

## Michael John Deane Daniels

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### Personal Statement:

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I am a postdoctoral research fellow working for Dr Barry McColl in the UK Dementia Research Institute at the University of Edinburgh. My research focuses on the role played by microglial cells and the immune system in the progression and pathogenesis of dementia-causing diseases such as Alzheimer's. I completed my PhD at The University of Manchester where I was awarded the 2017 President's Distinguished Achievement Award - given to the best postgraduate student in the Faculty of Biology, Medicine and Health, a faculty currently containing over 1200 students. I am passionate about public engagement and science communication, co-founding a project aiming to increase public understanding of science called 'Have You Heard?' whilst also getting involved in the outreach event Pint of Science and winning the 2017 North-West regional final of the Famelab competition. Outside of my work I am a keen hiker/fell runner/mountaineer and (if I get the time) I like to get myself on a squash or badminton court!

### Education and Qualifications:

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*2014-2018 - Postgraduate*

PhD Cellular and molecular neuroscience – University of Manchester

Thesis title – *Regulation of interleukin-1*

Supervisors – Dr. David Brough, Dr. Herve Boutin, Dr. James Galea, Prof. Douglas Kell

*2012-2013 - Undergraduate*

Industrial placement – MedImmune

Project title – *Target validation for chronic pain*

Supervisors – Dr. Pete Thornton, Dr. Colin Glover

*2010-2014 - Undergraduate*

BSc Pharmacology (with Industrial Placement) – University of Leeds

Degree result – 1<sup>st</sup> class Hons (final avg 77%)

Research project title – Evaluating HDAC inhibitors as a potential treatment for stroke using *in vitro* models

## Publications:

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Moudio S, Willis A, Pytka K, Abulkassim R, Brett RR, Webster JF, Wozny C, Barbour M, Jiang H, Watson DG, van Kralingen JC, MacKenzie SM, **Daniels MJD**, McColl BW, Sossick S, Nuthall HN, Bushell TJ. *Protease-activated receptor 2 activation induces behavioural changes associated with depression-like behaviour through microglial-independent modulation of inflammatory cytokines.* **Psychopharmacology.** 2022

Rifai OM, Longden J, O'Shaughnessy J, Sewell MDE, McDade K, **Daniels MJD**, Abrahams S, Chandran S, McColl B, Sibley CR, Gregory JM. *Random forest modelling of neuropathological features identifies microglial activation as an accurate pathological classifier of C9orf72-related amyotrophic lateral sclerosis.* **BioRxiv.** 2021

McCulloch L, Harris AJ, Malbon A, **Daniels MJD**, Younas M, Grainger JR, Allan SM, Smith CJ, McColl BW. *Treatment with IgM-enriched intravenous immunoglobulins (IgM-IVIg) enhances clearance of stroke-associated bacterial lung infection.* **BioRxiv.** 2021

Rivers-Auty J, Tapia VS, White CS, **Daniels MJD**, Drinkall S, Kennedy PT, Spence HG, Yu S, Green JP, Hoyle C, Cook J, Bradley A, Mather AE, Peters R, Tzeng T, Gordon MJ, Beattie JH, Brough D and Lawrence CB. *Zinc Status Alters Alzheimer's Disease Progression through NLRP3-Dependent Inflammation.* **Journal of Neuroscience.** 2021

Tzioras M, **Daniels MJD**, King D, Popovic K, Holloway RK, Stevenson AJ, Tulloch J, Kandasamy J, Sokol D, Latta C, Rose J, Smith C, Miron VE, Henstridge C, McColl BW, Spires-Jones TL. *Altered synaptic ingestion by human microglia in Alzheimer's disease.* **BioRxiv.** 2019

Tapia VS, **Daniels MJD**, Palazón-Riquelme P, Dewhurst M, Luheshi NM, Rivers-Auty J, Green J, Redondo-Castro E, Kaldis P, Lopez-Castejon G, Brough D. *The three cytokines IL-1 $\beta$ , IL-18, and IL-1 $\alpha$  share related but distinct secretory routes.* **J Biol Chem.** 2019

Rivers-Auty J, **Daniels MJD**, Colliver I, Robertson D, Brough D. *Redefining the ancestral origins of the interleukin-1 superfamily.* **Nature Communications.** 2018.

