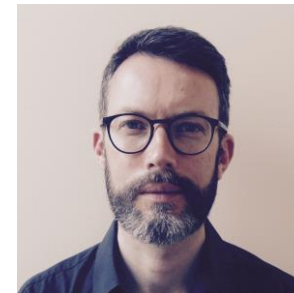


# Optological Laboratory, Department of Optometry & Vision Sciences

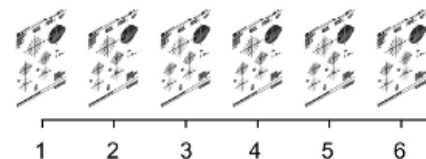
The Optological Laboratory uses *behavioural methods* to investigate how the human visual system processes information, thereby furthering our understanding of how the eye sees, as well as allowing more effective clinical tests of vision to be developed.



A/Prof. Andrew  
Anderson  
aaj@unimelb.edu.au

## Recent work:

- Monitoring Vision Loss in Glaucoma<sup>1,2</sup>
- Blue Blocking Lenses
  - Ophthalmologists<sup>3</sup> & Optometrists<sup>4</sup> understanding & use of these lenses
  - Do they work?<sup>5</sup>
- Analysing Motion Sensitivity<sup>6</sup> and How it Changes With Ageing<sup>7</sup>
- Quantifying Observers' Aesthetic Preferences<sup>8</sup>



1. ANDERSON A. J., GARDINER S. K. (2020). Using the rate of glaucomatous visual field progression in one eye to help assess the rate in the fellow eye. *Ophthalmology Glaucoma* 3(5):360-368.  
2. ANDERSON A. J., BEDGGOOD P. A., KONG Y. X. G., MARTIN K. R., VINGRYS A. J. (2017). Can home monitoring allow earlier detection of rapid visual field progression in glaucoma? *Ophthalmology* 124(12):1735-1742.  
3. SINGH S., ANDERSON A. J., WATSON S. L., DOWNIE L. E. (2020). Are current ophthalmology clinical practices relating to blue light-filtering intraocular lenses evidence-based? *Clinical & Experimental Ophthalmology* 48(1):125-127.  
4. SINGH S., ANDERSON A. J., DOWNIE L. E. (2019). Insights into Australian optometrists' knowledge and attitude towards prescribing blue light-blocking ophthalmic devices. *Ophthalmic & Physiological Optics* 39(3):194-204.  
5. SINGH S., DOWNIE L. E., ANDERSON A. J. (2021). Do blue-blocking lenses reduce eye strain from extended screen time? A double-masked, randomized controlled trial. *American Journal of Ophthalmology* 226: 243-251.  
6. PARK A. S. Y., BEDGGOOD P., METHA A. B., ANDERSON A. J. (2019). The Influence of perceptual stabilisation on perceptual grouping of temporally asynchronous stimuli. *Vision Research* 160:1-9  
7. SEPULVEDA J., ANDERSON A. J., WOOD J. M., McKENDRICK A. M. (2020). Differential ageing effects in motion perception tasks for central and peripheral vision. *Journal of Vision* 20.5.8  
8. ANDERSON A. J., AMARASEKARA P., KUMAR N. Y., LIAPIS G. V., PAL W., SINGH P., WILLIAMS J. J. (2022). Aesthetic appeal is no coincidence: preference for generic over specific viewpoints. *Vision Research*

# Ocular Physiology Laboratory

## Department of Optometry & Vision Sciences



Head: [A/Professor Bang Bui](#)

- **Interests:**

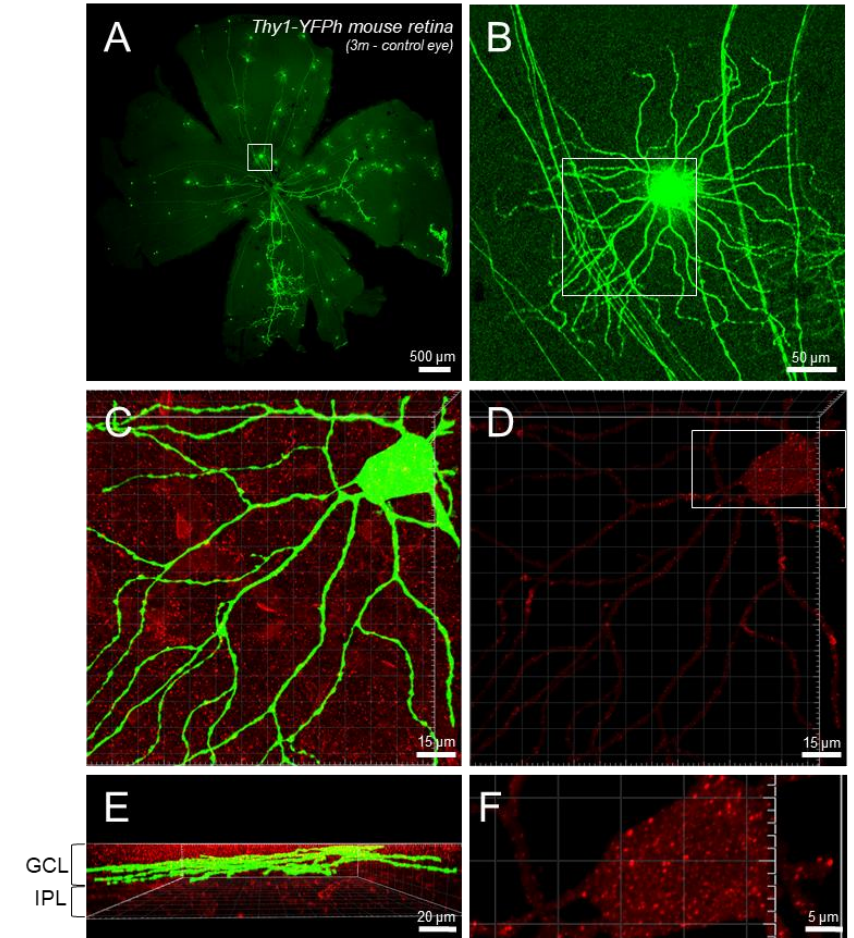
- Mechanisms of age-related neurodegeneration
- Glaucoma, Diabetic eye disease, Macular degeneration
- Electrophysiology and imaging of the retina/visual pathway

- **Recent papers:**

- Heriot et al. 2022 Optimizing retinal thermofusion in retinal detachment repair: achieving instant adhesion without air tamponade. *Ophthalmology Science*. doi:10.1016/j.xops.2022.100179.
- Lee et al. The Effect of Aging on Retinal Function and Retinal Ganglion Cell Morphology Following Intraocular Pressure Elevation. *Front Aging Neurosci*. 2022 May 12;14:859265. doi: 10.3389/fnagi.2022.859265.
- Mills et al. Fractalkine-induced microglial vasoregulation occurs within the retina and is altered early in diabetic retinopathy. *Proc Natl Acad Sci U S A*. 2021 Dec 21;118(51):e2112561118.
- Grant et al. Blocking endothelial apoptosis revascularises the retina in a model of ischemic retinopathy. *J Clin Invest*. 2020 May 19:127668. doi: 10.1172/JCI127668.
- Hadoux X et al.. Non-invasive in vivo hyperspectral imaging of the retina for potential biomarker use in Alzheimer's disease. *Nat Commun*. 2019 Sep 17;10(1):4227.

- **Email: [bvb@unimelb.edu.au](mailto:bvb@unimelb.edu.au)**

Autophagy in retinal ganglion cells



Green – intrinsically fluorescent retinal ganglion cells (RGCs)  
Red – LC3 puncta

# Cheng Laboratory – DAP, Peter Mac

- inter-organ communication
- cancer cachexia
- stem cells
- [louise.cheng@petermac.org](mailto:louise.cheng@petermac.org)



A/Prof Louise Cheng  
Department of Anatomy and Physiology  
Peter MacCallum Cancer Center

Article | 10 March 2021 |  FREE ACCESS

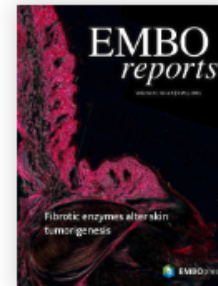
 SOURCE DATA |  TRANSPARENT PROCESS

## Glial Hedgehog signalling and lipid metabolism regulate neural stem cell proliferation in *Drosophila*

Qian Dong , Michael Zavortink, Francesca Foldi, Sofya Golenkina, Tammy Lam, Louise Y Cheng  

[Author Information](#)

EMBO Reports (2021) 22: e52130 | <https://doi.org/10.15252/embr.202052130>



[About the cover](#)

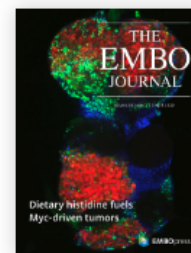
Article | 25 February 2019 |  OPEN ACCESS

 TRANSPARENT PROCESS

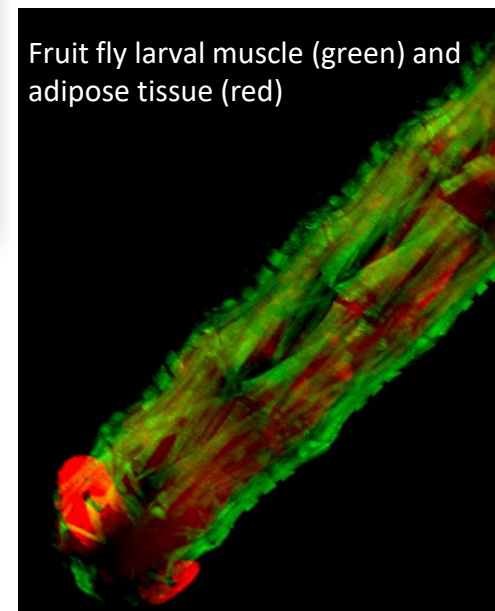
## Histidine is selectively required for the growth of Myc-dependent dedifferentiation tumours in the *Drosophila* CNS

Francesca Foldi, Panayotis Pachnis, Milán Szuperák, Olivia Costas, Tharindu Fernando, Alex P Gould,

Louise Y Cheng  



[About the cover](#)



Fruit fly larval muscle (green) and adipose tissue (red)



Fruit fly model of cancer cachexia, where tumour (green) causes the breakdown of the adipose tissue (red)

Images from Lodge et al., 2021, Dev Cell



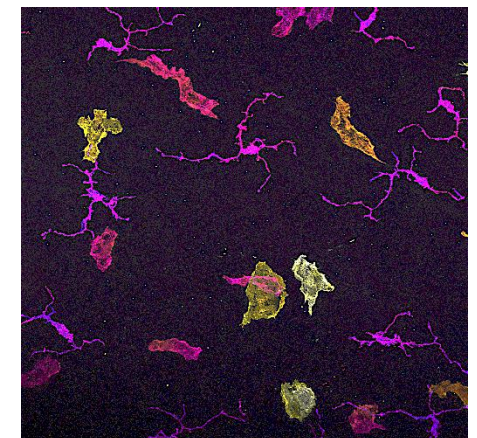
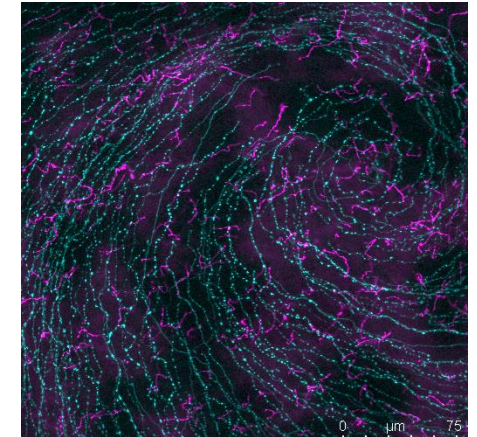
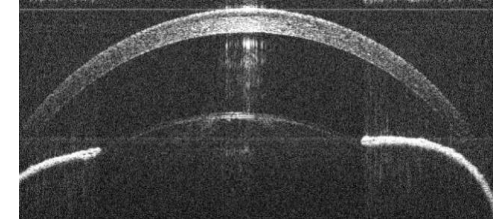
# Corneal neuroimmunology, Department of Optometry & Vision Sciences

## • Interests:

- Topical decorin to treat corneal neuropathy and fibrosis
- Neuroimmune cross-talk in the normal and inflamed cornea
- The effect of systemic diseases on corneal neuroimmunology
- Identification of nerve and immune cell subsets in the cornea and conjunctiva
- Meibomian gland orifice associated immune cells



Dr Holly Chinnery



Email: [holly.chinnery@unimelb.edu.au](mailto:holly.chinnery@unimelb.edu.au)

Contents lists available at ScienceDirect

Progress in Retinal and Eye Research

journal homepage: [www.elsevier.com/locate/preteyeres](http://www.elsevier.com/locate/preteyeres)

ELSEVIER

Neuroimmune crosstalk in the cornea: The role of immune cells in corneal nerve maintenance during homeostasis and inflammation

Mengliang Wu<sup>a</sup>, Lisa J. Hill<sup>b</sup>, Laura E. Downie<sup>a,1</sup>, Holly R. Chinnery<sup>a,1</sup>

<sup>a</sup> Department of Optometry and Vision Sciences, The University of Melbourne, Parkville, Victoria, Australia  
<sup>b</sup> School of Biomedical Sciences, Institute of Clinical Sciences, University of Birmingham, Birmingham, United Kingdom, B15 2TT, United Kingdom

RESEARCH Open Access

Novel alterations in corneal neuroimmune phenotypes in mice with central nervous system tauopathy

Haihan Jiao<sup>1</sup>, Laura E. Downie<sup>1</sup>, Xin Huang<sup>2</sup>, Mengliang Wu<sup>1</sup>, Sara Oberrauch<sup>3,4</sup>, Ryan J. Keenan<sup>3,4</sup>, Laura H. Jacobson<sup>3,4\*</sup> and Holly R. Chinnery<sup>1\*</sup>

Check for updates

The neuroregenerative effects of topical decorin on the injured mouse cornea

Mengliang Wu<sup>1</sup>, Laura E. Downie<sup>1</sup>, Liam M. Grover<sup>2</sup>, Richard J. A. Moakes<sup>2</sup>, Saaeha Rauz<sup>3,4</sup>, Ann Logan<sup>4</sup>, Haihan Jiao<sup>1</sup>, Lisa J. Hill<sup>5</sup> and Holly R. Chinnery<sup>1\*</sup>

Check for updates

# Coin Laboratory – DMI, Doherty Institute

- Interests:

- Deep learning and computational biology
- Transcriptional response to infection
- Clinical metagenomics
- Antimicrobial resistance
- Direct sequence of *Mycobacterium tuberculosis* from sputum

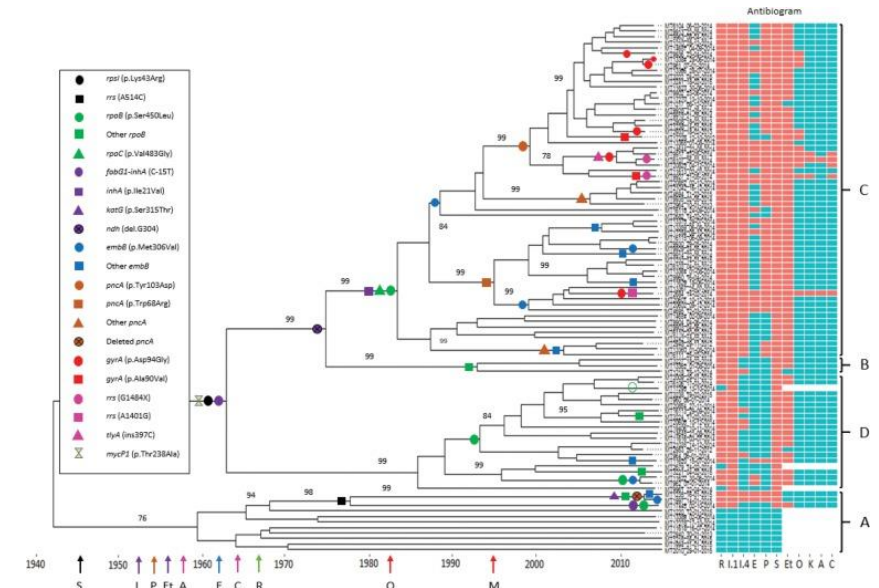
- Recent papers:

- Chang, J. J. Y., Rawlinson, D., Pitt, M. E., Tairaoa, G., Gleeson, J., Zhou, C., ... & Coin, L. J. (2021). Transcriptional and epi-transcriptional dynamics of SARS-CoV-2 during cellular infection. *Cell Reports*, 35(6), 109108.
- Li, Fuyi, Xudong Guo, Peipei Jin, Jinxiang Chen, Dongxu Xiang, Jiangning Song, and Lachlan JM Coin. "Porpoise: a new approach for accurate prediction of RNA pseudouridine sites." *Briefings in bioinformatics* 22, no. 6 (2021): bbab245.

