Laura C. Murphy, Ph.D.

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Edinburgh, UK

- An adaptable, creative bioimage analyst with a background in neurobiology and genetics
- Proficiency in various image analysis software including QuPath, ImageJ, CellProfiler.
- Regularly write bespoke image analysis macros using ImageJ and Groovy with some experience in Python and MATLAB
- Passionate about data analysis, presentation and interpretation in biomedical research.

Current Position

BioImage Analyst — Institute of Genetics and Cancer
January 2017 – present — University of Edinburgh, UK

I oversee analysis of microscopy data for of the institute, covering a range of research areas. I achieve this through developing and implementing algorithms in collaboration with users to achieve their research outcomes. I also create materials and teach regular workshops aimed at increasing understanding of image analysis concepts as well as workflows in specific software packages.

Other Experience

Visiting Scientist — Imaging Platform
January 2018 – February 2018 — Broad Institute, Cambridge, Massachusetts

I was awarded a grant (NEUBIAS STSM) to spend six weeks in the lab that develops the image analysis software, CellProfiler. While there, I created and adapted image analysis pipelines for their collaborators, contributed to online resources and shadowed the development team.

Ph.D. student Institute of Genetics and Cancer
Sept 2012 – March 2017 University of Edinburgh

I studied trafficking of axonal mitochondria in cultured neurons from a novel mouse model by utilising fluorescence microscopy as well as a range of molecular biology techniques.

Research assistant Autism Research Centre
Aug 2011 – Sept 2012 University of Cambridge

I performed bioinformatics analyses for genetic studies and had responsibility over the database of individuals who had donated DNA. This included recruitment of and being point of contact for the donating individuals as well as responsibility over their data and related ethics applications.

Education

2012 – 2017 **Ph.D. in Molecular Medicine** University of Edinburgh
"*Mitochondrial trafficking in a mouse model of psychiatric illness*."

2010 – 2011 **M.Sc. in Human Molecular Genetics** Imperial College London
Result: Distinction

2006 – 2010 **B.Sc. (Hons) in Genetics** University of Glasgow
Result: Upper second class honours

Skills

Laboratory skills
Microscopy image analysis using both open-source and commercial software packages (ImageJ/FIJI, QuPath, CellProfiler, Ilastik, Imaris, Definiens, Napari). Light microscopy, mouse work, neurobiology, cell biology.

Computational
Proficiency in R, Groovy, Python. Version control with Git. Cluster computing.

Teaching
In my current position facility I regularly train individuals how to use image analysis software in workshop settings as well as one-on-one situations. I also have informally mentored students in my current post as well as while working towards my PhD.

Memberships

- Committee member of RMS Data Analysis in Imaging Section
- Review Editor on Editorial Board of Computational BioImaging section, Fronteirs in Bioinformatics

