

# ISABELLE FOOTE

Institute for Behavioral Genetics  
University of Colorado Boulder  
1480 30<sup>th</sup> St  
Boulder  
CO 80303, USA

Phone: +44 (0)7748 750983  
Email: [isabelle.foote@colorado.edu](mailto:isabelle.foote@colorado.edu)  
Twitter: @IsabelleFFoote

## RESEARCH SUMMARY

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I am a UK registered adult nurse with research experience in neuroscience, psychiatry, epidemiology and statistical genetics. My multidisciplinary training with a clinical foundation means that I always endeavour to conduct research that has a genuine translational benefit. My research uses statistical genetic methods to better understand the biological underpinnings of early prodromal symptoms and modifiable risk factors of dementia to identify ways to prevent or delay its onset. I am also passionate about reducing inequalities in healthcare by conducting more inclusive genetics research across diverse populations.

## EDUCATION

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- PhD in Epidemiology**, Queen Mary University of London (UK) **Apr 2022**  
Thesis: "The shared genetic architecture of modifiable risk for dementia and its influence on brain health"  
Supervisors: Professor Ania Korszun, Dr Charles Marshall and Professor Kamaldeep Bhui
- MSc in Neuroscience**, King's College London (UK) **Sep 2018**  
Thesis: "Preventing inflammation-induced reduction of neurogenesis"  
Supervisors: Dr Patricia Zunszain and Dr Alessandra Borsini  
Passed with Merit (69)
- Bachelor of Nursing**, University of Birmingham (UK) **Aug 2017**  
Dissertation: "An integrative review of how adverse effects of anti-epileptic drugs affect adherence in adults with epilepsy"  
Supervisors: Professor Fiona Irvine and Dr Amelia Swift  
Graduated with 1<sup>st</sup> class honours

## RESEARCH EXPERIENCE

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- Postdoctoral Associate**, University of Colorado Boulder, Institute for Behavioral Genetics **Current**  
*Advisor:* Dr Andrew Grotzinger  
*Main project:* Large-scale genomic analysis of aging-related cognitive change prior to dementia onset.  
*Methods:* I am working on an NIA funded grant to develop a new GWAS methodology that can identify genetic markers associated with a longitudinal phenotype. I am also involved in or leading additional projects that apply multivariate genomic methods to dementia prevention and healthy aging research.

**PhD student**, Queen Mary University of London, Wolfson Institute of Population Health **2018-2022**

*Project aim:* To measure the genetic architecture of modifiable risk for dementia and its impact on brain health.

*Methods:* I conducted a multivariate GWAS of the shared genetics between dementia modifiable risk factors using genomic SEM to uncover how these traits influence dementia risk and brain health on a genetic level.

**MSc student**, King's College London, Stress Psychiatry & Immunology Lab **2018**

*Project aim:* To investigate whether *in vitro* treatment of human hippocampal progenitor cells with omega-3 fatty acids can prevent inflammation-induced changes in neurogenesis in a cellular model of depression.

*Methods:* Cell culture, immunocytochemistry, quantitative cell imaging analysis, general laboratory skills.

## TEACHING EXPERIENCE

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**BSc Project Supervisor**, Barts & The London School of Medicine & Dentistry, QMUL **Jan-June 2021**

- I designed and wrote a competitive proposal for a BSc dissertation project looking at the shared genetics between psychosis and dementia using genomic SEM.
- I supported my student in how to perform the relevant coding and data analysis steps to complete her project, for which she was awarded 89%. We are now working on a manuscript to submit for publication.

**PBL Facilitator**, Barts & The London School of Medicine & Dentistry, QMUL **Mar 2020-2021**

- Facilitator for problem-based learning (PBL) sessions for the Year 1 and 2 Medicine students.
- Marking of critical appraisal assignments at the end of each session block.

## CLINICAL EXPERIENCE

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**Volunteer Nurse**, Himalayan Health Exchange, Himachal Pradesh (India) **Summer 2017**

I was a member of a multidisciplinary team of doctors, nurses and dentists that travelled to India as part of an established charity programme that provides remote healthcare to villages in the Himalayas who would otherwise have no access to healthcare. Duties included:

- Assisting with triage and setting up temporary clinics
- Teaching medical students' assessment and clinical skills
- Working with local Tibetan nurses to provide school nursing care, health education and worming treatment to a school of >1000 Tibetan refugee children

**Nursing Student**, University of Birmingham, Birmingham (UK) **2011-2017**

I had clinical placements in hospital, research and community settings in the following specialities:

- **General:** Neurosurgery; Neurosciences Critical Care Unit; Acute Older Adult; Emergency Department; Ambulatory Care; Cardiothoracic Surgery; Urology; Complex Discharge Unit (all Queen Elizabeth Hospital Birmingham); District nursing (Yardley Wood team).
- **Psychiatric:** North Birmingham Home Treatment Team and inpatient acute male ward (Oleaster Hospital, Birmingham).
- **Research:** Trauma Research Team (Queen Elizabeth Hospital Birmingham).

