

## Pete A Williams, PhD

*Dept. of Clinical Neuroscience, Division of Eye and Vision  
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### Current Appointments

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- 2018-Present *Dept. of Clinical Neuroscience, Division of Eye and Vision, Karolinska Institutet*  
**Assistant Professor in Medical Sciences**  
**Research Group Leader - Glaucoma**
- 2019-Present *S:t Eriks Ögonsjukhus*  
**Research Group Leader**

### Other Appointments

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- 2021-Present *Duke-NUS, Singapore*  
**Distinguished Visiting Scholar**
- 2019-Present *School of Optometry and Vision Sciences, Cardiff University, U.K.*  
**Honorary Research Fellow**

### Career History

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- 2012-2018 *The Jackson Laboratory, Bar Harbor, ME, U.S.A.*  
**Postdoctoral Fellow (HHMI Simon John Lab)**
- 2011 *The Jackson Laboratory, Bar Harbor, ME, U.S.A.*  
**Collaborative Researcher**
- 2009 *School of Optometry and Vision Sciences; Cardiff University, Cardiff, U.K.*  
**Summer Research Student**

### Teaching Experience

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- 2019-Present *Dept. of Clinical Neuroscience, Division of Eye and Vision, Karolinska Institutet*  
**Anatomy, Physiology, and Disease 2**
- 2019-Present *Dept. of Clinical Neuroscience, Division of Eye and Vision, Karolinska Institutet*  
**Magisterprogrammet i klinisk optometri (Neurooptometri)**
- 2016 *The Jackson Laboratory, Bar Harbor, ME, U.S.A.*  
**Online Education Consultant**
- 2015-2016 *The Jackson Laboratory, Bar Harbor, ME, U.S.A.*  
**Teacher, Mentor**  
JAX SSP (The Jackson Laboratory Summer Student Program)
- 2015 *College of the Atlantic, Bar Harbor, ME, U.S.A.*  
**Lecturer**  
Topics in Biomedical Research lecture series
- 2009-2012 *School of Optometry and Vision Sciences, Cardiff University, U.K.*  
**Postgraduate Demonstrator and Teacher**  
Blood physiology, tonometry, primate retina anatomy, and human neuroanatomy

### Education

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- 2012 *School of Optometry and Vision Sciences, Cardiff University, Cardiff, U.K.*  
**PhD in Vision Science (Visual Neuroscience and Molecular Biology)**  
Supervisors: Prof. M Votruba and Prof. JE Morgan
- 2009 *School of Biosciences; Cardiff University, Cardiff, U.K.*  
**BSc. (Hons) Biomedical Sciences – Neuroscience**

## Professional Training

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| 2021 | Teaching in the Glocal University, Karolinska Institutet                |
| 2020 | Teaching and Learning in Higher Education (GHPD), Karolinska Institutet |
| 2020 | Pedagogy for Doctoral Supervisors, Karolinska Institutet                |
| 2019 | Doctoral Supervision Course, Karolinska Institutet                      |
| 2015 | Software Carpentry: R for Data Analysis, The Jackson Laboratory         |
| 2012 | Applied Bioinformatics, Mount Desert Island Biological Laboratory       |

## Funding as Lead Applicant

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|------|---|
| 2020 | KI Foundation Grant for Eye Research (2021; 110,000 SEK)                            |
| 2020 | Stiftelsen Kronprinsessan Margaretas Arbetsnämnd för synskadade (2021; 100,000 SEK) |
| 2020 | KI Research Foundation Grants (2021-2022; 96,300 SEK)                               |
| 2020 | STINT Initiation Grant (2021-2022; 150,000 SEK + 345,000 SEK matched funding)       |
| 2020 | Ögonfonden (Glaukomförbundet) (2020-2021; 200,000 SEK)                              |
| 2019 | KI Foundation Grant for Eye Research (2020; 122,000 SEK)                            |
| 2019 | Åke Wilberg Stiftelse (2020; 200,000 SEK)   |
| 2019 | Stiftelsen Kronprinsessan Margaretas Arbetsnämnd för synskadade (2020; 180,000 SEK) |
| 2019 | Ögonfonden (Glaukomförbundet) (2019-2020; 100,000 SEK)                              |
| 2019 | Glaucoma Research Foundation Shaffer Grant (2019-2020; 50,000 USD)                  |
| 2018 | KI Foundation Grant for Eye Research (2019; 106,000 SEK)                            |
| 2018 | Stiftelsen Lars Hiertas Minne (2019-2020; 40,000 SEK)                               |
| 2018 | Stiftelsen Kronprinsessan Margaretas Arbetsnämnd för synskadade (2019; 90,000 SEK)  |
| 2018 | Vetenskapsrådet Medicine and Health Starting Grant (2019-2022; 6,000,000 SEK)       |
| 2018 | KI Research Foundation Grants (2019-2020; 215,800 SEK)                              |
| 2018 | StratNeuro Start-up Programme (2018-2020; 1,000,000 SEK)                            |
| 2017 | Faculty Funded Career Position, Karolinska Institutet (2018-2021; 4,750,000 SEK)    |
| 2013 | TJL Fellowship Grant (2 years full salary funding)                                  |