- Email: [lachlan.coin@unimelb.edu.au](mailto:lachlan.coin@unimelb.edu.au)



Prof. Lachlan Coin



# Cook group – DMI, Doherty Institute

- Interests:

- Role of **human Tregs** in memory responses to bacterial and viral pathogens
- Organoid/immune cell co-culture to uncover unique functions of blood and gut-derived Tregs
- How Tregs communicate with gut dendritic cells and the enteric nervous system to maintain intestinal homeostasis

- Recent papers:

- Kennedy AE\*, Cook L\*, et al. (2021). Lasting changes to circulating leukocytes in people with mild SARS-CoV-2 infections. *Viruses*. 13(11):2239.
- Cook L, et al. (2021). Induction of stable human FOXP3+ Tregs by a parasite-derived TGF- $\beta$  mimic. *Immunol Cell Biol*. 99(8):833-847.
- Cook L, et al. (2021). Fecal microbiota transplant treatment for recurrent *Clostridioides difficile* infection enhances adaptive immunity to TcdB. *Gastroenterology*. 160(6):2155-2158.e4.

- Email: [l.cook@unimelb.edu.au](mailto:l.cook@unimelb.edu.au)

- Twitter: [@drlaura\\_cook](https://twitter.com/drlaura_cook)



Dr. Laura Cook





# Anterior Eye, Clinical Trials and Research Translation Unit Department of Optometry and Vision Sciences

Associate Professor Laura Downie, Email: [ldownie@unimelb.edu.au](mailto:ldownie@unimelb.edu.au)



Aim: To advance eye care and improve patient outcomes  
by developing and translating new diagnostics and therapeutics into clinical practice

## BROAD RESEARCH THEMES

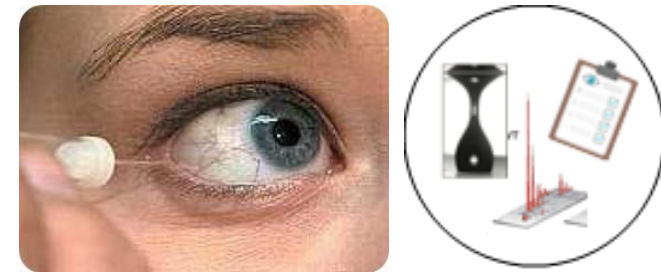
**Tears** as a platform for understanding human health

**Corneal imaging** as a window to the immune system

**Clinical trials** (Phase I to IV) of new drugs and devices

Cornea, Tear Film, Dry Eye, Contact Lenses, Presbyopia

**Systematic reviews** and meta-analyses to support the translation of  
evidence into practice



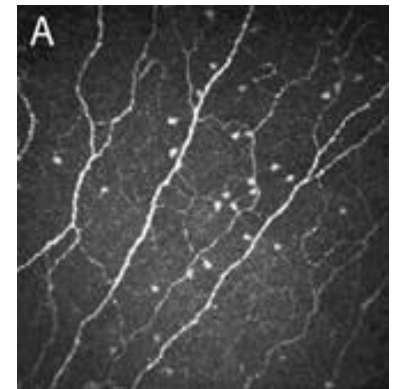
## KEY TECHNIQUES

*In vivo* confocal microscopy (IVCM)

Microlitre tear 'omic' analyses (lipidomics, proteomics, multiplex-CBA)

Advanced clinical assessments:

non-contact corneal aesthesiometry, tear osmolarity



Corneal *in vivo* confocal microscopy  
showing sensory nerves and  
immune cells in a human

# Davies Laboratory – DMI, Doherty Institute

- Interests:

- Population genomics of bacterial pathogens, esp. *Streptococci* and *Salmonella*
- Genomics informed vaccine design
- Linking genotype to phenotype

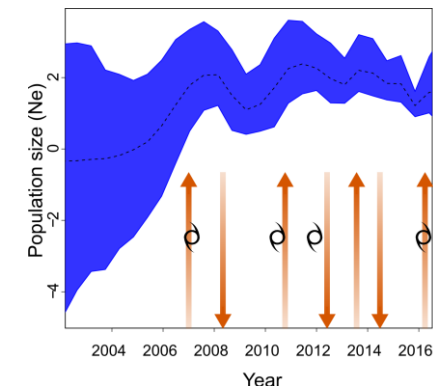
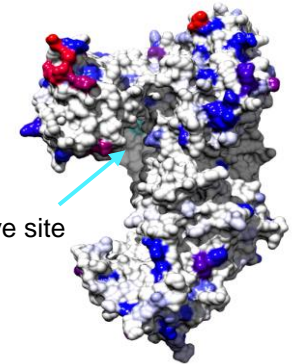
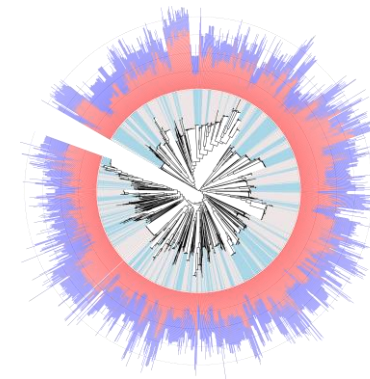
- Recent papers:

- Genomic epidemiology of *Salmonella* Typhi in Central Division, Fiji, 2012 to 2016. Davies MR et al Strugnell RA Singh S, Wilksch JJ, et al. *Lancet Reg Health West Pac.* 2022 doi: 10.1016/j.lanwpc.2022.100488.
- Atlas of group A streptococcal vaccine candidates compiled using large-scale comparative genomics. Davies MR et al. *Nat Genet.* 2019 doi: 10.1038/s41588-019-0417-8.

- Email: [mark.davies1@unimelb.edu.au](mailto:mark.davies1@unimelb.edu.au)



Dr. Mark Davies



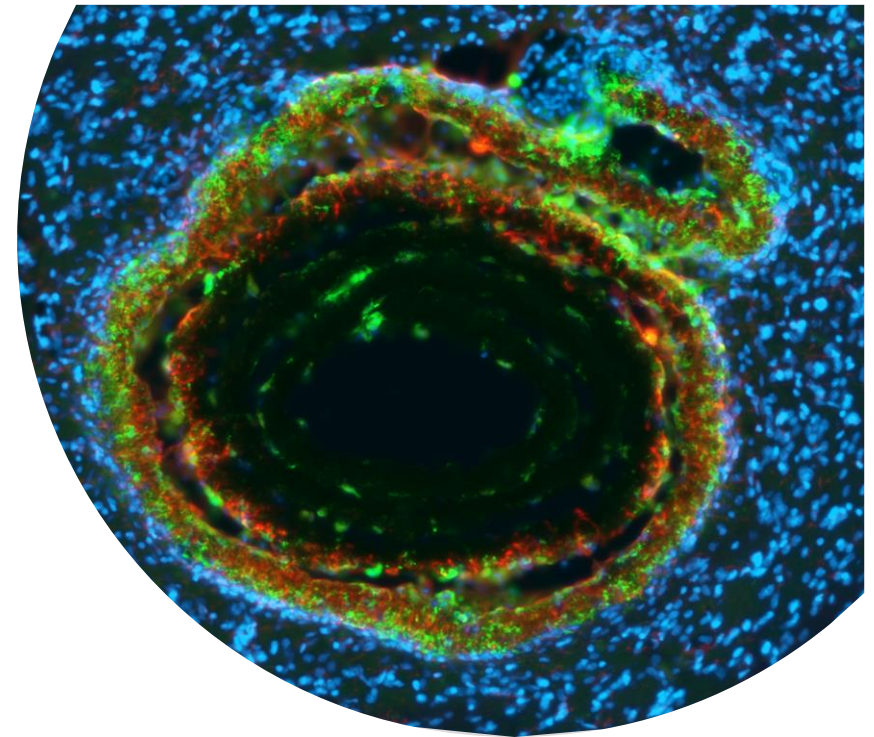
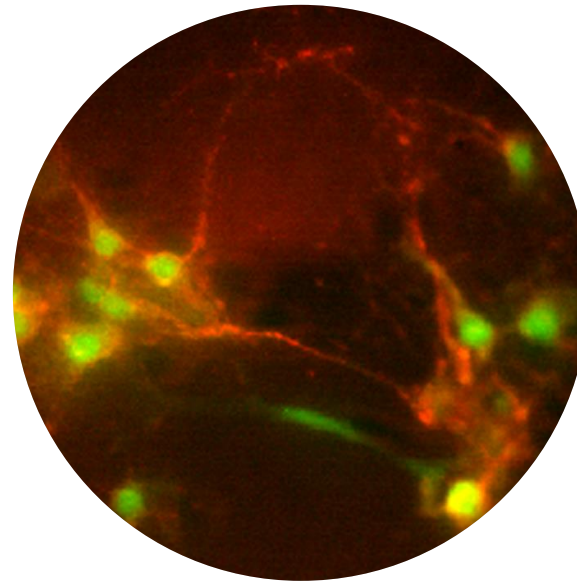


# Crack Lab – Neuropharmacology, DBP

- We are a currently group of 12 people.
- We are investigating the role that neuroinflammation plays in the predisposition of neuropathology in both Alzheimer's and Parkinson's disease.
- We are interested in microglia and the role of the type-I interferon system in driving neuroinflammation.
- We are interested in how bioactive materials can be used to re-build the brain.
- *Email: [pcrack@unimelb.edu.au](mailto:pcrack@unimelb.edu.au)*



Prof Peter Crack



# Ghosal Laboratory – DBP, Bio21 Institute

- **Interests:**

- Understanding host-pathogen interaction at nanometer resolution
- *In situ* structural biology: resolving structures of macromolecular machines inside intact cells
- Method development in cryo-electron microscopy specifically, in cryo-electron tomography

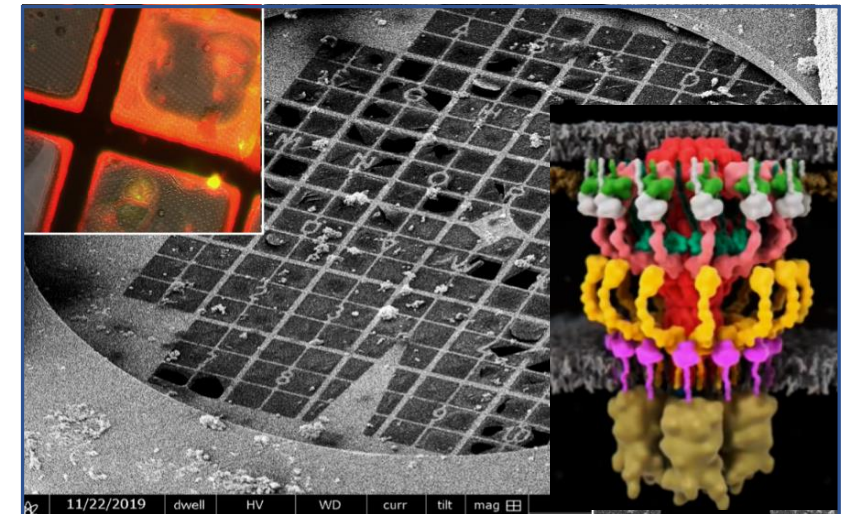


Dr. Debnath Ghosal

- **Recent papers:**

- Archaic chaperone-usher pili self-secrete into superelastic zigzag springs. Pakharukova *et al.* Nature 2022 Jul 19. doi: 10.1038/s41586-022-05095-0
- *In vivo* structure of the *Legionella* type II secretion system by electron cryotomography. Ghosal *et al.* Nature Microbiology, 2019 Dec;4(12):2101-2108.
- Molecular architecture, polar targeting and biogenesis of the *Legionella* Dot/Icm T4SS. Ghosal *et al.* Nature Microbiology, 2019 Jul;4(7):1173-1182.