**Daniels MJD**, Adamson AD, Humphreys N, Brough D. *CRISPR/Cas9 mediated mutation of mouse IL-1 $\alpha$  nuclear localisation sequence abolishes expression.* **Scientific Reports.** 2017.

Baldwin AG, Rivers-Auty J, **Daniels MJD**, White CS, Schwalbe CH, Schilling T, Hammadi H, Jaiyong P, Spencer N, England H, Luheshi N, Kadirvel M, Lawrence CB, Rothwell NJ, Harte MK, Bryce RA, Allan SM, Eder C, Freeman S, Brough D. *New boron based inhibitors of the NLRP3 inflammasome.* **Cell Chemical Biology.** 2017.

**Daniels MJD**, Brough D. *Unconventional Pathways of Secretion Contribute to Inflammation.* **Int J Mol Sci.** 2017. 5;18

Huang SW, Walker C, Pennock J, Else K, Muller W, **Daniels MJD**, Pellegrini C, Brough D, Lopez-Castejon G, Cruickshank SM. *P2X7 receptor-dependent tuning of gut epithelial responses to infection.* **Immunol. Cell Biol.** 2017. 95:178-88

**Daniels MJD\***, Rivers-Auty J\*, Schilling T, Spencer NG, Watremez W, Fasolino V, Booth S, White CS, Baldwin AG, Freeman S, Wong R, Latta C, Yu S, Jackson J, Fischer N, Koziel V, Pillot T, Bagnall J, Allan SM, Paszek P, Galea J, Harte MK, Eder C, Lawrence CB, Brough D. *Fenamate NSAIDs inhibit the NLRP3 inflammasome and protect against Alzheimer's disease in rodent models*. **Nature Communications**. 2016. 7:12504

Martín-Sánchez F, Diamond C, Zeitler M, Gomez-Sanchez A, Baroja-Mazo A, Bagnall J, Spiller D, White M, Mortellaro A, Peñalver M, **Daniels MJD**, Paszek P, Steringer JP, Nickel W, Brough D, Pelegrín P. *Inflammasome-dependent IL-16 release depends upon membrane permeabilisation*. **Cell Death and Differentiation**. 2016. 23:1219-31

\*Equal contribution

## Grants:

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- 2021 – Scottish Neurological Research Fund Seedcorn – co-applicant (£14 865)
- 2021 – UK DRI Collaborative Single Cell And Spatial Transcriptomics Studies Award - co-applicant (£9 900)
- 2021 – ARUK Scotland Network Centre Grant (£2 000)
- **2021 – UK DRI Pilot Project Grant (£47 179)**
- 2019 – RS MacDonald Seedcorn Grant (£5 000)
- 2019 – British Society for Immunology Communicating Immunology Grant (£600)
- 2019 – ARUK Scotland Network Centre Grant (£1 923)
- 2019 – UoM 2019 Engaging our Communities grant – co-applicant (£600)
- 2018 – University of Manchester Doctoral Academy Conference Support Fund (£360)
- 2018 – British Society for Immunology Travel Award (£700)
- 2017 – Wellcome Trust ISSF Public Engagement grant – co-applicant (£500)
- 2017 – UoM Engaging our Communities grant – co-applicant (£500)
- 2017 – MRC Flexible Training Supplement to attend international training course (£1 150)
- 2015 - Neurobiology Research Theme Travel Grant (£300)

