (Berl)*. 232(9):1501-1513.
- Frodl T, Carballedo A, Frey EM, O'Keane V, Skokauskas N, Morris D, Gill M, Hughes MM, Harkin A, Connor T. (2014) Expression of glucocorticoid inducible genes is associated with reductions in

cornu ammonis and dentate gyrus volumes in patients with major depressive disorder. *Dev Psychopathol.* 26(4 Pt 2):1209-17.

Cuartero MI, Ballesteros I, de la Parra J, [Harkin A](#), Abautret-Daly A, Sherwin E, Fernández-Salguero P, Corbí AL, Lizasoain I, Moro MA. (2014) L-kynurenine/aryl hydrocarbon receptor pathway mediates brain damage after experimental stroke. *Circulation.* 130(23):2040-2051.

\* Gigliucci V, Gormley S, Gibney S, Rouine J, Kerskens C, Connor TJ, [Harkin A](#). (2014) Characterisation of the antidepressant properties of nitric oxide synthase inhibitors in the olfactory bulbectomised rat model of depression. *Eur Neuropsychopharmacol.* 24(8):1349-1361.

O'Donovan S, Dalton V, [Harkin A](#), McLoughlin DM. (2014) Effects of brief pulse and ultrabrief pulse electroconvulsive stimulation on rodent brain and behaviour in the corticosterone model of depression. *Int J Neuropsychopharmacol.* 17(9):1477-1486.

\* Gibney SM, Fagan EM, Waldron AM, O'Byrne J, Connor TJ, [Harkin A](#). (2014) Inhibition of stress-induced hepatic tryptophan 2,3-dioxygenase exhibits antidepressant activity in an animal model of depressive behaviour. *Int J Neuropsychopharmacol.* 17(6):917-928.

\* Day JS, O'Neill E, Cawley C, Aretz NK, Kilroy D, Gibney SM, [Harkin A](#), Connor TJ. (2014) Noradrenaline acting on astrocytic  $\beta_2$ -adrenoceptors induces neurite outgrowth in primary cortical neurons. *Neuropharmacology.* 77:234-248.

Pertl MM, Hevey D, Boyle NT, Hughes MM, Collier S, O'Dwyer AM, [Harkin A](#), Kennedy MJ, Connor TJ. (2013) C-reactive protein predicts fatigue independently of depression in breast cancer patients prior to chemotherapy. *Brain Behav Immun.* 34:108-119.

Ryan KJ, Griffin É, Yssel JD, Ryan KM, McNamee EN, [Harkin A](#), Connor TJ. (2013) Stimulation of central  $\beta_2$ -adrenoceptors suppresses NF $\kappa$ B activity in rat brain: a role for I $\kappa$ B. *Neurochem Int.* 63(5):368-378.

\* Rouine J, Gobbo OL, Campbell M, Gigliucci V, Ogden I, McHugh Smith K, Duffy P, Behan B, Byrne D, Kelly ME, Blau CW, Kerskens CM, [Harkin A](#). (2013) MDMA 'ecstasy' increases cerebral cortical perfusion determined by bolus-tracking arterial spin labelling (btASL) MRI. *Br J Pharmacol.* 69(5):974-987.

\* Gigliucci V, O'Dowd G, Casey S, Egan D, Gibney S, [Harkin A](#). (2013) Ketamine elicits sustained antidepressant-like activity via a serotonin-dependent mechanism. *Psychopharmacology (Berl).* 228(1):157-166.

\* Doucet MV, Levine H, Dev KK, [Harkin A](#). (2013) Small-molecule inhibitors at the PSD-95/nNOS interface have antidepressant-like properties in mice. *Neuropsychopharmacology.* 38(8):1575-1584.

Gibney SM, McGuinness B, Prendergast C, [Harkin A](#), Connor TJ. (2013) Poly I:C-induced activation of the immune response is accompanied by depression and anxiety-like behaviours, kynurenine pathway activation and reduced BDNF expression. *Brain Behav Immun.* 28:170-181.

Hughes MM, Carballedo A, McLoughlin DM, Amico F, [Harkin A](#), Frodl T, Connor TJ. (2012) Tryptophan depletion in depressed patients occurs independent of kynurenine pathway activation. *Brain Behav Immun.* 26(6):979-987.