Publications

Primary research papers

- Quidwai T, Wang J, Hall EA, Petriman NA, Leng W, Kiesel P, Wells JN, **Murphy LC**, Keighren MA, Marsh JA, Lorentzen E, Pigino G and Mill P (2021) *A WDR35-dependent coat protein complex transports ciliary membrane cargo vesicles to cilia.* eLife 2021; 10:e69786
- Bengani H, Grozeva D, Moyon L , Bhatia S , Louros SR, Hope J, Jackson A, Prendergast JG, Owen LJ, Naville M, Rainger J, Grimes G, Halachev M , **Murphy LC**, Spasic-Boskovic O, van Heyningen V, Kind P, Abbott CM, Osterweil E, Raymond FL , Crollius HR and FitzPatrick D (2021) *Identification and functional modelling of plausibly causative cis-regulatory variants in a highly-selected cohort with X-linked intellectual disability.* PLoS ONE 16(8):e0256181
- Gudiño V, Pohl S O-G, Billard CV, Cammareri P, Bolado A, Aitken S, Stevenson D, Hall AE, Agostino M, Cassidy J, Nixon C, von Kriegsheim A, Freile P, Popplewell L, Dickson G, **Murphy L**, Wheeler A, Dunlop M, Din F, Strathdee D, Sansom OJ and Myant KB (2021) *RAC1B modulates intestinal tumourigenesis via modulation of WNT and EGFR signalling pathways.* Nat Comm; 12, 2335.
- Longman D, Jackson-Jones KA, Maslon MM, **Murphy LC**, Young RS, Stoddart JJ, Hug N, Taylor MS, Papadopoulos DK, and Caceres JF (2020). *Identification of a localized nonsense-mediated decay pathway at the endoplasmic reticulum*. Genes Dev 34, 1075–1088.
- Tennant PA, Foster RG, Dodd DO, Sou IF, McPhie F, Younger N, **Murphy LC**, Pearson M, Vernay B, Keighren MA, Budd P, Hart SL, Megaw R, Boulter L and Mill P (2021) *Fluorescent in vivo editing reporter (FIVER): A novel multispectral reporter of in vivo genome editing*. bioRxiv 2020.07.14.200170
- Malavasi ELV, Economides KD, Grünewald E, Makedonopoulou P, Gautier P, Mackie S, **Murphy LC**, Murdoch H, Crummie D, Ogawa F, McCartney DL, O'Sullivan ST, Burr K, Torrance HS, Phillips J, Bonneau M, Anderson SM, Perry P, Pearson M, Constantinides C, Davidson-Smith H, Kabiri M, Duff B, Johnstone M, Polites HG, Lawrie SM, Blackwood DH, Semple CA, Evans KL, Didier M, Chandran S, McIntosh AM, Price DJ, Houslay MD, Porteous DJ and Millar JK (2018) *DISC1 regulates N-methyl-D-aspartate receptor dynamics: abnormalities induced by a*

Disc1 mutation modelling a translocation linked to major mental illness. Transl Psychiatry 8, 184

- Ogawa F, **Murphy LC**, Malavasi ELV, O'Sullivan ST, Torrance HS, Porteous DJ, Millar JK. (2016) *NDE1 and GSK3β associate with TRAK1 and regulate axonal mitochondrial motility: Identification of cyclic AMP as a novel modulator of axonal mitochondrial trafficking*. ACS Chemical Neuroscience 7(5).
- Warrier V, Chakrabarti B, **Murphy L**, Chan A, Craig I, Mallya U, et al. (2015) A Pooled GenomeWide Association Study of Asperger Syndrome. PLoS ONE 10(7): e0131202.
- Baron-Cohen S, **Murphy L,** Chakrabarti B, et al. (2014) *A Genome Wide Association Study of Mathematical Ability Reveals an Association at Chromosome 3q29, a Locus Associated with Autism and Learning Difficulties: A Preliminary Study*. PLoS ONE 9(5).
- Tavassoli T, Auyeung B, **Murphy LC,** Baron-Cohen S, Chakrabarti B. (2012) *Variation in the autism candidate gene GABRB3 modulates tactile sensitivity in typically developing children*. Molecular Autism 3(6).

Reviews

- **Murphy, LC**, Millar, JK. (2017) Regulation of mitochondrial dynamics by DISC1, a putative risk factor for major mental illness. Schizophrenia Research 187(55-61)

Conference, Course and Workshops

- EMBL Deep Learning for Image Analysis 2022: Trainer
- EMBO Advanced Methods in Bioimage Analysis 2021: Trainer
- EMBL Deep Learning for Image Analysis 2021: Trainee
- RMS-IAFIC Train Your Trainer Event: Trainee
- NEUBIAS Training School 8 2018: Scientific Organiser
- NEUBIAS (Network of European Bioimage Analysts) Training School 5 2017: Trainee
    - Travel grant awarded by Society for Experimental Biology
- Edinburgh Neuroscience Day 2016: Presenter
    - Oral presentation: "*Mitochondrial trafficking in psychiatric illness*
- Society for Neuroscience 2015: Presenter
    - Poster presentation: "*Defective axonal mitochondrial trafficking in a DISC1 translocation mouse model*"
    - Travel grant awarded by Disease Models and Mechanisms