## Awards:

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- 2021 - Shortlisted for CMVM Student Supervision and Support Award
- **2019 - SULSA ECR Prize in Understanding & Treating Disease (£3000)**
- 2019 – University of Manchester ‘Making a Difference Award’ for the Have You Heard? Project
- **2018 – Selected as one of 600 top young scientists in the world to attend the Lindau Nobel Laureate meetings (£5000)**
- 2017 – **President’s Distinguished Achievement Award – Postgraduate Student of the Year**
- 2017 - Outstanding Research Output (Manchester Doctoral Academy)
- 2017- FBMH Outstanding Contribution to Patient and Public Involvement and Engagement 2017 (Highly Commended)

- 2017 - University of Manchester 3-Minute Thesis (Runner up)
- 2017 – Audience vote winner of NW region 'Famelab' competition
- 2017 - Famelab North-West Region (Winner)
- 2016 - University of Manchester 3-Minute Thesis (Finalist)
- 2015 - F1000-sponsored 'Flash Talk' competition (Winner)
- 2014 - Student Contribution to Pharmacology Prize (University of Leeds)
- 2010 - Faculty of Biological Sciences Achievement Scholarship (£1000)

## Skills/Techniques:

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|---|--|
| • Cell culture  | • Immunoblotting   |
| • Primary cell isolations                                       | • Chronic <i>in vivo</i> models of neurodegenerative disease |
| • Mouse and Rat <i>in vivo</i> techniques (Personal HO Licence) |  |
| • Live cell imaging   | • siRNA knockdown  |
| • Immunocytochemistry/Immunohistochemistry                      | • Chemotaxis assays  |
| • Flow cytometry  | • Mouse colony management                                    |
| • qPCR  |  |

## Conferences/Workshops:

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- *BSI Congress 2021*, Edinburgh (UK), December 2021. Poster. "Investigating microglial lysosome function and the role of cystatin F in neurodegenerative disease"
- *UK DRI @ Edinburgh Annual Symposium*, Edinburgh (UK), April 2019. **Oral**. "Investigating microglial lysosome function and the role of cystatin F in neurodegenerative disease"
- *Inflammation: from initiation to restoration*, Edinburgh (UK), April 2019. Poster. "Investigating microglial lysosome function and the role of cystatin F in neurodegenerative disease"
- *ARUK 2019*, Harrogate (UK), March 2019. Poster. "Investigating microglial lysosome function and the role of cystatin F in neurodegenerative disease"
- *Toll 2018*, Porto (Portugal), June 2018. Poster. "Discovering novel regulators of IL-1 $\alpha$  processing".
- *Single Cell RNA Sequencing*, EMBL (Heidelberg, Germany), May 2018. Workshop.
- *5<sup>th</sup> Venusberg meeting on Neuroinflammation*, Bonn (Germany), May 2017. Poster. "Understanding the processing of the proinflammatory cytokine interleukin-1 alpha".
- *Unconventional Proteins and Membrane Trafficking (UPMT)*, Lecce (Italy), October 2016. Oral presentation. "The nuclear localisation sequence of IL-1 $\alpha$  is critical for function: An evolutionary perspective".
- *Alzheimer's Research UK (ARUK)*, Manchester (UK), March 2016. Poster and oral presentation (PhD day). "Fenamate non-steroidal anti-inflammatory drugs (NSAIDs) are inhibitors of the NLRP3 inflammasome and could be repurposed to treat Alzheimer's Disease"
- *Innate Immune Memory*, Cambridge (UK), March 2015. Poster. "Non-steroidal anti-inflammatory drugs (NSAIDs) as inhibitors of the NLRP3 inflammasome".

## Relevant other employment and responsibilities:

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- **2017-present** –Paid roles to teach fellow PhD students in public engagement and science communication. I have also been invited to run paid international workshops.
- 2019-present – Alzheimer’s Research UK Scotland Network Early Career Researcher Representative
- 2019-present – UK DRI Early Career Researcher Representative
- **2019-present** – Peer-review for journal articles submitted to:
  - o **Brain, Behaviour and Immunity (1)**
  - o **European Journal of Neuroscience (2)**
  - o **Brain Communications (2)**
  - o **Cell Reports (1)**
- **2021-present** - Peer-review for grant submissions to Alzheimer’s Research UK
- 2015-2018 - **MRC DTP Student Rep.** Contributed to application and sat on interview panel successful in obtaining 9 fully funded studentships from the MRC. I founded and chaired a committee of students and oversee numerous highly successful cohort-led events including workshops, seminar series, keynotes and socials.
- **2014-present** – Taking a primary role in mentoring and supervising MSc (x5), BSc (x5), and PhD (1x formal co-supervisor) students many of whom have had their work published.
- 2014-2017 - Demonstrated for undergraduate students on a broad range of biomedical techniques.
- 2014-2015 – Coordinated departmental seminar series.