- **Email:** [debnath.ghosal@unimelb.edu.au](mailto:debnath.ghosal@unimelb.edu.au)



<https://ghosallab.com/>

# Haque Laboratory – DMI, Doherty Institute

## Interests:

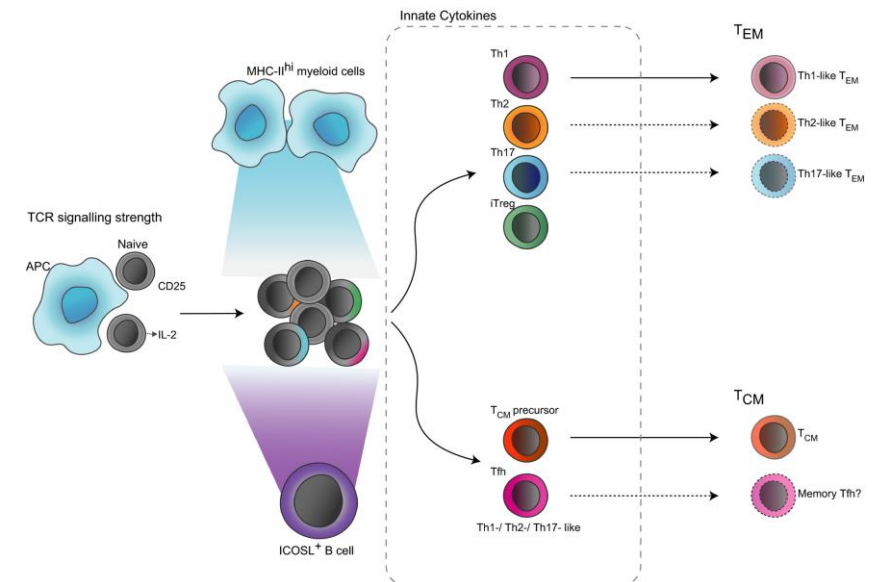
- T and B cell-dependent immunity to malaria
  - Single-cell genomics
  - Spatial transcriptomics
  - Bioinformatics and Computational Biology (in R and Python)
- 
- Soon MSF, Lee HJ, Engel JA.....**Haque A**. Transcriptome dynamics of CD4<sup>+</sup> T cells during malaria maps gradual transit from effector to memory. *Nature Immunology*. 2020 Dec;21(12):1597-1610.
  - Engel JA, Lee HJ, Williams CG.....**Haque A**. Single-cell transcriptomics of alloreactive CD4<sup>+</sup> T cells over time reveals divergent fates during gut graft-versus-host disease. *JCI Insight* 2020 Jul 9;5(13):e137990.
  - Akter J.....**Haque A**. Plasmodium-specific antibodies block in vivo parasite growth without clearing infected red blood cells. *PLoS Pathog*. 2019 Feb 27;15(2):e1007599
  - Lönnberg T, Svensson V, James KR....**Haque A\***, **Teichmann SA\*** (\* **Co-Senior**) Single-cell RNA-seq and computational analysis using temporal mixture modelling resolves Th1/Tfh fate bifurcation in malaria *Science Immunology* 2017 Mar 3;2(9). pii: eaal2192. doi: 10.1126/sciimmunol.aal2192.



A/Prof. Ash Haque

Twitter: @DrAshHaque

E-mail: Ashraful.haque@unimelb.edu.au



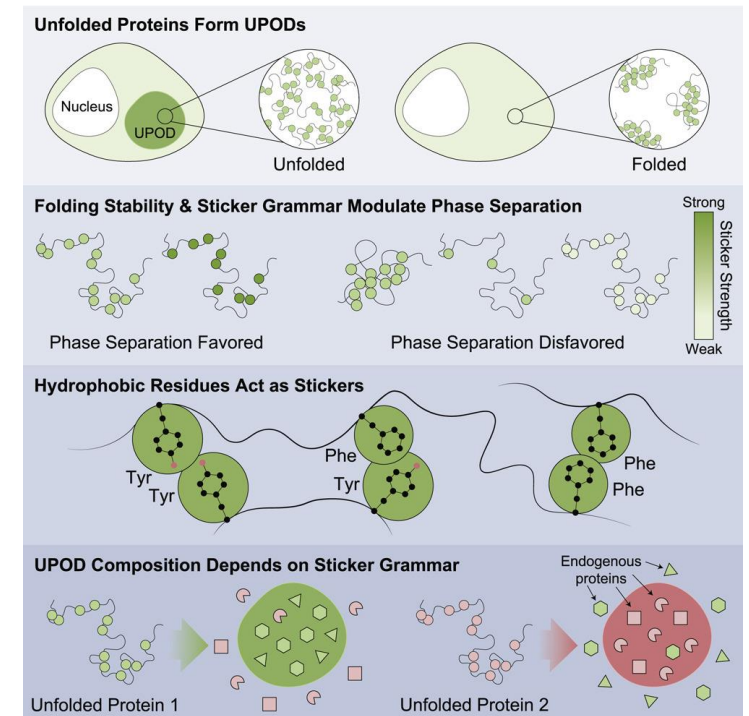


# Hatters Laboratory – DBP, Bio21 Institute

- Interests:
  - Mechanisms of protein folding and misfolding
  - Protein aggregation in neurodegenerative diseases
  - “Protein painting” methods to understand protein networks and conformation in cells
- Recent papers:
  - Hidden information on protein function in censuses of proteome foldedness. Cox, D, Ang, CS, Nillegoda, NB, Reid, GE, and Hatters, DM. *Nat Commun* 2022 doi: 1992. 10.1038/s41467-022-29661-2.
  - Sequence grammar underlying the unfolding and phase separation of globular proteins. Ruff, KM, Choi, YH, Cox, D, Ormsby, AR, Myung, Y, Ascher, DB, Radford, SE, Pappu, RV, and Hatters, DM. *Mol Cell*. 2022 doi: 10.1016/j.molcel.2022.06.024.
- Email: [dhatters@unimelb.edu.au](mailto:dhatters@unimelb.edu.au)



Prof. Danny Hatters



# Epigenetics & Neural Plasticity Laboratory, Florey Institute of Neuroscience and Mental Health, University of Melbourne

## Interests:

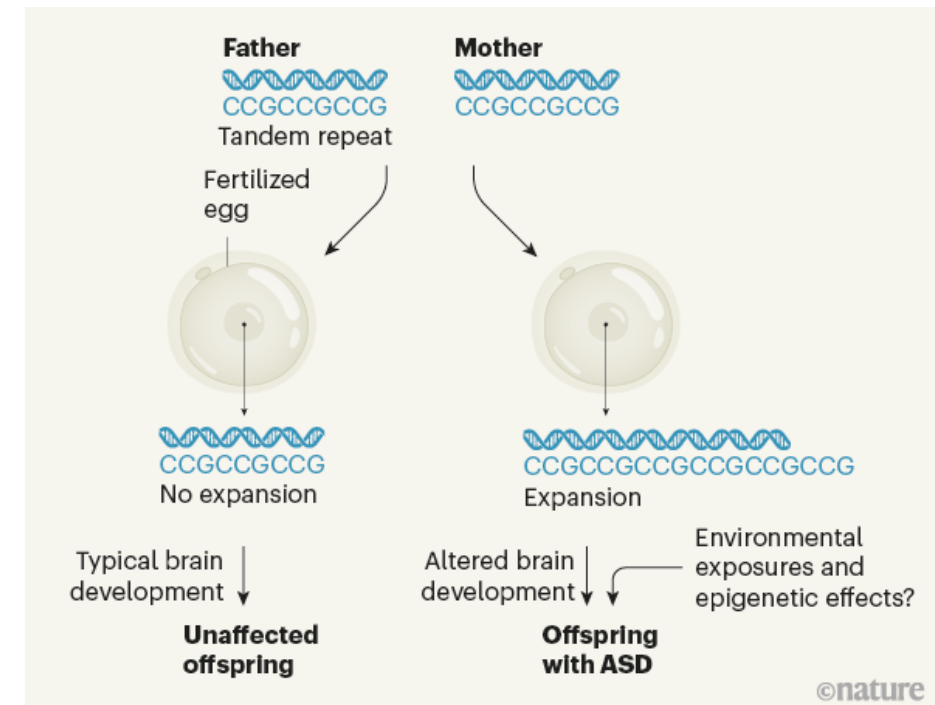
- **Gene-environment interactions mediating experience-dependent plasticity in the health and diseased brain**
- **Transgenerational epigenetic inheritance modulating brain function and dysfunction**
- **The microbiota-gut-brain axis in health and disease**

## Recent papers:

- Gubert C, Choo JM, Love CJ, Kodikara S, Masson BA, Liew JJM, Wang Y, Kong G, Narayana VK, Renoir T, Lê Cao KA, Rogers GB, Hannan AJ. Faecal microbiota transplant ameliorates gut dysbiosis and cognitive deficits in Huntington's disease mice. *Brain Commun.* 2022; 4(4):fcac205.
- Gubert C, Hannan AJ. Exercise mimetics: harnessing the therapeutic effects of physical activity. *Nature Rev. Drug Discov.* 2021; 20(11):862-879.
- Hannan AJ. Repeat DNA expands our understanding of autism spectrum disorder. *Nature* 2021; 589(7841):200-202.
- Hannan AJ. Paternal bloodlines sculpting seminal concepts: circulating factors as mediators of transgenerational 'epigenopathy' and 'epigenetic resilience'. *EMBO J.* 2020; 39(23):e107014.
- **Email: [anthony.hannan@florey.edu.au](mailto:anthony.hannan@florey.edu.au)**



Professor Anthony Hannan



# Heath Laboratory – DMI, Doherty Institute

- Interests:

- Mouse models of malaria Immunity
- Tissue resident memory T cells
- Vaccines for liver-stage malaria

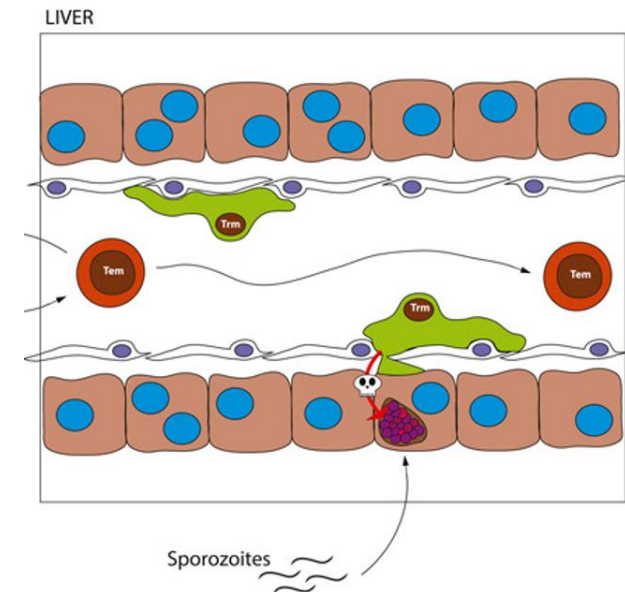
- Recent papers:

- Glycolipid-peptide vaccination induces liver-resident memory CD8+ T cells that protect against rodent malaria. *Science Immunology* 5(48):eaaz8035, 2020
- A Natural Peptide Antigen within the Plasmodium Ribosomal Protein RPL6 Confers Liver TRM Cell-Mediated Immunity against Malaria in Mice. *Cell Host Microbe*. 27(6):950-962.e7, 2020.

- Email: [wrheath@unimelb.edu.au](mailto:wrheath@unimelb.edu.au)



Prof. Bill Heath





# National Vision Research Institute and Department of Optometry & Vision Sciences

## Interests:

- Prosthetic vision: retinal and cortical implants
- Functional cortical architecture
- Carbon based electrodes for human implantation

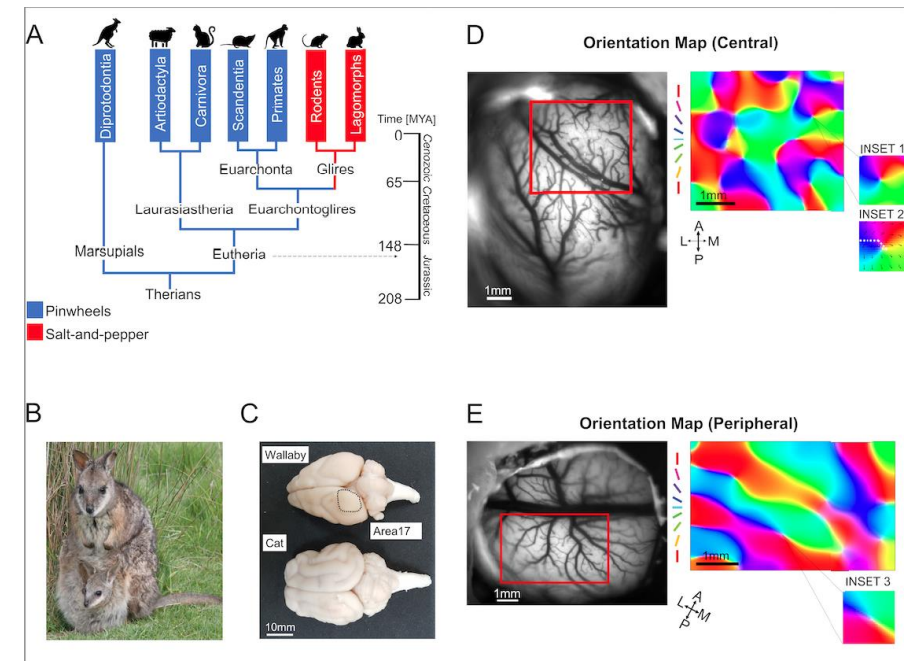


Prof. Michael Ibbotson

## Recent papers:

- Almasi A, Meffin H, Cloherty SL, Wong Y, Yunzab M, **Ibbotson MR** (2020). Mechanisms of feature selectivity and invariance in primary visual cortex. *Cerebral Cortex* May 5:bhaa102. doi: 10.1093/cercor/bhaa102
- Sun SH, Almasi A, Yunzab M, Zehra S, Hicks DG, Kameneva T, **Ibbotson MR**, Meffin H (2021). Analysis of extracellular spike waveforms and associated receptive fields of neurons in cat primary visual cortex. *J Physiol.* Apr;599(8):2211-2238 doi: 10.1111/JO280844
- Hejazi M, Tong W, **Ibbotson MR**, Prawer S, Garrett DJ (2021). Advances in carbon-based microfiber electrodes for neural interfacing. *Frontiers in Neuroscience.* Apr 12;15:658703 doi: 10.3389/fnins.2021.658703 (eCollection 2021)
- Almasi A, Sun S, Yunzab M, Jung J, Meffin H, **Ibbotson MR** (2022) How stimulus statistics affect the receptive fields of cells in primary visual cortex. *J Neuroscience* 42 (26):5198-5211 doi: 10.1523/JNEUROSCI.0664-21.2022
- Jung YJ, Almasi A, Sun S, Yunzab M, Cloherty SL, Baquier SH, Renfree M, Meffin H, **Ibbotson MR** (2022). Orientation pinwheels in primary visual cortex of a highly visual marsupial. *Science Advances* (accepted July 2022)

Email: [mibbotson@nvri.org.au](mailto:mibbotson@nvri.org.au)



First demonstration of orientation columns in the marsupial cortex

# Londrigan Laboratory – DMI, Doherty Institute

- **Interests:** we systematically investigate the host responses and cellular mechanisms that limit respiratory virus replication in airway macrophages.