**Bank Healthcare Assistant**, Addenbrooke's Hospital, Cambridge (UK) **2013-2014**

- Provision of basic nursing care and 1:1 care for 'at risk' patients with dementia, delirium or trauma.

### Prevention Working Group Co-Lead, DEMON Network 2021-present

- I was appointed to this competitive post as co-lead of the Prevention Working Group for the Deep Dementia Phenotyping (DEMON) Network in August 2021.
- The DEMON Network is an international network of >1000 members that aims to improve the application of data science and AI approaches in dementia research (<https://demondementia.com>).
- My duties: co-host the monthly working group meetings, organise seminars and training workshops for members, co-author/lead sections of collaborative publications/grant applications, work with the leadership team to promote and enhance the DEMON Network in line with its key aims.

### WISE@QMUL Committee Member, Queen Mary University of London 2019-2021

- Assisted with planning and writing successful applications for funding to cover academic and public engagement events (GradFest, Festival of Communities).
- Worked on the Technical and Evaluation sub-committees to organise a 2-day virtual conference (took place in March 2021) focusing on current issues facing women in STEMM disciplines.

### PhD Student Representative (Wolfson Institute), Queen Mary University of London 2019-2022

- Leading and co-ordinating staff-student liaison meetings.
- Creating virtual peer support groups for PhD students during the COVID-19 pandemic.
- Organising training events for PhD students including an in-person multivariate methods training symposium with internal and external speakers for which I secured funding from LISS-DTP. There were over 100 registered attendees to this event from multiple London universities.

## PUBLICATIONS

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### JOURNAL ARTICLES

1. Foote IF, Jacobs BM, Mathlin G, Watson CJ, Bothongo PLK, Waters S et al. (2022) *The shared genetic architecture of modifiable risk for Alzheimer's disease: a genomic structural equation modelling study.* *Neurobiology of Aging* 117:222-235, <https://doi.org/10.1016/j.neurobiolaging.2022.02.016>.
2. Liu H, Dehestani M, Blauwendraat C, Makarious M, Leonard H, Kim J, Schulte C, Noyce A, Jacobs B, Foote IF et al. (2022) *Polygenic resilience modulates penetrance of Parkinson's disease genetic risk.* *Annals of Neurology* 92(2):270-278, <https://doi.org/10.1002/ana.26416>.
3. Bothongo PLK, Jitlal M, Parry E, Waters S, Foote IF, Watson CJ et al. (2022) *Dementia risk in a diverse population: A single-region nested case-control study in the East End of London.* *Lancet Regional Health (Europe)* 15:100321, <https://doi.org/10.1016/j.lanepe.2022.100321>.
4. Leonard HL, Murtadha R, Martinez-Carrasco A, Muller-Nedebock A, [...] Foote IF et al. (2022) *The IPDGC/GP2 Hackathon – an open science event for training in data science, genomics and collaboration using Parkinson's disease data.* *Biorxiv [Preprint]*, <https://doi.org/10.1101/2022.05.04.490670>.
5. Elsayed I and Foote IF (2021) *Improving diversity in Parkinson's disease genetics: findings from the first-ever GWAS in Latinos.* *Movement Disorders* 36(11):2505-2505, <https://doi.org/10.1002/mds.28782>.

## CONFERENCE PROCEEDINGS

1. Paris A, Amirthalingam G, Karania T, Dey S, **Foote I**, Bothongo P et al. (2022) *Depression is associated with increased dementia risk and reduced grey matter in a fronto-insular-cerebellar network*. *Journal of Neurology, Neurosurgery & Psychiatry* 93(9):e2, <http://dx.doi.org/10.1136/jnnp-2022-abn2.87>.
2. Watson C, Waters S, Jacobs B, **Foote I**, Dey S, Noyce A and Marshall C (2022) *Neuroanatomical signatures of genetic risk for Alzheimer's disease in healthy adults*. *Journal of Neurology, Neurosurgery & Psychiatry* 93(6):A101-A102, <http://dx.doi.org/10.1136/jnnp-2022-ABN.328>.
3. Waters S, Watson C, Jacobs BM, **Foote IF**, Dey S, Noyce AJ and Marshall CR (2021) *Speech-in-noise perception is a marker of preclinical Alzheimer's disease*. *Alzheimer's & Dementia* 17, e054639, <https://doi.org/10.1002/alz.054639>.
4. **Foote IF**, Jacobs B, Watson C, Bothongo P, Waters S, Dobson R, Noyce A, Bhui K, Korszun A and Marshall C (2021) *W26. A multivariate genome-wide association study of modifiable risk for Alzheimer's disease: 269 loci associated with brain health*. *European Neuropsychopharmacology* 51, e159, <https://doi.org/10.1016/j.euroneuro.2021.08.115>.
5. **Foote IF**, Jacobs BM, Noyce AJ, Korszun A, Bhui KS and Marshall CR (2020) *Exploring the shared genetic architecture of modifiable risk factors and related endophenotypes of Alzheimer's disease: A genomic SEM study*. *Alzheimer's & Dementia* 16, e045164, <https://doi.org/10.1002/alz.045164>.
6. Bothongo PLK, Jitlal M, Parry E, **Foote IF**, Waters S, Dobson R, Noyce AJ, Bestwick JP and Marshall CR (2020) *Ethnic and socioeconomic determinants of dementia risk: a nested case-control study in the population of East London*. *Alzheimer's & Dementia* 16, e037869, <https://doi.org/10.1002/alz.037869>.