\* Vanattou-Saïfoudine N, McNamara R, [Harkin A](#). (2012) Caffeine provokes adverse interactions with 3,4-methylenedioxymethamphetamine (MDMA, 'ecstasy') and related psychostimulants: mechanisms and mediators. *Br J Pharmacol.* 167(5):946-59.

Doucet MV, Harkin A, Dev KK. (2012) The PSD-95/nNOS complex: new drugs for depression? *Pharmacol Ther.* 133(2):218-229.

\* Vanattou-Saïfoudine N, Behan B, Harkin A. (2012) Dopamine D1 receptor-mediated intracellular responses in the hypothalamus after co-administration of caffeine with MDMA. *Basic Clin Pharmacol Toxicol.* 110(3):283-289.

\* Vanattou-Saïfoudine N, Gossen A, Harkin A. (2011) A role for adenosine A(1) receptor blockade in the ability of caffeine to promote MDMA "Ecstasy"-induced striatal dopamine release. *Eur J Pharmacol.* 650(1):220-228.

\* Gleeson LC, Ryan KJ, Griffin EW, Connor TJ, Harkin A. (2010) The  $\beta$ 2-adrenoceptor agonist clenbuterol elicits neuroprotective, anti-inflammatory and neurotrophic actions in the kainic acid model of excitotoxicity. *Brain Behav Immun.* 24(8):1354-1361.

\* Vanattou-Saïfoudine N, McNamara R, Harkin A. (2010) Mechanisms mediating the ability of caffeine to influence MDMA ('Ecstasy')-induced hyperthermia in rats. *Br J Pharmacol.* 160(4):860-877.

\* Vanattou-Saïfoudine N, McNamara R, Harkin A. (2010) Caffeine promotes dopamine D1 receptor-mediated body temperature, heart rate and behavioural responses to MDMA ('ecstasy'). *Psychopharmacology (Berl).* 211(1):15-25.

McNamee EN, Griffin EW, Ryan KM, Ryan KJ, Heffernan S, Harkin A, Connor TJ. (2010) Noradrenaline acting at beta-adrenoceptors induces expression of IL-1beta and its negative regulators IL-1ra and IL-1RII, and drives an overall anti-inflammatory phenotype in rat cortex. *Neuropharmacology.* 59(1-2):37-48.

McNamee EN, Ryan KM, Griffin EW, González-Reyes RE, Ryan KJ, Harkin A, Connor TJ. (2010) Noradrenaline acting at central beta-adrenoceptors induces interleukin-10 and suppressor of cytokine signaling-3 expression in rat brain: implications for neurodegeneration. *Brain Behav Immun.* 24(4):660-671.

O'Sullivan JB, Ryan KM, Harkin A, Connor TJ. (2010) Noradrenaline reuptake inhibitors inhibit expression of chemokines IP-10 and RANTES and cell adhesion molecules VCAM-1 and ICAM-1 in the CNS following a systemic inflammatory challenge. *J Neuroimmunol.* 220 (1-2):34-42.

\* Gigliucci V, Buckley KN, Nunan J, O'Shea K, Harkin A. (2010) A role for serotonin in the antidepressant activity of N<sup>G</sup>-Nitro-L-arginine, in the rat forced swimming test. *Pharmacol Biochem Behav.* 94(4):524-533.

O'Sullivan JB, Ryan KM, Curtin NM, Harkin A, Connor TJ. (2009) Noradrenaline reuptake inhibitors limit neuroinflammation in rat cortex following a systemic inflammatory challenge: implications for depression and neurodegeneration. *Int J Neuropsychopharmacol.* 12(5):687-99.

\* Durkin S, Prendergast A, Harkin A. (2008) Reduced efficacy of fluoxetine following MDMA ("Ecstasy")-induced serotonin loss in rats. *Prog Neuropsychopharmacol Biol Psych.* 32(8):1894-1901.

\* Connor TJ, Starr N, O'Sullivan JB, Harkin A. (2008) Induction of indolamine 2,3-dioxygenase and kynurenine 3-monooxygenase in rat brain following a systemic inflammatory challenge: a role for IFN-gamma? *Neurosci Lett.* 441(1):29-34.

Roche M, Harkin A, Kelly JP. (2007) Chronic fluoxetine treatment attenuates stressor-induced changes in temperature, heart rate, and neuronal activation in the olfactory bulbectomized rat. *Neuropsychopharmacology.* 32(6):1312-1320.