- **Recent papers:**

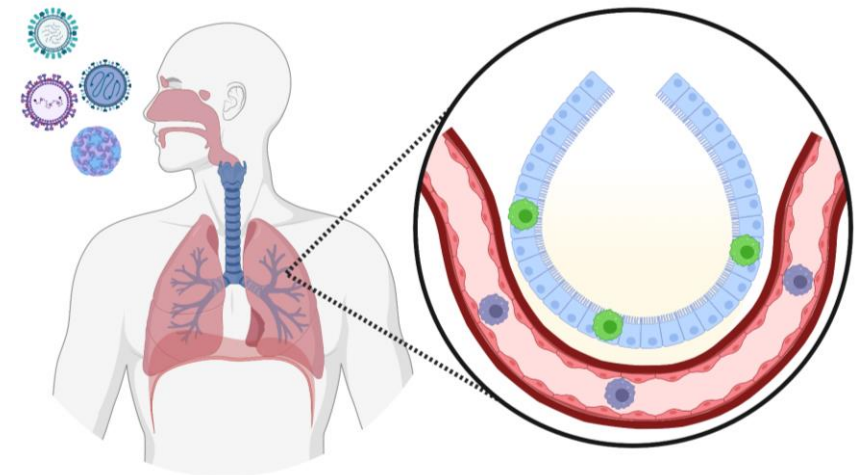
- Meischel T,... Reading PC, Londrigan SL. 2021. IFITM Proteins That Restrict the Early Stages of Respiratory Virus Infection Do Not Influence...J Virol 95:e0083721
- Londrigan SL, ..... Reading PC. 2020. IFITM3 and type I interferons are important for the control of influenza A virus replication in murine macrophages. Virology 540:17-22
- Gillespie L, Roosendahl P, Ng WC, Brooks AG, Reading PC, Londrigan SL. 2016. Endocytic function is critical for influenza A virus infection via DC-SIGN and L-SIGN. Sci Rep 6:19428

- **Email:** sarahl@unimelb.edu.au



Dr. Sarah Londrigan

influenza A viruses  
human metapneumovirus  
coronaviruses  
parainfluenza viruses  
rhinoviruses  
respiratory syncytial virus



# Hime Lab - Stem cell genetics and *Drosophila* models of human disease, DAP

## Research Interests

- Genetics and Developmental biology
- Stem cells
- *Drosophila*

## Recent papers:

Dominado N, et. al., (2016) Rbf regulates *Drosophila* spermatogenesis via control of somatic stem and progenitor cell fate in the larval testis. **Stem Cell Reports** 7(6):1152-1163

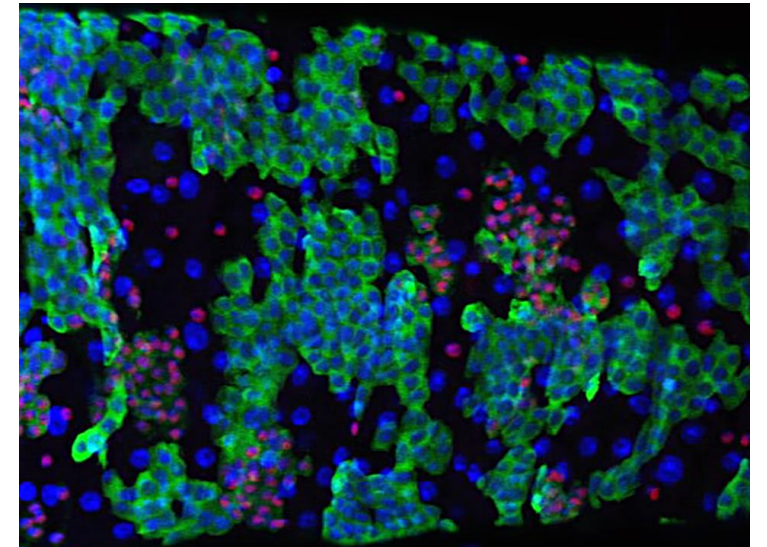
Horvay K, et. al., (2015) Snai1 regulates cell lineage allocation and stem cell maintenance in the mouse intestinal epithelium. **EMBO Journal**, 34(10):1319-35

Monk AC, et al., (2010) The RNA-binding protein HOW is required for stem cell maintenance in the testis and for the onset of transit amplifying divisions. **Cell Stem Cell** 6(4):348-60

Email: [g.hime@unimelb.edu.au](mailto:g.hime@unimelb.edu.au)



Professor Gary Hime





# Lawson Laboratory – DMI, Doherty Institute

## Interests:

Pathogenesis of Prion disease, Parkinson's disease and COVID-19 in the central and enteric nervous system

Role of the cellular form of the prion protein in the opposing disease processes of cancer and neurodegeneration.

## Recent papers:

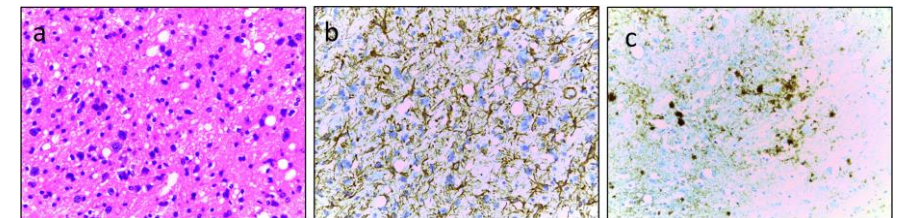
Diwakarla, *et al.* ATH434 Reverses Colorectal Dysfunction in the A53T Mouse Model of Parkinson's Disease. *J Parkinsons Dis.* 2021;11(4):1821-1832. doi: 10.3233/JPD-212731

Cheng, *et al.* Distribution of microRNA profiles in pre-clinical and clinical forms of murine and human prion disease. *Commun Biol.* 2021 Mar 25;4(1):411. doi: 10.1038/s42003-021-01868-x.

Email: [vlawson@unimelb.edu.au](mailto:vlawson@unimelb.edu.au)



Prof. Vicki Lawson



Spongiform change (a) astrocytic gliosis and the accumulation of the misfolded prion protein (c) in brain tissue of prion infected mouse.



# Vision Optimisation Laboratory, Departments of Optometry & Vision Sciences, Surgery (Ophthalmology) and Centre for Eye Research Australia

Head: Associate Professor Lauren Ayton

## Interests:

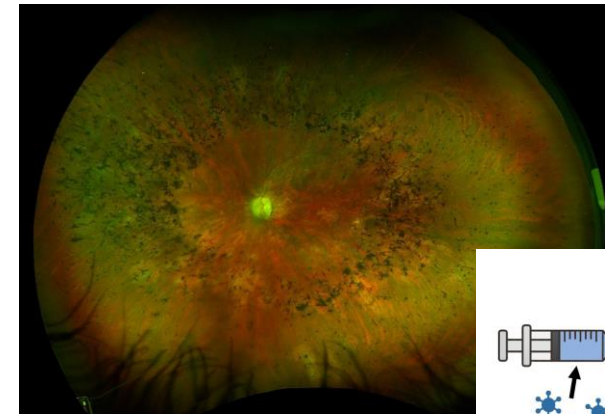
- Inherited retinal diseases and age-related macular degeneration
- Vision restoration therapies, such as gene therapy and bionic eyes
- Genotype/phenotype correlations, including advanced functional imaging such as adaptive optics and optical coherence tomography angiography
- Currently leading 6 industry clinical trials in IRD therapies (including gene therapy and oral pharmaceuticals)

## Recent papers:

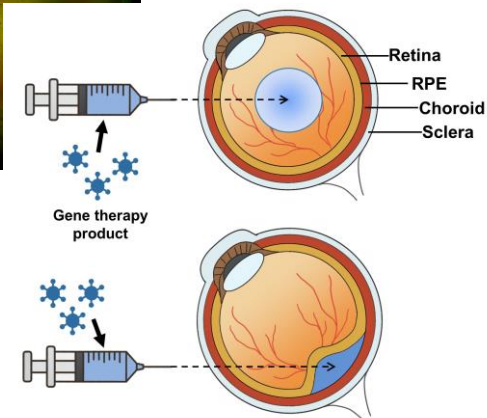
- Mack HG, Britten-Jones AC, ..., Ayton LN. Survey of perspectives of people with inherited retinal diseases on ocular gene therapy in Australia. *Nature Gene Therapy* 2022; Accepted 29 August 2022.
- Britten-Jones AC, O'Hare F, Edwards TL, Ayton LN for the VENTURE Study Consortium. The Victorian Evolution of Inherited Retinal Diseases Natural History Registry (VENTURE study): Rationale, methodology, and initial participant characteristics. *Clinical and Experimental Ophthalmology* 2022; accepted 16 May 2022.
- Britten-Jones AC, Gocuk SA, .. Ayton LN. The safety and efficacy of gene therapy treatment for monogenic retinal and optic nerve diseases: A systematic review. *Genetics in Medicine* 2022; 24(3):521-534.
- Petoe MA, Titchener SA, .., Ayton LN, Luu CD, Allen PJ. A second generation (44-channel) suprachoroidal retinal prosthesis: Interim clinical trial results. *Translational Vision Science & Technology* 2021; 10(10):12.



Email: [layton@unimelb.edu.au](mailto:layton@unimelb.edu.au)



*LEFT: Fundus image of a person with RPGR-associated rod-cone dystrophy*



*RIGHT: Schematic of the method of treatment with subretinal gene therapy*

# McCluskey Laboratory – DMI, Doherty Institute

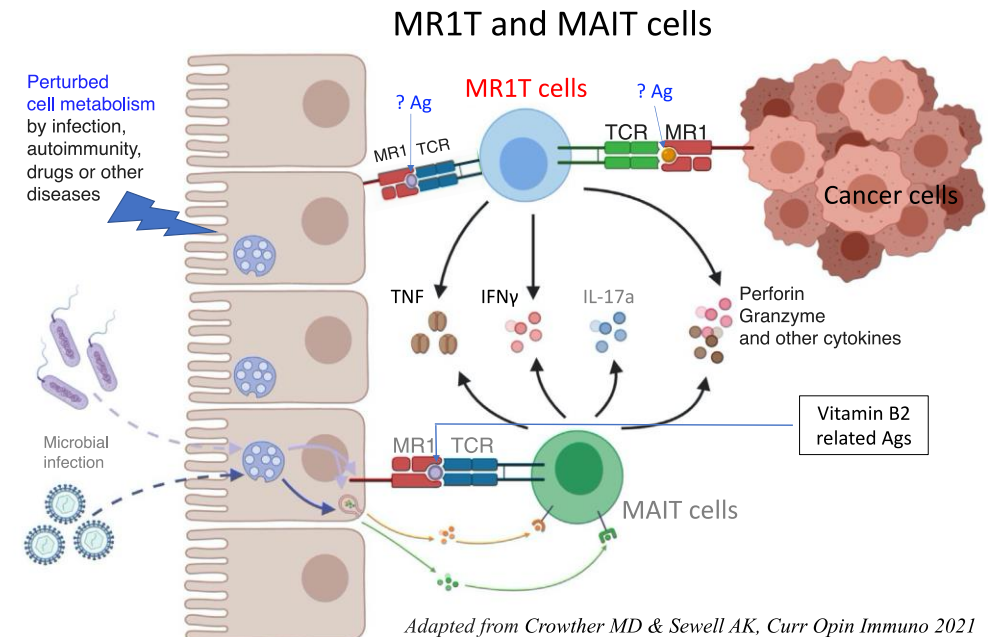
- Interests:

- MR1 (MHC-I related)-reactive T (MR1T) cell immunity in health and altered metabolism, including cancer
- Unconventional T cell (Mucosal-Associated invariant T (MAIT) cell) immunity in health and disease

- Recent papers:

- CD8 coreceptor engagement of MR1 enhances antigen responsiveness by human MAIT and other MR1-reactive T cells. M. Souter, et al. JEM, 2022
- The balance of interleukin-12 and interleukin-23 determines the bias of MAIT-1 versus MAIT-17 responses during bacterial infection. H. Wang et al, Immunology and Cell Biology. 2022

- Email: [zhenjun@unimelb.edu.au](mailto:zhenjun@unimelb.edu.au)  
[michael.souter@unimelb.edu.au](mailto:michael.souter@unimelb.edu.au)





# McDevitt Laboratory – DMI, Doherty Institute

## • Interests:

- Pathogenesis of bacterial pathogens, including *Streptococci*, *Pseudomonas*, and *Klebsiella*
- Developing new metal ion-based antimicrobials to break drug resistance in bacterial pathogens
- Understanding bacterial metal homeostasis and characterising metal transport pathways

## • Recent Papers:

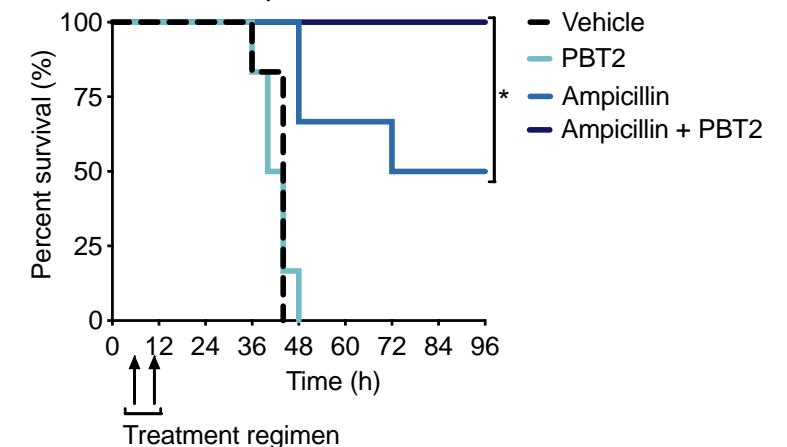
- Dysregulation of *Streptococcus pneumoniae* zinc homeostasis breaks ampicillin resistance in a pneumonia infection model. Brazel *et al.*, *Cell Reports* 2022 doi: 10.1016/j.celrep.2021.110202
- The structural basis of bacterial manganese import. Neville *et al.* *Science Advances* 2021 doi: 10.1126/sciadv.abg398
- Repurposing a neurodegenerative disease drug to treat Gram-negative antibiotic-resistant bacterial sepsis. De Oliveira *et al.* *Science Translation Medicine* 2021 doi: 10.1126/scitranslmed.abb379

- Email: [christopher.mcdevitt@unimelb.edu.au](mailto:christopher.mcdevitt@unimelb.edu.au)



Prof. Chris McDevitt

Rescuing antibiotic efficacy in mice to treat a pneumonia infection



# McDougall Laboratory - Florey Institute

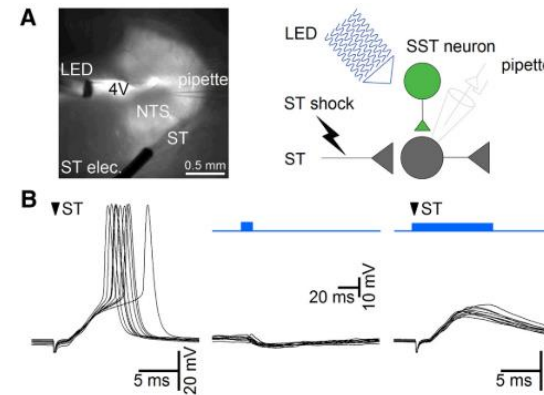
## Research Focus

- How does the brain integrate signals from internal organs?
- How does internal organ function impact behaviour and vice versa?
- Manipulating visceral sensory nerve function to affect behaviour (eating)
- Electrophysiology and imaging to animal behavioural assays.

