

Dr Catriona J. Cunningham
EPSRC Doctoral Prize Fellow
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Education

University of Manchester: September 2014 – 2018

EPSRC and MRC CDT Regenerative Medicine PhD Studentship
Passed with minor corrections

Courses: Cell Matrix Biology, Biology of Regenerative Medicines, Innovation and Commercialisation of Research, Bioreactor and Growth Environments for Tissue Engineering (Keele University)

University of Aberdeen: September 2008 – June 2014

Medicine MBChB

Distinction in first year for outstanding exam results and Community Course Essay Prize in third year

University of Aberdeen: September 2012 – June 2013

First class BSc (Hons) in Neuroscience with Psychology (Intercalating)

interview Library-based dissertation: Promoting Plasticity after Traumatic Spinal Cord Injury

Grants

EPSRC Doctoral Prize Fellowship: August 2018

Awarded £17,372 to research tissue engineering approaches to maximise the potential of exosome therapies

Doctoral Academy Conference Support Fund (£500): July 2018

Wellcome Trust ISSF Public Engagement Grant: December 2017

Awarded £430 to develop interactive activities to explain stroke research

UMI³ Proof of Principle Programme Funding: March 2017

Awarded £5000 to explore mesenchymal stem cells as a therapy for stroke

Overseas Research Scholarship: June 2013

Awarded an 8 week summer research scholarship (£4000) to Professor James Fox's group in the Division of Comparative Medicine, Massachusetts Institute of Technology.

Awards

Doctoral Academy Graduate Society Conference Best Poster Presentation Prize: June 2018

University of Manchester Post-graduate Summer Research Showcase Short Film Award: July 2016

Made short film about my research journey and awarded best short film prize

BiotechnologyYES participant: October 2015

Worked in a team to prepare a hypothetical oral business plan and pitched to a panel of judges for investment in our regenerative medicine start-up company

Neuroscience Prize for Best Student: June 2013

Awarded after excellent academic achievement and successful prize interview

Employment

EPSRC Doctoral Prize Fellowship: November 2018 – October 2019

Research fellow

University of Manchester: September 2015 – October 2018

Graduate teaching assistant

Demonstrate on undergraduate medicine practicals including blood pressure and spirometry

Publications

Redondo-Castro, E., **Cunningham, C. J.**, Miller, J., Cain, S. A., Allan, S. M. and Pinteaux, E. (2018). Generation of Human Mesenchymal Stem Cell 3D Spheroids Using Low-binding Plates. *Bio-protocol* 8(16): e2968.

Cunningham, C. J., Redondo-Castro, E. and Allan, S. M. (2018) The Therapeutic Potential of the Mesenchymal Stem Cell Secretome in Ischaemic Stroke. *JCBFM*, 38(8), 1276-92.

Redondo-Castro, E., **Cunningham, C. J.**, Miller, J., Brown, H., Allan, S. M. and Pinteaux, E. (2018). Changes in the secretome of tri-dimensional spheroid-cultured human mesenchymal stem cells in vitro by interleukin-1 priming. *Stem Cell Research & Therapy*, 9(1), 11.

Redondo-Castro, E., **Cunningham, C.**, Miller, J., Martuscelli, L., Aoulad-Ali, S., Rothwell, N. J., Kieley, C. M., Allan, S. M. and Pinteaux, E. (2017). Interleukin-1 primes human mesenchymal stem cells towards an anti-inflammatory and pro-trophic phenotype in vitro. *Stem Cell Research & Therapy*, 8(1),

79.

Hainsworth, A. H., Allan, S. M., Boltze, J., **Cunningham, C.**, Farris, C., Head, E., Ihara, M., Isaacs, J. D., Kalaria, R. N., Lesnik Oberstein, S. A. M. J., Moss, M. B., Nitzsche, B., Rosenberg, G. A., Rutten, J. W., Salkovic-Petrisic, M. and Troen, A. M. (2017). Translational models for vascular cognitive impairment: a review including larger species. *BMC Medicine*, 15(1), 16.