## Invited talks & public engagement:

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- 2021 – Invited speaker for ISTAART (Imunity & PEERS PIAs) Methods Club Webinar
- 2021 – Invited speaker at UK DRI Neuroinflammation ECR Day – Methodology of Glial cell isolation and culture
- 2019 – Invited speaker at School of Psychology and Neuroscience, University of St. Andrews
- 2019 – Invited speaker for Glasgow Skeptics Society
- 2019 – Edinburgh Dementia Buddy Scheme
- **2019 – Invited to deliver a full-day workshop on scientific presentations at IMM Lisbon, Portugal**
- 2019 – Invited speaker at Edinburgh UK DRI annual meeting
- 2018 – Invited speaker at Institute of Molecular Bioscience, University of Queensland, Australia
- 2018 – Invited speaker at Walter and Eliza Hall Institute, Australia
- 2018 – Invited to give a workshop on Science Communication at YSJ conference
- **2017 - present** – Ongoing activity as co-founder of the Have You Heard? project

- 2017 – Invited speaker for the UoM Clinical Neurology Society
- 2017 – Skype lab practical session to Mosborough Primary School
- 2016 – The Brain Box
- 2016 & 2017 – Outreach talks at Dean Oaks Primary School & Wilmslow Grange Primary School
- 2015 & 2016 – Pint of Science, Manchester. Sub-team Leader.
- 2015 & 2017 – Body Experience, Manchester

## Science communication & media:

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- 2017 – Co-founded and currently run a project aimed at improving public perception of science, Have You Heard? <https://haveyouhearduk.com/>
- 2017 – Press release on our latest paper - <https://goo.gl/G7iWkW>
- 2017 – Youtube video series – The science behind zombies - <https://goo.gl/1CQYdz>
- 2017 – Feature on my PhD at Manchester - <https://goo.gl/GBJ5X1>
- 2017 – Blog on our latest paper - <https://goo.gl/w11c4a>
- 2017 - Famelab UK final - <https://goo.gl/uZzjus>
- 2016 - Reddit AMA - <https://goo.gl/rnGv5w>
- 2016 - Faculty 'Minute lecture' – 'Old drugs for new treatments' - <https://goo.gl/fX1vGa>
- 2016 - Manchester TV interview - <https://goo.gl/vwAh37>
- 2016 - Daniels *et. al.* press release - <https://goo.gl/tgzGuR>
- 2016 - KCBS Radio San Francisco Live Interview
- 2016 - Faculty advent feature - 'Christmas Dinners' - <https://goo.gl/ZT00OH>
- 2015 - Faculty blog – Tuesday feature - <https://goo.gl/QwR5Wf>

## Referees:

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- Dr. David Brough, Supervisor, Faculty of Biology Medicine and Health, University of Manchester, Manchester, M13 9PL Email: [david.brough@manchester.ac.uk](mailto:david.brough@manchester.ac.uk)
- Prof. Stuart Allan, Head of Domain, Faculty of Biology Medicine and Health, University of Manchester, Manchester, M13 9PL Email: [stuart.allan@manchester.ac.uk](mailto:stuart.allan@manchester.ac.uk)
- Dr. Barry McColl, Supervisor, University of Edinburgh, UK Dementia Research Institute, University of Edinburgh, 49 Little France Crescent, EH16 4SB, UK E-mail: [barry.mccoll@ed.ac.uk](mailto:barry.mccoll@ed.ac.uk)  
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