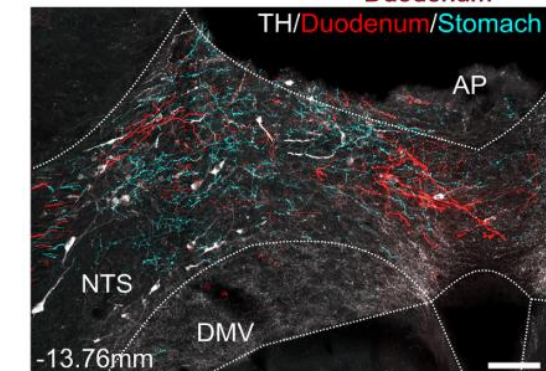
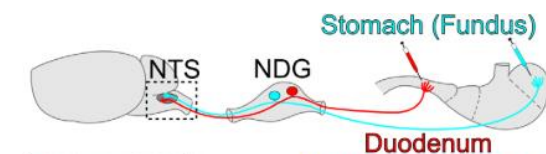
## Recent papers

- Bassi JK *et. al.* Analysis of the distribution of vagal afferent projections from different peripheral organs to the nucleus of the solitary tract in rats. 2022, J Comp Neurol doi: 10.1002/cne.25398
- Butler AG *et. al.* Use of a physiological reflex to standardize vagal nerve stimulation intensity improves data reproducibility in a memory extinction assay. 2021, Brain Stim doi: 10.1016/j.brs.2021.02.012
- Thek KR *et. al.* Extensive Inhibitory Gating of Viscerosensory Signals by a Sparse Network of Somatostatin Neurons. 2019, J Neurosci doi: 10.1523/JNEUROSCI.3036-18.2019

Email: [stuart.mcdougall@florey.edu.au](mailto:stuart.mcdougall@florey.edu.au)



Dr. Stuart McDougall



# Mackenzie Laboratory – DMI, Doherty Institute

- Interests:

- Flavivirus, Norovirus and Coronavirus
- Molecular virology, innate immunity
- Antiviral and vaccine development

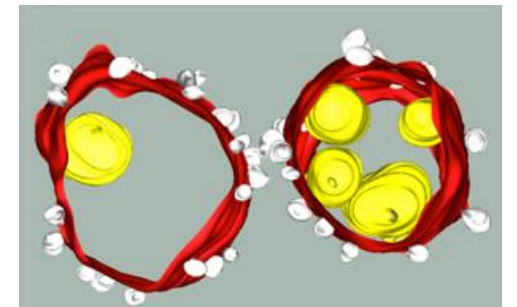
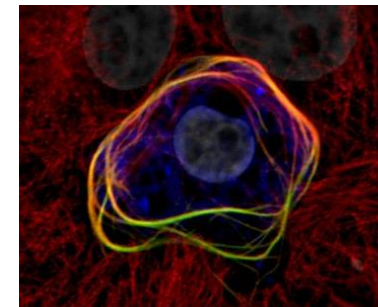
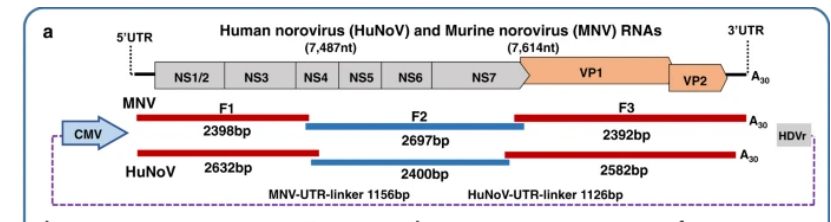
- Recent papers:

- Amarilla et al., (2021). A versatile reverse genetics platform for SARS-CoV-2 and other positive-strand RNA viruses. *Nat Commun.* 12(1):3431. doi: 10.1038/s41467-021-23779-5
- Manokaran et al., (2020). Modulation of acyl-carnitines, the broad mechanism behind Wolbachia-mediated inhibition of medically important flaviviruses in *Aedes aegypti*. *Proc Natl Acad Sci U S A.* 117:24475-24483. doi: 10.1073/pnas.1914814117

- Email: [jason.mackenzie@unimelb.edu.au](mailto:jason.mackenzie@unimelb.edu.au)



Prof. Jason Mackenzie



# McVernon group – DID, Doherty Institute

- Interests:

- Policy relevant infectious diseases modelling in Australia and the Asia-Pacific region
- Applied areas - emerging, vaccine preventable and neglected infectious diseases including key advisory role in Australia's national COVID-19 response

- Recent papers:

- Coronavirus disease model to inform transmission reducing measures and health system preparedness, Australia. Moss et al *Emerg Infect Dis* 2020 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7706956/>
- COVID-19 in low-tolerance border quarantine systems: impact of the Delta variant of SARS-CoV-2. Zachreson C et al *Science Advances* 2022 <https://www.science.org/doi/10.1126/sciadv.abm3624>
- <https://www.pmc.gov.au/national-plan-transition-australias-national-covid-response>

- Email: [j.mcvernon@unimelb.edu.au](mailto:j.mcvernon@unimelb.edu.au)



Prof. Jodie McVernon

The Doherty Institute modelling indicates that vaccinating around 70% of the population aged 16+ may allow Australia to transition to Phase B of Australia's National COVID-19 Response

Vaccination coverage is a continuum, with every increase reducing transmission and negative health outcomes.

Younger adults are peak transmitters of COVID-19, while older adults experience the most severe health impacts.

As supply allows, extending eligibility to all adults (16+) offers the greatest potential to slow down transmission.

Once around 70% of the population aged 16 and over is vaccinated, Australia may be able to move to Phase B of the National Plan without exceeding health system capacity, so long as this is combined with effective test, trace, isolate and quarantine and low-levels of ongoing restrictions and public health measures, including:

 Maintaining effective track and trace, isolation and quarantine	 Social distancing and capacity limits in commercial settings and workplaces
 2sqm social distancing (or density restrictions)	 Record keeping and COVID-safe plans

In Phase B, lockdowns are unlikely with low levels of ongoing restrictions.



# High-resolution retinal imaging laboratory, Department of Optometry & Vision Sciences

## • Interests:

- Tracking cellular flow in the smallest capillaries of the living human retina
- Functional imaging of photoreceptors to understand normal colour vision, and to develop novel sensitive outcome measures in retinal disease
- Developing new optical technology and image processing algorithms to advance the state-of-the-art in high-resolution retinal imaging

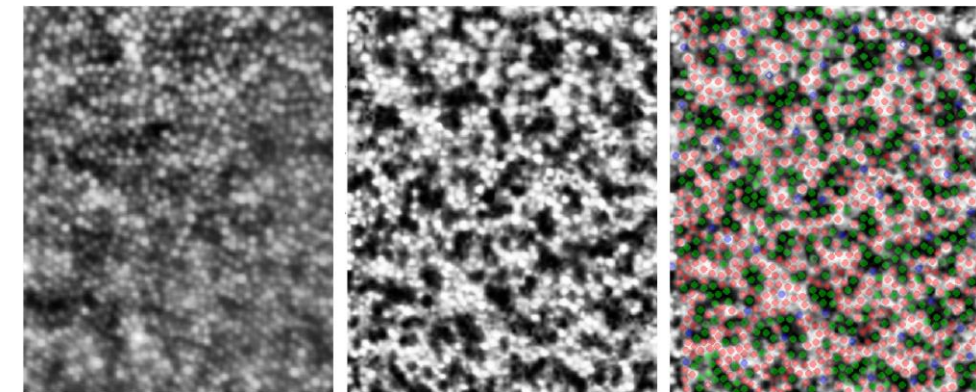
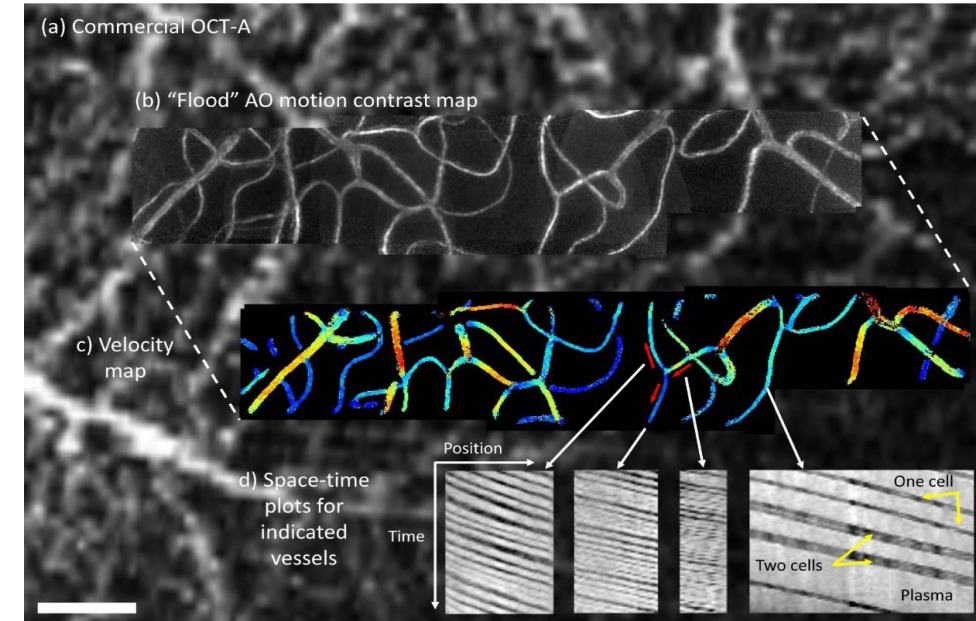


A/Prof Andrew Metha

## • Recent papers:

- Bedggood P, Metha A. Adaptive optics imaging of the retinal microvasculature. *Clinical and Experimental Optometry*. 2020 Jan 1;103(1):112-22.
- Bedggood P, Metha A. Towards distortion-free imaging of the eye. *PloS one*. 2021 Jun 10;16(6):e0252876.
- Bedggood P, Metha A. Direct measurement of pulse wave propagation in capillaries of the human retina. *Optics Letters*. 2021 Sep 15;46(18):4450-3.
- Bedggood P, Britten-Jones A, Ayton L, Metha A. Assessment of photoreceptor function with ultrafast retinal densitometry. *Biomedical Optics Express* 2022 (accepted 29.8.22).

• Email: [ametha@unimelb.edu.au](mailto:ametha@unimelb.edu.au)



Top: mapping capillary flow in the living diabetic retina (Bedggood & Metha, 2020)  
Bottom: Cell typing of the trichromatic cone photoreceptor mosaic (Bedggood et al. 2022)

# Mintern Laboratory – DBP, Bio21 Institute

- Interests:

- Dendritic cells
- Engineering advanced vaccines
- Molecular machinery of antigen presentation
- Ubiquitin
- CRISPR/Cas9 gene editing in immune cells

- Recent papers:

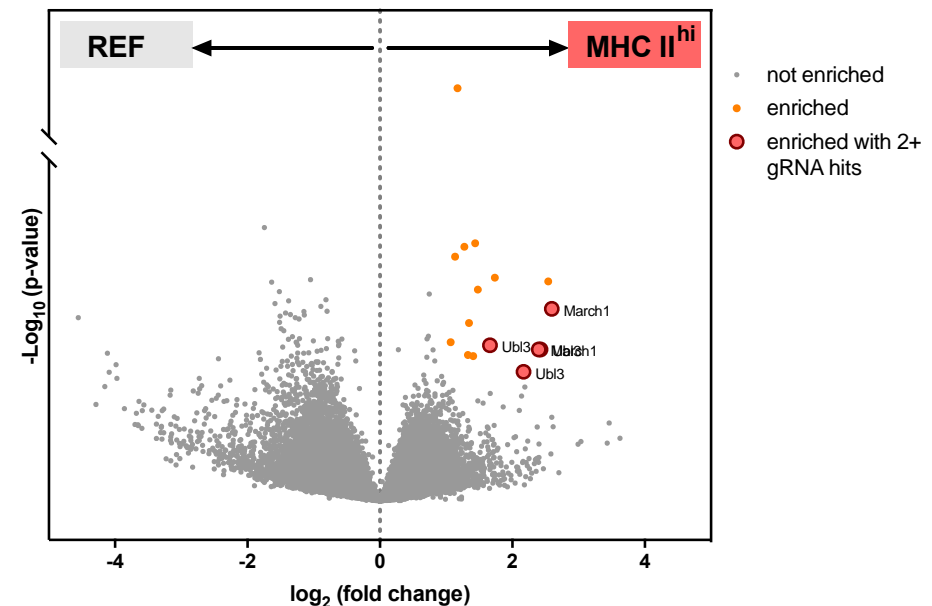
- Ubiquitin-like protein 3 (UBL3) is required for MARCH ubiquitination of major histocompatibility complex class II and CD86. Liu H. et al. *Nature Communications*. 2022 doi: 10.1038/s41467-022-29524-w.
- Marginal zone B cells acquire dendritic cell functions by trogocytosis. Schriek P. et al. *Science* 2022 doi: 10.1126/science.abf7470.