Burns, M., Muthupalani, S., Ge, Z., Wang, T. C., Bakthavatchalu, V., **Cunningham, C.**, Ennis, K., Georgieff, M. and Fox, J. G. (2015). Helicobacter pylori Infection Induces Anemia, Depletes Serum Iron Storage, and Alters Local Iron-Related and Adult Brain Gene Expression in Male INS-GAS Mice. *PLoS One*, 10(11), e0142630.

Research Experience

EPSRC Doctoral Prize Fellowship: November 2018 –present

Conducting project on developing a tissue engineering strategy to maximise the therapeutic potential of exosomes for stroke in the lab of Dr Catherine Lawrence at the University of Manchester.

In vitro techniques: 3D cell culture, hydrogels, exosome isolation, live cell imaging, imaging flow cytometry, Western blotting

Courses: Statistics for In Vivo and In Vitro Biologists: An Introduction to R, Developing Research Leaders

PhD Project: April 2015 – September 2018

Conducting project on the effects of mesenchymal stem cell transplantation on neuroinflammation, post-stroke depression and sickness behaviour with Professor Stuart Allan.

Home Office personal license PIL A,B and C (mouse and rat)

In vivo techniques: surgery, burrowing behaviour, nest building, social interaction, open field, neurological scores, rotarod, elevated zero maze, novelty-suppressed feeding, novel object recognition, MRI, immunohistochemistry (paraffin and free-floating)

In vitro techniques: mesenchymal stem cell culture (2D and spheroids), co-cultures, ELISAs, immunohistochemistry, endothelial tube formation assay, scratch assay, live cell imaging

Overseas Research Scholarship to Massachusetts Institute of Technology: June – August 2013

Contributed to a project on iron deficiency in *H. pylori* infected INS-GAS mice and the effects on cognition. Presented to the department in MIT and at the Gastroenterology Research Symposium, University of Aberdeen.

Techniques: open field, elevated zero maze, DNA extraction from faecal samples, PCR, ELISAs

University of Aberdeen HOTSTART Programme: August – September 2012

Conducted a 6 week research project on the role of TWEAK in Parkinson's disease in the lab of Dr Peter Teismann finishing with a poster presentation evening.

Techniques: cryosectioning, Nissl staining, immunohistochemistry, stereological cell counting

University of Aberdeen HOTSTART Programme: July – August 2010

Completed an 8 week project on euglobulin clot lysis time with Professor Nuala Booth culminating in an oral and poster presentation.

Techniques: euglobulin clot lysis assay, ELISAs, SDS PAGE and Western blotting

Teaching Experience

Manchester Access Programme: 2016 – present

Tutor

Provided A-level students with guidance and feedback on biology assignments

Postgraduate Supervision: 2015 – present

Co-supervised an ERASMUS masters student for 6 months and an undergraduate project student. Additionally, I have trained a number of other students in tissue culture techniques and behavioural testing. From April 2019, I will be co-supervising a PhD student.

Science Administration

Peer Review: January 2019 - present

Peer reviewed for *Frontiers in Neurology*

Conference Chairing

Chaired session at the CDT Regenerative Medicine Conference 2016. Co-chaired session at the 10th International Symposium on Neuroprotection and Neurorepair.

Conference Organisation

On organising committee for UK Preclinical Stroke Symposium (24-25/06/19, University of

Manchester)

Public Engagement

Extensive experience of running table top activities at events including the University of Manchester Community Festival and Brain Box 2016 (Manchester Town Hall)

STEMNET Ambassador: April 2015 – present

Events include Café Scientifique on ethics of embryonic stem cells and Fun Palaces at Oldham Library

Blogging and Video Making: August 2017 – present

Run my own blog (www.sciencecat.co.uk) and produce short science communication videos for both my channel and the CDT Regenerative Medicine YouTube channel

Other Interests

23rd Manchester (Birch with Fallowfield) Scout Group: April 2016 – present

Cub scout leader

Responsibilities include running and planning games, activities and camps
Wood badge (training award) and nights away permit achieved June 2018

Conferences and Meetings

Cunningham, C. J., Wong, R., Redondo-Castro, Pinteaux, E. and Allan, S. M. (2018). [Oral Presentation]. Investigating the Role of the Mesenchymal Stem Cell Secretome in Promoting Repair after Ischaemic Stroke. 10th International Symposium on Neuroprotection and Neurorepair. Dresden, Germany.

