Jamie Whitelaw
Lecturer
School of Health and Life Sciences

Overview

In 2017, I earned my PhD in Infection and Immunity from the University of Glasgow, where I worked under the mentorship of Prof. Markus Meissner. My doctoral research focused on unravelling the complexities of parasitic invasion mechanisms of *Toxoplasma gondii*. Following this, I spent six years as a postdoctoral researcher at the CRUK Beatson Institute, collaborating with Prof. Laura Machesky to investigate the intricacies of cancer cell migration.
Throughout my research career, I've leveraged cutting-edge gene-editing techniques to generate genetic knockout models in both mammalian cells and parasites. One of my key contributions was deciphering the invasion machinery of *Toxoplasma gondii* using knockout strategies to pinpoint essential proteins for the parasite's survival. During my time at CRUK, I played a crucial role in the characterisation of the previously unknown gene Fam49B, now recognised as CYRI-B (Cyfip-related Rac Interactor-B). This work revealed CYRI-B as the first known negative regulator of the Scar/WAVE complex, which controls cell migration by regulating actin dynamics at the leading edge.
My expertise spans molecular and cellular biology, biochemistry, large-scale omics, and some in vivo studies. However, my primary focus has been on microscopy, utilising various advanced imaging techniques to explore the actin cytoskeleton. My imaging work has earned multiple awards, including features on the cover of *Focal Plane*.
Now, as a lecturer at the University of the West of Scotland (UWS), I teach mainly on biomedical sciences and the MSc One Health, while continuing my research on host-pathogen interactions, with a particular emphasis on *Toxoplasma gondii* . My current work focuses on the host factors that facilitate parasite entry and understanding how *Toxoplasma* selects its host cells.

Qualifications

Doctor of Philosophy, Infection and Immunity, University of Glasgow
Award Date: 6 Jan 2017

Master of Science, Molecular Parasitology, University of Glasgow
Award Date: 30 Sept 2012

Bachelor of Science (Hons.), Parasitology, University of Glasgow
Award Date: 30 Jun 2011

… → 3 Jun 2019 Associate Fellow of Recognised Excellence in Teaching, RET-AF

Employment

Lecturer

Lecturer
School of Health and Life Sciences
University Of The West Of Scotland
1 Aug 2022 → present

Post doctoral Researcher

CRUK Beatson Institute
United Kingdom
1 Oct 2016 → 1 Jul 2022

Research outputs

Scar/WAVE drives actin protrusions independently of its VCA domain using proline-rich domains

Buracco, S., Döring, H., Engelbart, S., Singh, S. P., Paschke, P., Whitelaw, J., Thomason, P. A., Paul, N. R., Tweedy, L., Lilla, S., McGarry, L., Corbyn, R., Claydon, S., Mietkowska, M., Machesky, L. M., Rottner, K. & Insall, R. H., 26 Sept 2024 , (E-pub ahead of print) In: Current Biology. 26 p.

Single-sample image-fusion upsampling of fluorescence lifetime images
Kapitany, V., Fatima, A., Zickus, V., Whitelaw, J., McGhee, E., Insall, R., Machesky, L. & Faccio, D., 23 May 2024, In: Science Advances. 10, 21, 12 p., adn0139.

CYRI-B mediated macropinocytosis drives metastasis via lysophosphatidic acid receptor uptake
Nikolaou, S., Juin, A., Whitelaw, J. A., Paul, N., Fort, L., Nixon, C., Spence, H. J., Bryson, S. & Machesky, L. M., 7 May 2024, (E-pub ahead of print) In: eLife. 83712.

Collagen VI expression is negatively mechanosensitive in pancreatic cancer cells and supports the metastatic niche
Papalazarou, V., Drew, J., Juin, A., Spence, H. J., Whitelaw, J., Nixon, C., Salmeron-Sanchez, M. & Machesky, L. M., 22 Dec 2022, In: Journal of cell science. 135, 24, p. 1-16 16 p.

Super-resolution time-resolved imaging using computational sensor fusion
Callenberg, C., Lyons, A., den Brok, D., Fatima, A., Turpin, A., Zickus, V., Machesky, L., Whitelaw, J., Faccio, D. & Hullin, M. B., 18 Jan 2021, In: Scientific Reports. 11, 8 p., 1689.