- Email: [jmintern@unimelb.edu.au](mailto:jmintern@unimelb.edu.au)



Prof. Justine Mintern

## Gene KOs causing increased MHC II



# Ocular Biomarker Laboratory, Department of Optometry & Vision Sciences

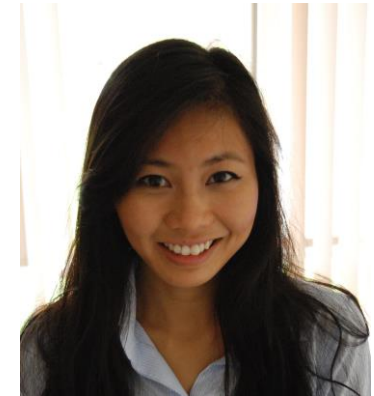
## Interests:

- Retinal biomarkers of Parkinson's disease
- Retinal biomarkers of Alzheimer's disease
- Optimising retinal imaging tools

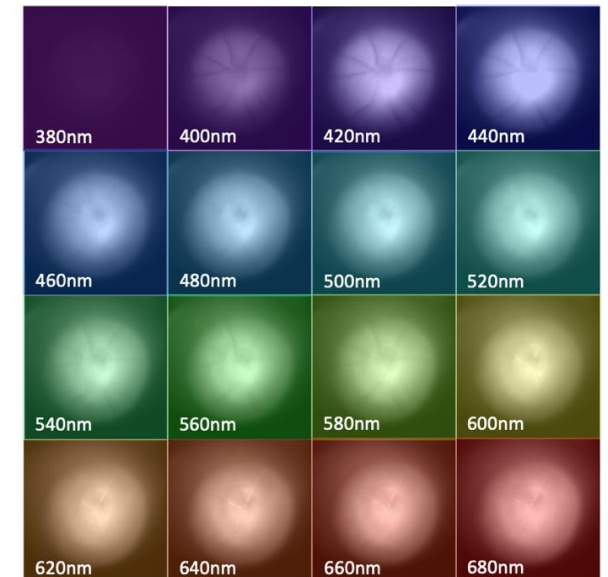
## Recent papers:

- Tran KKN, Wong VHY, Lim JKH, Shahandeh A, Hoang A, Finkelstein DI, Bui BV, Nguyen CT. Characterization of retinal function and structure in the MPTP murine model of Parkinson's disease. *Sci Rep* 2022;12:7610.
- Nguyen CT, Hui F, Charng J, Velaedan S, Van Koeverden A, Lim JK, He Z, Wong VHY, Vingrys AJ, Bui BV, Ivarsson M (2017). Retinal biomarkers provide “insight” into cortical pharmacology and disease. *Pharmacology and Therapeutics*. 175: 151-177.
- Lim JK, Li QX, He Z, Vingrys, AJ, Wong, VHY, Currier N. Mullen J, Bui BV, Nguyen, CT (2016). The Eye as a Biomarker for Alzheimer's Disease. *Front Neurosci* 10, 536.
- Hadoux X, Hui F, Lim JKH, Masters CL, Pebay A, Chevalier S, Ha J, Loi S, Fowler CJ, Rowe C, Villemagne VL, Taylor EN, Fluke C, Soucy JP, Lesage F, Sylvestre JP, Rosa-Neto P, Mathotaarachchi S, Gauthier S, Nasreddine ZS, Arbour JD, Rheaume MA, Beaulieu S, Dirani M, Nguyen CT, Bui BV, Williamson R, Crowston JG, van Wijngaarden P. (2019) Non-invasive in vivo hyperspectral imaging of the retina for potential biomarker use in Alzheimer's disease. *Nat Commun*;10:4227.

Email: [christine.nguyen@unimelb.edu.au](mailto:christine.nguyen@unimelb.edu.au)



Dr Christine Nguyen



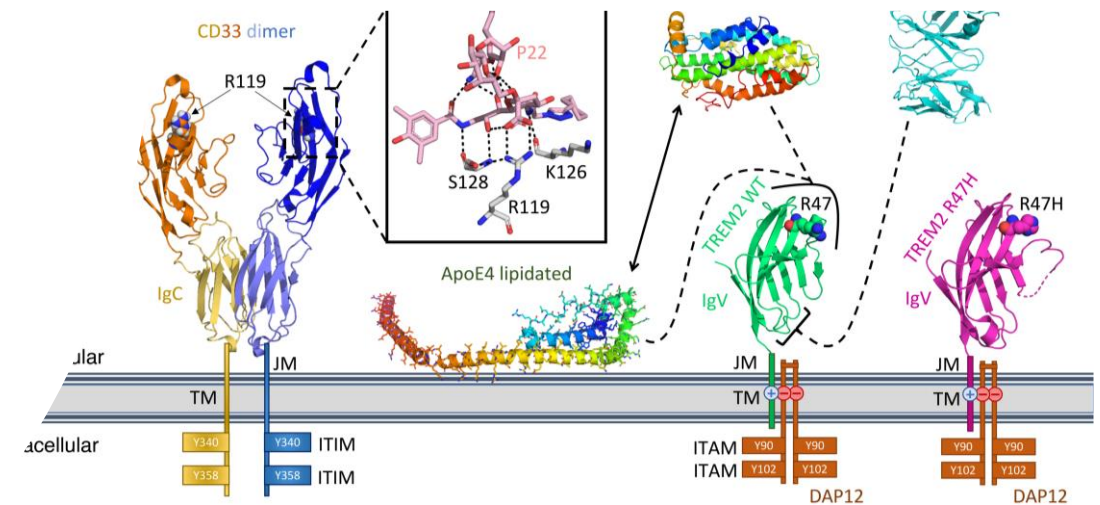
In vivo hyperspectral imaging in a live mouse eye

# Parker Laboratory – DBP, Bio21 Institute



Prof. Mike Parker

- Interests:
  - Structure-based drug discovery (crystallography, cryo-EM, computational biology, NMR)
  - Infection with a focus on pore-forming toxins
  - Neurodegenerative diseases, particularly Alzheimer's disease
  - Cancer with a focus on cell surface receptors
- Recent papers:
  - Drug Repurposing: misconceptions, challenges and opportunities facing academic researchers (2021) *Sci. Trans. Med.* **13**, eabd5542
  - Reaction hijacking of aminoacyl tRNA synthetases as a new anti-infectives strategy (2022) *Science* **376**, 1074-1079
- Email: [mwp@unimelb.edu.au](mailto:mwp@unimelb.edu.au)





# Pidot Laboratory – DMI, Doherty Institute

- Interests:

- Identifying new antibiotics to treat MDR bacterial pathogens
- Biosynthesis of natural products/secondary metabolites
- Genomics of bacterial secondary metabolism

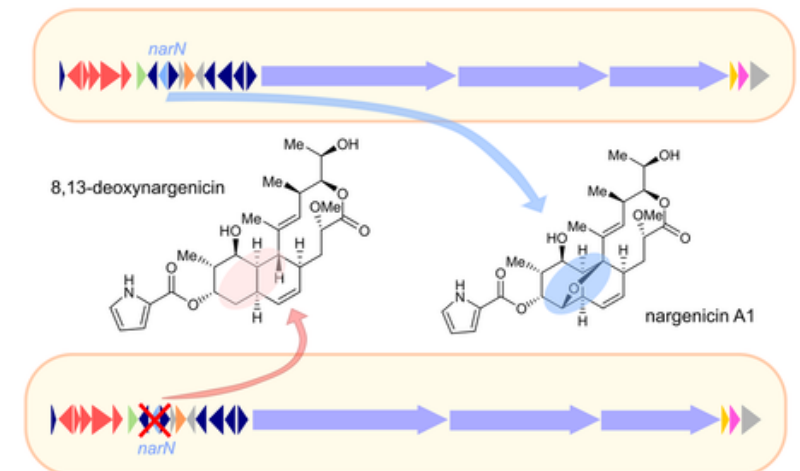
- Recent papers:

- Bacterial endosymbionts protect beneficial soil fungus from nematode attack. Büttner H, Niehs SP, et al. *Proc Natl Acad Sci USA*. 2021 doi: 10.1073/pnas.2110669118.
- Global analysis of biosynthetic gene clusters reveals conserved and unique natural products in entomopathogenic nematode-symbiotic bacteria. Shi YM, Hirschmann M, et al *Nat Chem*. 2022 doi: 10.1038/s41557-022-00923-2.

- Email: [sacha.pidot@unimelb.edu.au](mailto:sacha.pidot@unimelb.edu.au)



Dr. Sacha Pidot

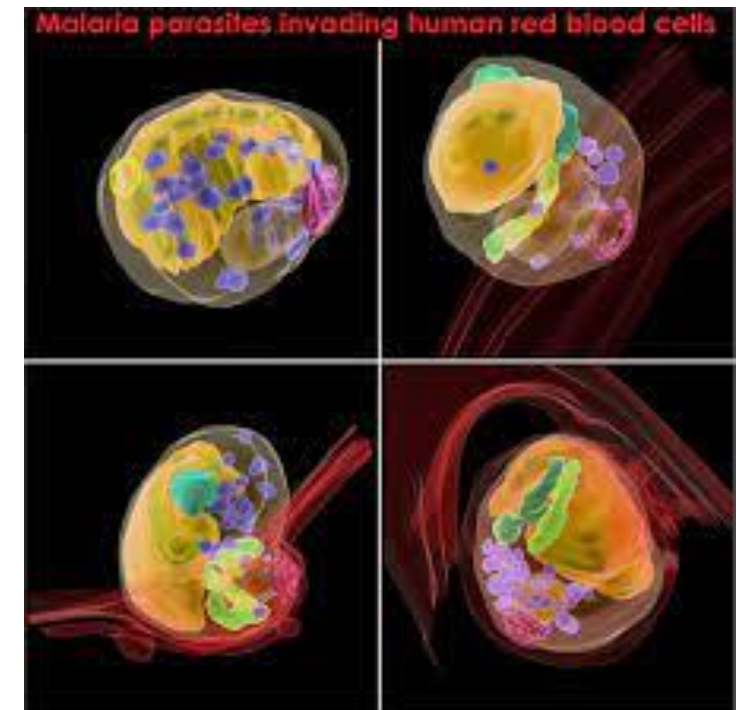


# Ralph Laboratory – DBP, Bio21 Institute



Prof. Stuart Ralph

- Interests:
  - Drug resistance in malaria, particularly *Plasmodium falciparum*
  - Gene regulation in malaria parasites
  - Bioinformatic analysis of the Plasmodium genome
- Recent papers:
  - Delayed death in the malaria parasite *Plasmodium falciparum* is caused by disruption of prenylation-dependent intracellular trafficking. Kennedy K, et al PLoS Biol. 2019 Jul 18;17(7):e3000376
  - Direct Nanopore Sequencing of mRNA Reveals Landscape of Transcript Isoforms in Apicomplexan Parasites. Lee VV, et al mSystems. 2021 Mar 9;6(2):e01081-20
  - Email: [saralph@unimelb.edu.au](mailto:saralph@unimelb.edu.au)



# Scott Laboratory – DMI, Doherty Institute

- Interests:

- Role of protein glycosylation in Gram negative pathogens, esp. *Acinetobacter*, *Burkholderia* and *Neisseria*
- Proteomic method development for systems biology
- Glycoengineering to develop new vaccine production platforms

- Recent papers:

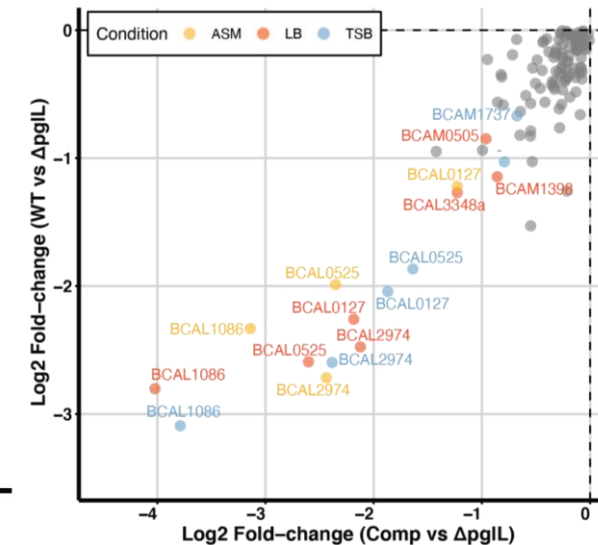
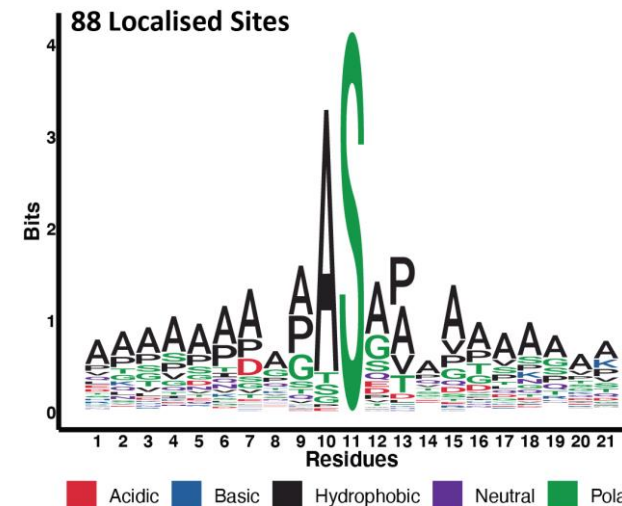
- Hayes, A.J., Lewis, J.M., Davies, M.R. et al. Burkholderia PglL enzymes are Serine preferring oligosaccharyltransferases which target conserved proteins across the Burkholderia genus. *Commun Biol* 4, 1045 (2021). <https://doi.org/10.1038/s42003-021-02588-y>.
- Hadjineophytou C, Anonsen JH, Svingerud T, et al. Sculpting the Bacterial O-Glycoproteome: Functional Analyses of Orthologous Oligosaccharyltransferases with Diverse Targeting Specificities. *mBio*. 2022 Jun 28;13(3):e0379721. ). <https://doi.org/10.1128/mbio.03797-21>
- Bagdonaite, I., Malaker, S.A., Polasky, D.A. et al. Glycoproteomics. *Nat Rev Methods Primers* 2, 48 (2022). <https://doi.org/10.1038/s43586-022-00128-4>.

- Email: [nichollas.scott@unimelb.edu.au](mailto:nichollas.scott@unimelb.edu.au)



Dr Nick Scott

## Glycoproteomics of microbial systems





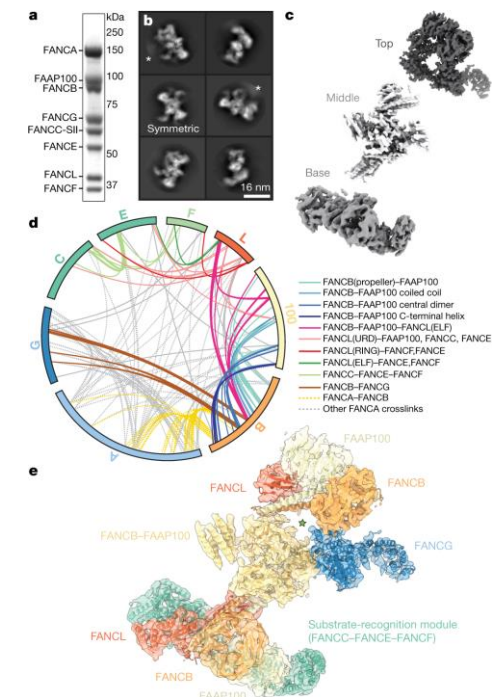
# Shakeel Laboratory – DBP and WEHI



Dr. Shabih Shakeel

- Interests:
  - Molecular basis of epigenetic silencing and activation.
  - Atomic-scale understanding of homologous recombination-mediated DNA repair.
  - Method development in cryo-electron microscopy.
- Recent papers:
  - The DNA-damage kinase ATR activates the FANCD2-FANCI clamp by priming it for ubiquitination. Siljacki T *et al.* Nature Structure & Molecular Biology *In press*.
  - FANCD2-FANCI is a clamp stabilized on DNA by monoubiquitination of FANCD2 during DNA repair. Alcón P\*, Shakeel S\* *et al.* Nature Structural and Molecular Biology 2020 27(3):240-248.
  - Structure of the Fanconi anaemia monoubiquitin ligase complex. Shakeel S\*, Rajendra E\* *et al.* Nature 2019 575:234–237

- Email: [shabih.s@unimelb.edu.au](mailto:shabih.s@unimelb.edu.au)  
[shakeel.s@wehi.edu.au](mailto:shakeel.s@wehi.edu.au)



# Stewart Laboratory in Mechanopharmacology – DBP

- Interests:

- **Inflammation and fibrosis mechanisms** using novel bioassays for drug discovery and characterization.
- Transforming drug screening technologies: **multiplexed flow system** to enable continuous dynamic composition of culture media ([ARC CPPT](#)).