Cunningham, C. J., Wong, R., Redondo-Castro, Pinteaux, E. and Allan, S. M. (2018). [Oral and Poster Presentation]. Investigating the Role of the Mesenchymal Stem Cell Secretome in Promoting Repair after Ischaemic Stroke. EPSRC and MRC Centres for Doctoral Training in Tissue Engineering and Regenerative Medicine Joint Conference, Keele, UK.

Cunningham, C. J., Wong, R., Redondo-Castro, E., Miller, J., Martuscelli, L., Pinteaux, E. and Allan, S. M. (2018). [Poster Presentation]. Can MSCs be Primed to Promote Recovery after Ischaemic Stroke? Postgraduate Summer Research Showcase. Manchester, UK.

Cunningham, C. J., Wong, R., Redondo-Castro, E., Miller, J., Martuscelli, L., Pinteaux, E. and Allan, S. M. (2018). [Poster Presentation]. Can MSCs be Primed to Promote Recovery after Ischaemic Stroke? Doctoral Academy Graduate Society Conference. Manchester, UK.

Cunningham, C. J., Wong, R., Redondo-Castro, E., Miller, J., Martuscelli, L., Pinteaux, E. and Allan, S. M. (2018). [Poster Presentation]. Can MSCs be Primed to Promote Recovery after Ischaemic Stroke? Manchester Regenerative Medicine Symposium. Manchester, UK.

Cunningham, C. J., Redondo-Castro, E., Wong, R., Martuscelli, L., Pinteaux, E. and Allan, S. M. (2017). [Poster Presentation]. Enhancing the Anti-inflammatory Properties of Mesenchymal Stem Cells as a Therapy for Stroke. Alzheimer's Research UK Early Career Researcher Conference, Manchester, UK.

Cunningham, C. J., Redondo-Castro, E., Wong, R., Martuscelli, L., Pinteaux, E. and Allan, S. M. (2017). [Oral Presentation]. Enhancing the Anti-inflammatory Properties of Mesenchymal Stem Cells as a Therapy for Stroke. UK Preclinical Stroke Symposium, Nottingham, UK.

Redondo-Castro, E., **Cunningham, C. J.**, Martuscelli, L., Pinteaux, E. and Allan, S. M. (2017). [Poster Presentation]. Enhancing the Anti-inflammatory Properties of Mesenchymal Stem Cells as a Therapy for Stroke. Doctoral Academy Graduate Society Conference. Manchester, UK.

Redondo-Castro, E., **Cunningham, C. J.**, Martuscelli, L., Pinteaux, E. and Allan, S. M. (2017). [Poster Presentation]. Enhancing the Anti-inflammatory Properties of Mesenchymal Stem Cells as a Therapy for Stroke. BRAIN, Berlin, Germany.

Redondo-Castro, E., **Cunningham, C. J.**, Martuscelli, L., Pinteaux, E. and Allan, S. M. (2016). [Poster Presentation]. Enhancing the Anti-inflammatory Properties of Mesenchymal Stem Cells. Mercia Stem Cell Alliance Young Investigators' Workshop and Annual Scientific Meeting, Manchester, UK.

Cunningham, C. J., Redondo-Castro, E., Miller, J., Martuscelli, L., Pinteaux, E. and Allan, S. M. (2016). [Poster Presentation]. Characterising 3D Spheroid Cultured Human Mesenchymal Stem Cells for Transplantation into a Mouse Model of Stroke. Postgraduate Summer Research Showcase, Manchester, UK.

Cunningham, C. J., Wong, R., Coutts, G., Pinteaux, E. and Allan, S. M. (2016). [Poster Presentation]. Characterising Post-stroke Depression and Sickness Behaviour in a Mouse Model of Stroke. EPSRC and MRC Centres for Doctoral Training in Tissue Engineering and Regenerative Medicine Joint Conference, Manchester, UK.