## BOOK CHAPTERS

1. Ranson JM, Bucholc M, Lyall D, Newby D, Winchester L, Oxtoby N, Veldsman M, Rittman T, Marzi S, Skene N, Al Khleifat A, **Foote I**, Orgeta V, Kormilitzin A and Llewellyn DJ (in press) *The Emerging Role of AI in Dementia Research and Healthcare*. Artificial Intelligence in Medicine. Springer-Nature Publishing.

## CONFERENCE PRESENTATIONS

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1. Foote, I.F. et al. *The shared genetic architecture of modifiable risk for Alzheimer's disease and its influence on brain health*. Oral presentation at the AD/PD conference, March 2022 (Barcelona, Spain).
2. Foote, I.F. et al. *A multivariate genome-wide association study of modifiable risk for Alzheimer's disease: 269 loci associated with brain health*. Poster presentation at the World Congress of Psychiatric Genetics, October 2021.
3. Foote, I.F. et al. *A multivariate genome-wide association study of modifiable risk for Alzheimer's disease identifies shared genetic pathways linked to brain health*. Oral presentation at the Health Research in East London Annual Conference, October 2021.
4. Foote, I.F. et al. *The genetic architecture of modifiable risk for Alzheimer's disease*. Oral presentation at the William Harvey Day (QMUL), October 2021.
5. Foote, I.F. et al. *The genetic architecture of Alzheimer's disease risk and the challenge of oligogenicity*. Poster presentation at the Genomics of Brain Disorders conference (Wellcome Genome Campus, UK), March 2021.
6. Foote, I.F. et al. *More than a bivariate relationship: Exploring the shared genetic architecture of depression, Alzheimer's disease and related risk factors using genomic structural equation modelling*. Poster presentation at the World Congress of Psychiatric Genetics, October 2020.
7. Foote, I.F. et al. *Exploring the shared genetic architecture of modifiable risk factors and related endophenotypes of Alzheimer's disease: a genomic SEM study*. Poster presentation at the Alzheimer's Association International Conference, July 2020.

## EXTERNAL INVITED EVENTS

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**Oral Presentation**, “The shared genetic architecture of modifiable risk for dementia and its influence on brain health,” DEMON Network Genetics Working Group Meeting, Apr 2022

**Oral Presentation**, “A multivariate genome-wide association study of modifiable risk for dementia,” International Parkinson’s Disease Genetics Consortium (IPDGC) Trainee Network, Nov 2021

**Oral Presentation**, “Using genomic structural equation modelling to model the genetic architecture of Alzheimer’s disease risk,” DEMON Network Prevention Working Group, Mar 2021.

**Oral Presentation**, “Using genomic SEM to model the shared genetic architecture between Alzheimer’s disease and modifiable risk factors,” IPDGC Trainee Network, Jan 2021.

**Oral Presentation**, “Using genomic SEM to model the shared genetic architecture between neurodegenerative diseases and associated risk factors,” IPDGC Mendelian Randomization Working Group, Nov 2020.

**Podcast Panellist**, “Neuropsychiatric Symptoms in Dementia,” NIHR Dementia Researcher, Mar 2020.

**Podcast Panellist**, “Prediction & Prevention in Neurodegenerative Diseases,” NIHR Dementia Researcher, Dec 2019.

## HONOURS AND AWARDS

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**Poster Competition Finalist 2021** – I was nominated as a finalist for the poster competition at the 2021 World Congress of Psychiatric Genetics based on my multivariate GWAS work.

**ECIP Travel Award Winner 2020** - I won a travel award from the International Society of Psychiatric Genetics to attend the World Congress of Psychiatric Genetics conference based on my PhD work using genomic SEM.

## PROFESSIONAL AFFILIATIONS

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Nursing and Midwifery Council (UK) | **2017-present** | *Registered adult nurse (Pin number: 16F0549E)*

NIHR Dementia Researcher Early Career Researcher Network | **2019-present** | *Member & Guest Podcast Panellist*

Alzheimer’s Association | **2020-present** | *Member of the Diversity & Disparities; Neuropsychiatric Syndromes and the Reserve, Resilience & Protective Factors ISTAART Professional Interest Groups*

DEMON Network | **2020-present** | *Member of the Prevention (also co-lead) & Genetics/Omics Working Groups*

International Parkinson’s Disease Genetics Consortium | **2020-present** | *Member of the Trainee Network*

The Global Parkinson’s Disease Genetics Program | **2020-present** | *Member of the Trainee Network*