- Recent papers:

- Comprehensive multiplexed superfusion system enables physiological emulation in cell culture: exemplification by persistent circadian entrainment. Gao X, Wu Y, Cheng T and Stewart AG (2022) *Lab Chip*,22:1137-1148.
- Editorial: Accelerated Translation Using Microphysiological Organoid and Microfluidic Chip Models. Benam KH, Burgess JK and Stewart AG (2022) *Front. Pharmacol.* 12:827172.

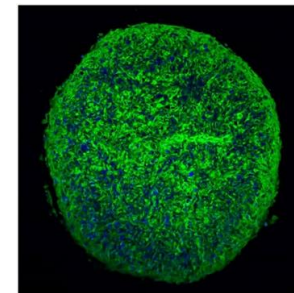
- Email: [astew@unimelb.edu.au](mailto:astew@unimelb.edu.au)



Prof Alastair Stewart

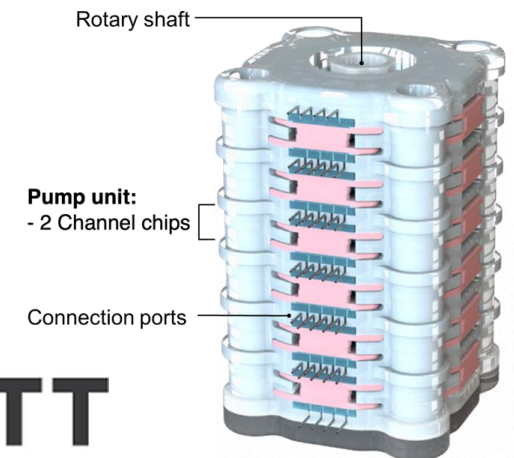


Dr Bryan Gao



Lung fibroblast spheroid grown from fibrotic tissue

**RPM<sup>2</sup>**  
Rotary Peristaltic  
Multiplexed Micropump



 **ARC  
CPTT**  
Centre for Personalised  
Therapeutics Technologies

# Strugnell Laboratory – DMI, Doherty Institute

- Interests:

- Pathogenesis of Gram negative pathogens, esp. *Salmonella* and *Klebsiella*
- Immunity in *Salmonella* infections
- Basic bacterial physiology to define new drug targets

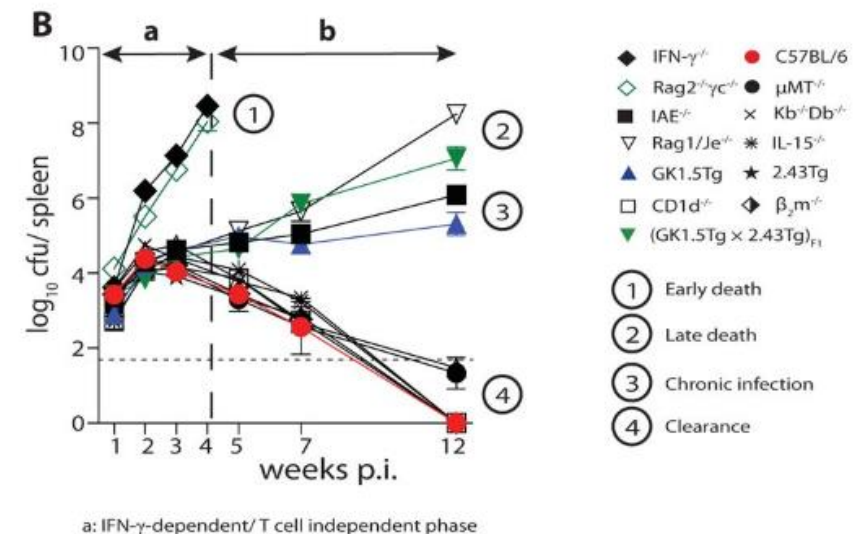
- Recent papers:

- LPS O Antigen Plays a Key Role in *Klebsiella pneumoniae* Capsule Retention. Singh S, Wilksch JJ, et al. *Microbiol Spectr*. 2022 doi: 10.1128/spectrum.01517-21.
- CD4+ T cell immunity to *Salmonella* is transient in the circulation. Peres NG, Wang N, et al. *PLoS Pathog* 2021 10.1371/journal.ppat.1010004.

- Email: [rastru@unimelb.edu.au](mailto:rastru@unimelb.edu.au)



Prof. Dick Strugnell



Responses of immunodeficient mice to *Salmonella* infections



# Theoretical Systems Biology – Melbourne

## Integrative Genomics

- Interests:
  - Cell fate decision making processes
  - Whole cell modelling
  - Synthetic biology
  - Stem cell differentiation and development

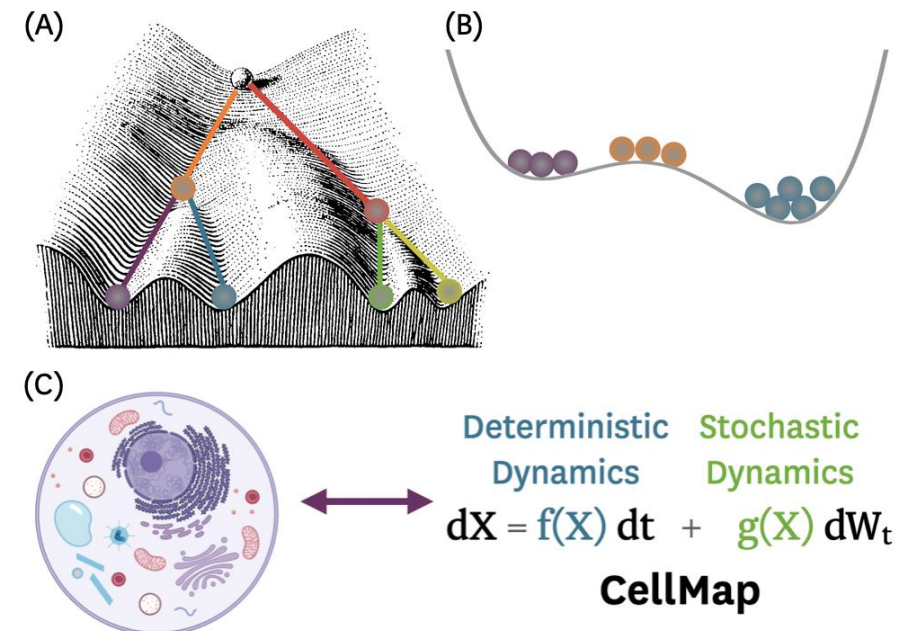
- Recent papers:

- Coomer, M. A., Ham, L. & Stumpf, M. P. H. Noise distorts the epigenetic landscape and shapes cell-fate decisions. *Cell Syst*, 1-20 (2022).
- Ham, L., Jackson, M. & Stumpf, M. P. Pathway dynamics can delineate the sources of transcriptional noise in gene expression. *eLife* **10**, e69324 (2021).
- Stadler, T., Pybus, O. G. & Stumpf, M. P. H. Phylodynamics for cell biologists. *Science* **371**, eaah6266 (2021).

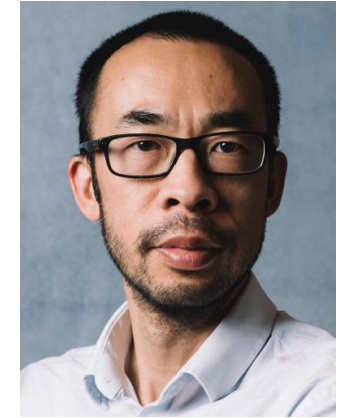
- Email: [mstumpf@unimelb.edu.au](mailto:mstumpf@unimelb.edu.au)



Prof. Michael P.H. Stumpf

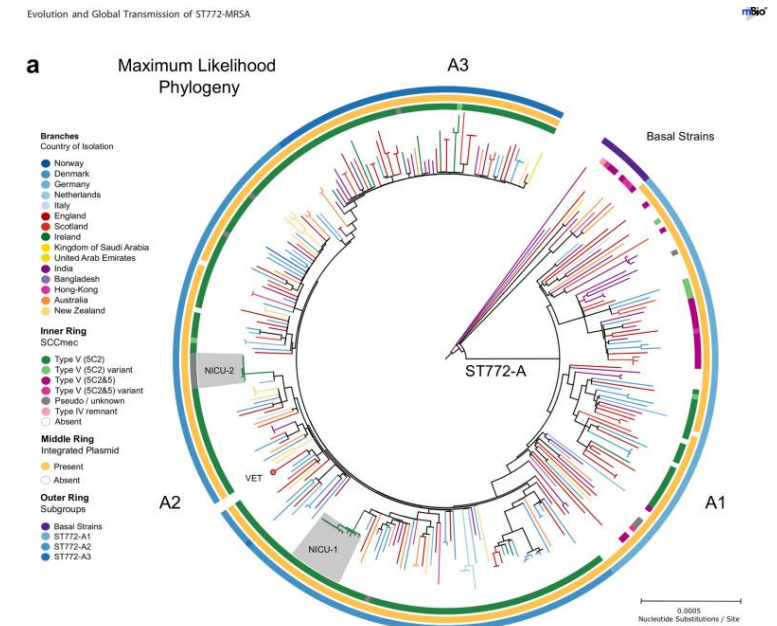


# Tong group – DID, Doherty Institute



Prof. Steven Tong

- Interests:
  - Clinical disease due to *Staphylococcus aureus*
  - Pragmatic randomized clinical trials
  - Linking genotype, phenotype and clinical outcomes for *S. aureus*
- Recent papers:
  - Effect of Vancomycin or Daptomycin With vs Without an Antistaphylococcal  $\beta$ -Lactam on Mortality, Bacteremia, Relapse, or Treatment Failure in Patients With MRSA Bacteremia: A Randomized Clinical Trial. Tong S, et al. *JAMA*. 2020  
<https://jamanetwork.com/journals/jama/fullarticle/2760737>
  - Evolution and Global Transmission of a Multidrug-Resistant, Community-Associated Methicillin-Resistant *Staphylococcus aureus* Lineage from the Indian Subcontinent. Steinig, et al. *mBio* 2019  
<https://journals.asm.org/doi/10.1128/mBio.01105-19>
- Email: [steven.tong@unimelb.edu.au](mailto:steven.tong@unimelb.edu.au); @syctong



*S. aureus* ST772 from Indian subcontinent

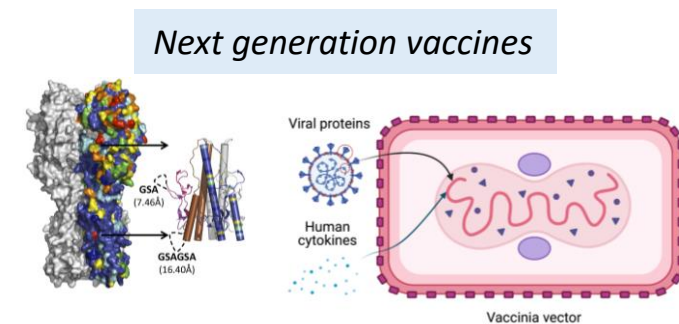
# Valkenburg Laboratory – DMI, Doherty Institute

- Interests:
  - Viral immunity: Influenza A virus and SARS-CoV-2
  - Human clinical trials and observational studies
  - Antibody function and T cells
- Recent papers:
  - The SARS-CoV-2 antibody landscape is lower in magnitude for structural proteins, diversified for accessory proteins and stable long-term in children. Hachim A et al. *Nature Comms*. 2022 PMID: 35618731
  - Next-generation T cell-activating vaccination increases influenza virus mutation prevalence . Bull M et al. *Sci Adv* 2022 PMID: 35385318
- Email: [sophie.v@unimelb.edu.au](mailto:sophie.v@unimelb.edu.au)



Assoc Prof. Sophie Valkenburg

Patients and current vaccines



# Villadangos Laboratory – DMI, DBP, Bio21

## Interests

- MR1: metabolite presentation
- Receptor Ubiquitination
- O-GlcNAcylation
- Cancer Immunotherapy
- Dendritic Cell biology
- Immune Regulation
- Multi-disciplinarity: - the key to understanding and harnessing the immune system



Prof Jose Villadangos

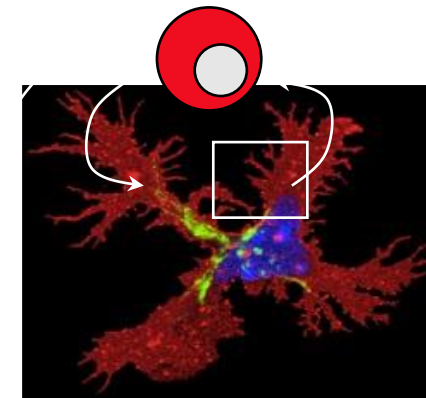
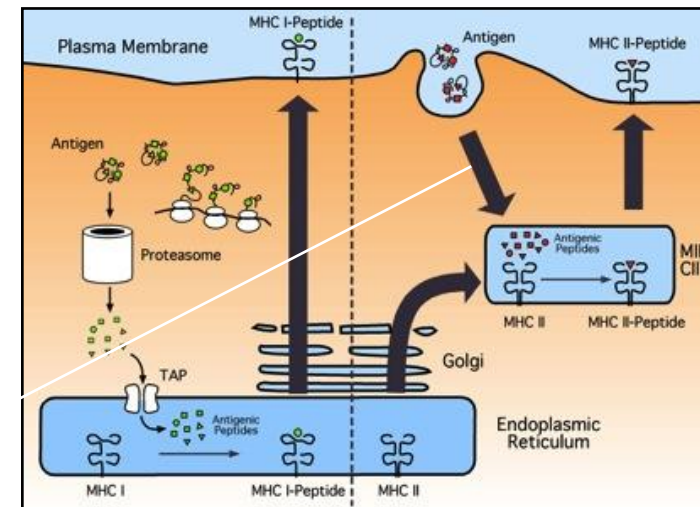
## Recent Papers

Roquilly, A., Mintern, J. D., & Villadangos, J. A. (2022). Spatiotemporal Adaptations of Macrophage and Dendritic Cell Development and Function. *Annual review of immunology*, 40, 525–557.