Fluorescence lifetime imaging with a megapixel SPAD camera and neural network lifetime estimation
Zickus, V., Wu, M.-L., Morimoto, K., Kapitany, V., Fatima, A., Turpin, A., Insall, R., Whitelaw, J., Machesky, L., Bruschini, C., Faccio, D. & Charbon, E., 2 Dec 2020, In: Scientific Reports. 10, 10 p., 20986.

The WAVE regulatory complex is required to balance protrusion and adhesion in migration
Whitelaw, J. A., Swaminathan, K., Kage, F. & Machesky, L. M., 7 Jul 2020, In: Cells. 9, 7, 22 p., 1635.

Apicomplexan F-actin is required for efficient nuclear entry during host cell invasion
Del Rosario, M., Periz, J., Pavlou, G., Lyth, O., Latorre-Barragan, F., Das, S., Pall, G. S., Stortz, J. F., Lemgruber, L., Whitelaw, J. A., Baum, J., Tardieux, I. & Meissner, M., 5 Dec 2019, In: EMBO reports. 2019, 20, 18 p., e48896.

CYRI/ Fam49 proteins represent a new class of Rac1 interactors
Whitelaw, J. A., Lilla, S., Paul, N. R., Fort, L., Zanivan, S. & Machesky, L. M., 23 Jul 2019, In: Communicative & Integrative Biology. 12, 1, p. 112-118 7 p.

Fam49/CYRI interacts with Rac1 and locally suppresses protrusions
Fort, L., Batista, J. M., Thomason, P. A., Spence, H. J., Whitelaw, J. A., Tweedy, L., Greaves, J., Martin, K. J., Anderson, K. I., Brown, P., Lilla, S., Neilson, M. P., Tafelmeyer, P., Zanivan, S., Ismail, S., Bryant, D. M., Tomkinson, N. C. O., Chamberlain, L. H., Mastick, G. S. & Insall, R. H. & 1 others, Machesky, L. M., 31 Oct 2018, In: Nature Cell Biology. 20, p. 1159-1171 13 p.

Parasites lacking the micronemal protein MIC2 are deficient in surface attachment and host cell egress, but remain virulent *in vivo*
Gras, S., Jackson, A., Woods, S., Pall, G., Whitelaw, J., Leung, J. M., Ward, G. E., Roberts, C. W. & Meissner, M., 24 Jul 2017, In: Wellcome Open Research. 2, 27 p., 32.

Toxoplasma gondii F-actin forms an extensive filamentous network required for material exchange and parasite maturation
Periz, J., Whitelaw, J., Harding, C., Gras, S., Minina, M. I. D. R., Latorre-Barragan, F., Lemgruber, L., Reimer, M. A., Insall, R., Heaslip, A. & Meissner, M., 31 Mar 2017, In: eLife. 6, 29 p., e24119.

Surface attachment, promoted by the actomyosin system of *Toxoplasma gondii* is important for efficient gliding motility and invasion
Whitelaw, J. A., Latorre-Barragan, F., Gras, S., Pall, G. S., Leung, J. M., Heaslip, A., Egarter, S., Andenmatten, N., Nelson, S. R., Warshaw, D. M., Ward, G. E. & Meissner, M., 18 Jan 2017, In: BMC biology. 15, 23 p., 1.

The Dynamic Nature and Functions of Actin in Toxoplasma Gondii
Whitelaw, J., 6 Jan 2017, Glasgow: University of Glasgow. 239 p.

Toxoplasma gondii establishes an extensive filamentous network consisting of stable F-actin during replication
Periz, J., Whitelaw, J., Harding, C., Lemgruber, L., Gras, S., Reimer, M., Insall, R. & Meissner, M., 1 Jul 2016

The toxoplasma Acto-MyoA motor complex is important but not essential for gliding motility and host cell invasion. Egarter, S., Andenmatten, N., Jackson, A. J., Whitelaw, J. A., Pall, G., Black, J. A., Ferguson, D. J. P., Tardieux, I., Mogilner, A. & Meissner, M., 14 Mar 2014, In: PLoS ONE. 9, 3, 17 p., 0091819.

Apical membrane antigen 1 mediates apicomplexan parasite attachment but is dispensable for host cell invasion. Bargieri, D. Y., Andenmatten, N., Lagal, V., Thiberge, S., Whitelaw, J. A., Tardieux, I., Meissner, M. & Ménard, R., 10 Oct 2013, In: Nature Communications. 4, 13 p., 2552.