<https://doi.org/10.1146/annurev-immunol-101320-031931>

McWilliam, H. E., & Villadangos, J. A. (2020). MR1: a multi-faceted metabolite sensor for T cell activation. *Current opinion in immunology*, 64, 124–129. <https://doi.org/10.1016/j.coi.2020.05.006>

- [j.villadangos@unimelb.edu.au](mailto:j.villadangos@unimelb.edu.au)





# Visual & Cognitive Neuroscience Laboratory, Department of Optometry & Vision Sciences and Florey Department of Neuroscience & Mental Health

## Interests:

- Neural mechanisms of top-down attention and predictive coding
- Functional microcircuitry of the visual cortex
- Visual attention, reading and dyslexia.

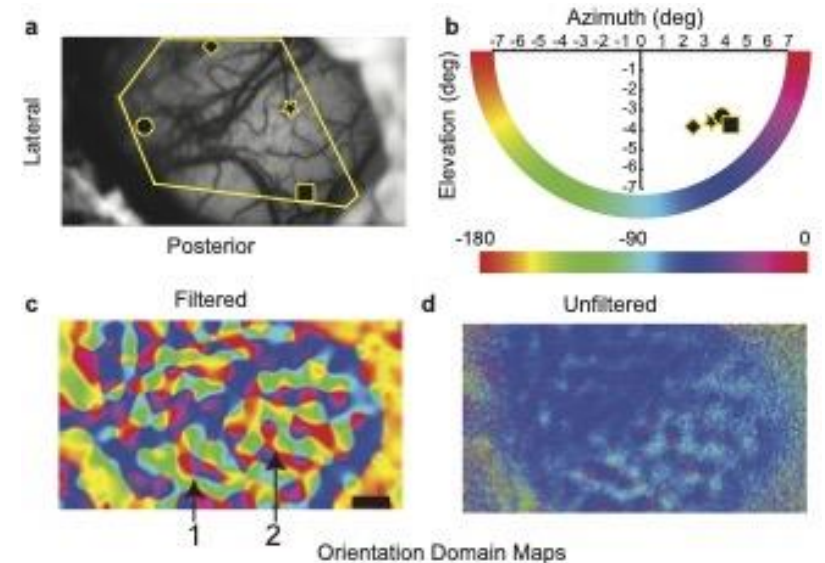
## Recent papers:

- Levichkina E, Kermani M, Saalman YB, Vidyasagar TR (2021) Dynamics of coherent activity between cortical areas defines a two-stage process of top-down attention. *Exp Brain Res.*, 239, 2767-2779.
- Nguyen BN, Kolbe SC, Verghese A, Nearchou C, McKendrick AM, Egan GF, Vidyasagar TR (2021) Visual search efficiency and functional visual cortical size in children with and without dyslexia. *Neuropsychologia*, 155, 178819.
- Esghaei M, Treue S, Vidyasagar TR (2022) Dynamic coupling of oscillatory neural activity and its roles in visual attention. *Trends in Neurosci.*, 45(4):323-335.
- Mohan YS, Jayakumar J, Lloyd EKJ, Levichkina E & Vidyasagar TR (2019). Diversity of feature selectivity in macaque visual cortex arising from limited number of broadly-tuned input channels, *Cerebral Cortex*, 29, 5255-5268.

Email: [trv@unimelb.edu.au](mailto:trv@unimelb.edu.au)



Prof. Trichur Vidyasagar



Distribution of preferred orientations in filtered and unfiltered optical imaging maps (From Mohan et al., 2019)

# Wakim Laboratory – DMI, Doherty Institute

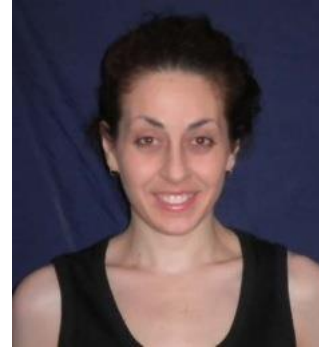
- Interests:

- Immunity to Influenza A virus
- Influenza A virus vaccine development
- Mucosal immunology – harnessing immune cells in the upper respiratory tract to protect against respiratory infections (viral and bacterial pneumonia)

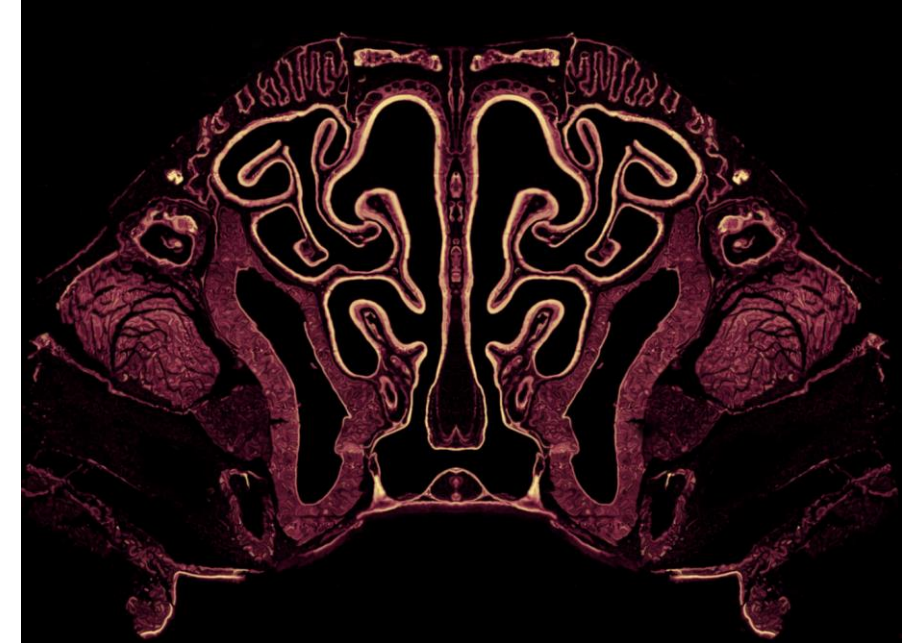
- Recent papers:

- Braverman, J., et al., *Staphylococcus aureus* specific lung resident memory CD4(+) Th1 cells attenuate the severity of influenza virus induced secondary bacterial pneumonia. *Mucosal Immunol*, 2022. **15**(4): p. 783-796.
- Bedford, J.G., et al., *Unresponsiveness to inhaled antigen is governed by conventional dendritic cells and overridden during infection by monocytes*. *Sci Immunol*, 2020. **5**(52).
- Pizzolla, A., et al., *Influenza-specific lung-resident memory T cells are proliferative and polyfunctional and maintain diverse TCR profiles*. *J Clin Invest*, 2018. **128**(2): p. 721-733.

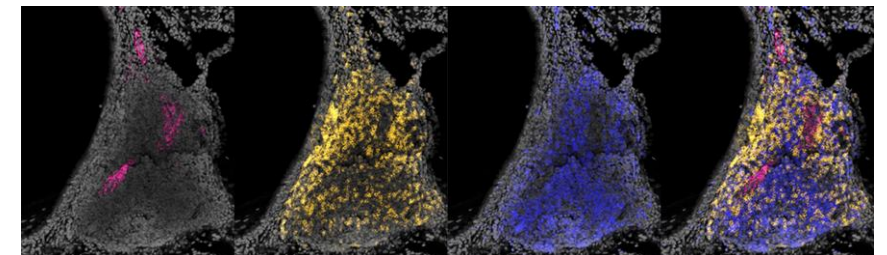
- Email: [wakiml@unimelb.edu.au](mailto:wakiml@unimelb.edu.au)



Assoc. Prof.  
Linda Wakim



Cross section through murine nasal tissue



Lymphoid tissue that services the upper respiratory tract



# Genetic Engineering Research Unit, Centre for Eye Research Australia

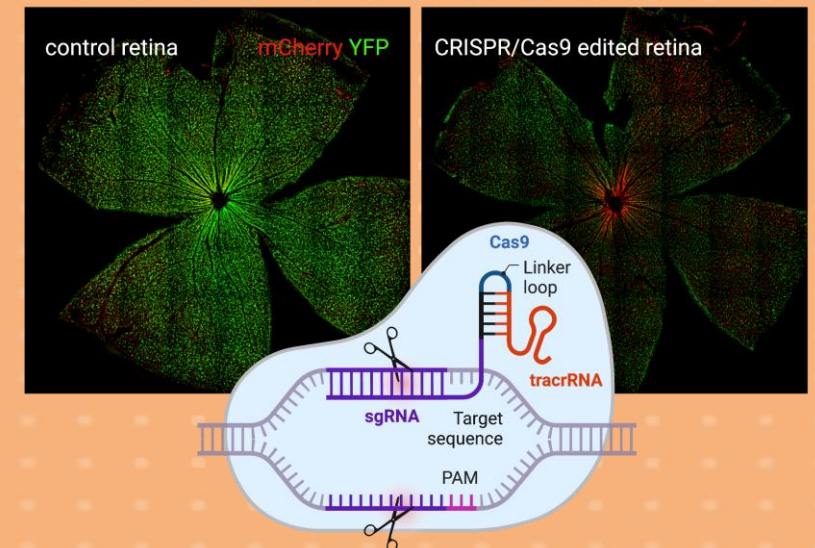
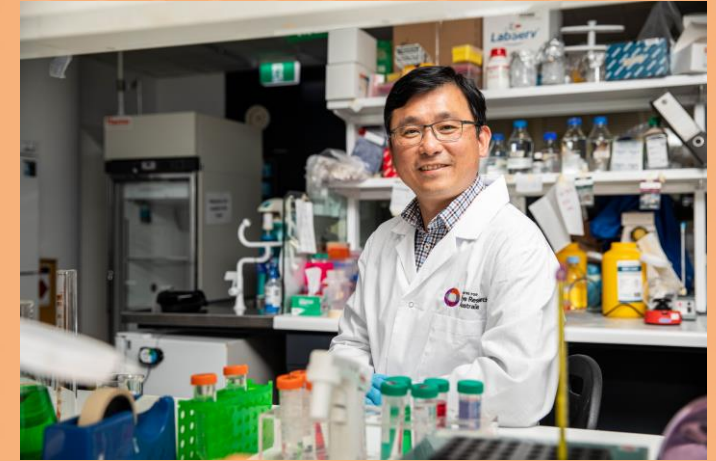
**Head: Associate Professor Guei-Sheung Liu**

**Interests:**

- CRISPR/Cas-mediated ophthalmic gene editing
- Novel gene therapy to prevent neovascular blindness
- Design of barrier-breaking eye drops using nanoformulation

**Recent papers:**

- Kumar S, Fry LE, Wang JH, Martin KR, Hewitt AW, Chen FK, Liu GS. RNA-targeting strategies as a platform for ocular gene therapy (2022). *Prog Retin Eye Res.* 2022 Jul 12:101110. Online ahead of print.
- Wang JH, Tseng CL, Lin FL, Chen J, Hsieh EH, Lama S, Chuang YF, Kumar S, Zhu L, McGuinness MB, Hernandez J, Tu L, Wang PY, and Liu GS. Topical application of TAK1 inhibitor encapsulated by gelatin particle alleviates corneal neovascularization (2022). *Theranostics.* 12(2):657-674. [Journal Cover].
- Chen J, Lin FL, Leung JYK, Tu L, Wang JH, Chuang YF, Li F, Shen HH, Disting GJ, Wong VHY, Lisowski L, Hewitt AW, Bui BV, Zhong J, and Liu GS. A drug-tunable Flt23k gene therapy for controlled intervention in retinal neovascularization (2021). *Angiogenesis.* 24(1):97-110.
- Hung S, Chrysostomou V, Li F, Lim J, Wang JH, Powell J, Tu L, Daniszewski M, Lo C, Wong R, Crowston JG, Pébay A, King AE, Bui BV, and Liu GS<sup>^</sup>, and Hewitt AW<sup>^</sup>. AAV-mediated CRISPR/Cas gene editing of retinal cells in vivo (2016). *Invest Ophthalmol Vis Sci.* 57(7):3470-3476.



CRISPR/Cas-mediated gene editing of retinal cells in vivo. (From Hung et al., 2016)

**Email: [gslu@unimelb.edu.au](mailto:gslu@unimelb.edu.au)**

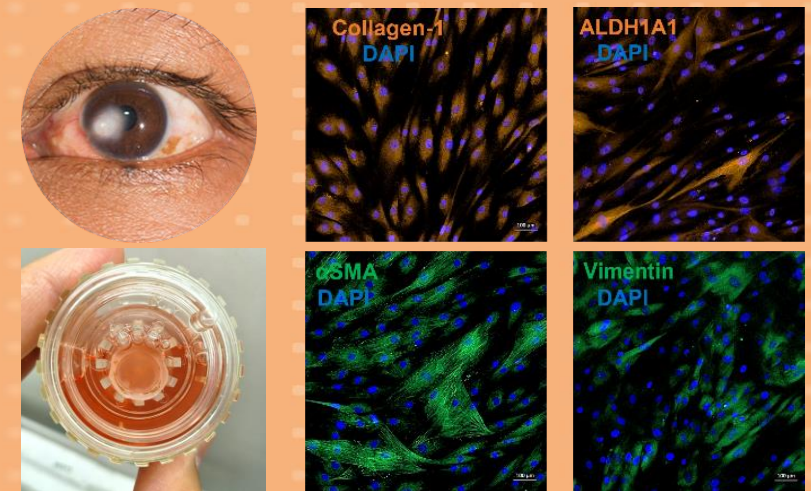
## CI: Prof Mark Daniell and Dr Gink Yang

### • Interests:

- Corneal transplantation and adult stem cell biology.
- Mechanisms underlying corneal wound repair and scarring.
- Ocular drug validation and development .

### • Recent papers:

- Seth I, Bulloch G, Vine G, Outmezguine J, Seth N, Every J and Daniell M (2022) The association between keratoconus and allergic eye diseases: A systematic review and meta-analysis. *Clinical & Experimental Ophthalmology*, 50 (3), 280-293
- Roberts PK, Keane M, Yang GN, Chan E, Harkin DG, McKirdy N, Daniell M (2022) A comparison of penetrating and endothelial keratoplasty in patients with iridocorneal endothelial syndrome: a registry study. *Cornea*, manuscript under review.
- Yang GN, Parinaz A, Strudwick LX, Bonder C, Kopecki Z and Cowin AJ (2021) Overexpression of Flii during murine embryonic development increases symmetrical division of epidermal progenitor cells” *International Journal of Molecular Biology*, 22(15):8235.
- Yang GN, Strudwick LX, Bonder C, Kopecki Z and Cowin AJ (2020) Effect of Flightless I on Epidermal stem cell niche during wound healing. *Advances in Wound Repair*, 9(4):161-173.
- **Email: [gyang@cera.org.au](mailto:gyang@cera.org.au)**



Corneal scarring (and its underlying mechanisms) is a major cause for corneal transplantation