## Funding as Co-Applicant

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|------|---|
| 2020 | Centrala ALF-projektmedel (2021-2023; 1,500,000 SEK, lead applicant G Jóhannesson [Umeå Universitet])                                   |
| 2020 | Stiftelsen Kronprinsessan Margaretas Arbetsnämnd för synskadade (2021; 90,000 SEK, lead applicant G Jóhannesson [Umeå Universitet])     |
| 2020 | Cronqvists Stiftelse (2020-2021; 290,000 SEK, lead applicant G Jóhannesson [Umeå Universitet])  |
| 2019 | RPB International Research Collaborators Award (2020; 75,000 USD with B Jones [U Utah])   |
| 2019 | Vetenskapsrådet Research Project Grant Clinical Therapy Research (2020; 1,084,500 SEK, lead applicant G Jóhannesson [Umeå Universitet]) |
| 2019 | Fight For Sight UK (2019-2022; 98,335 GBP, PhD Studentship with J Morgan, M Votruba [Cardiff University])                               |

## Awards

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| 2021 | 2021 Shaffer Prize   |
| 2019 | Swedish Ophthalmologic Society Most Promising Researcher 2020 / SOE-lecturer 2020                          |
| 2019 | Excellence in Neuroscience Research award (Karolinska Institutet)  |
| 2013 | The Barbara and Joseph Cohen Young Investigator Award  |
| 2011 | European Association for Vision and Eye Research Travel Grant Winner for Best Paper in Category (Genetics) |

## Professional and Academic Service

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Editorial Board Member: *Frontiers in Neurology, Frontiers in Neuroscience, Frontiers in Psychiatry, Translational Vision Science & Technology*

Reviewer: *BMC Ophthalmology, British Journal of Ophthalmology, Experimental Eye Research, The FASEB Journal, International Journal of Tryptophan Research, Investigative Ophthalmology & Visual Science, Journal of Glaucoma, Journal of Molecular Biology, Journal of Neurochemistry, Journal of Neuroinflammation, Journal of Open Research Software, Molecular Neurodegeneration, Molecular Pharmaceutics, Molecular Vision, Oxidative Medicine and Cellular Longevity, Rejuvenation Research, Science Advances*

Grant reviewer: *Fight For Sight UK, Moorfields Eye Charity, The Ophthalmic Research Institute of Australia (ORIA)*

### Session chair:

2019 Optic Nerve Meeting – Bioenergetics and Neuro-Glial Interactions, Obergurgl, Austria  
2018 Optic Nerve Meeting – Bioenergetics, Obergurgl, Austria  
2017 Optic Nerve Meeting – Bioenergetics, Obergurgl, Austria  
2016 Optic Nerve Meeting – Neuroinflammation and Glia, Obergurgl, Austria

### Session scribe:

2015 Lasker/IRRF Initiative on Astrocytes and Glaucomatous Neurodegeneration

### Academic service:

2019-Present FoUU-kommittén S:t Eriks Ögonsjukhus (Research, Development, and Education committee)  
2016-2017 Co-chair - The Jackson Laboratory Postdoctoral Association (JPA)  
2006-2009 STEMNET Ambassador for Cardiff University  
2007-2008 Student Representative for Neuroscience and Pharmacology  
2006-2008 Student Chairman of Biological Sciences  
2006-2007 Student Representative for Neuroscience  
2006-2007 Vice President – Cardiff University Neuroscience Society  
2006-2007 Student and Residential Representative

### Formal mentorship programs:

2019-2020 Karolinska Institutet Junior Faculty Mentorship Program (mentee)  
2014-2016 JAX SSP (The Jackson Laboratory Summer Student Program) (mentor)

## Publications

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### Preprints

- Tribble JR, Otmani A, Sun S, Ellis S, Cimaglia G, Vohra R, Jöe M, Lardner E, Venkataraman AP, Domínguez-Vicent A, Kokkali E, Rho S, G Jóhannesson, Burgess RW, Fuerst PG, Brautaset R, Kolko M, Morgan JE, Crowston JG, Votruba M, **Williams PA**. “Nicotinamide provides neuroprotection in glaucoma by protecting against mitochondrial and metabolic dysfunction”. *bioRxiv*. 2020 (doi: 10.1101/2020.10.21.348250),
- Yousefi S, Chen H, Ingels JF, McCarty MS, Centeno AG, Chintalapudi S, Mulligan MK, **Williams PA**, John SWM, Jones BW, Jablonski MM, Hollingsworth TJ, Geisert EE, Lu L, Williams RW. “Computational approaches towards reducing contamination in single-cell RNA-seq data”. *bioRxiv*. 2020 (doi: 10.1101/2020.07.15.205062).

### 2021

- Tribble JR, Hui F, Jöe M, Bell K, Chrysostomou V, Crowston JG, **Williams PA**. “Targeting diet and exercise for neuroprotection and neurorecovery in glaucoma”. *Cells*. 2021 (doi: 10.3390/cells10020295),
- Tribble JR\*, Kokkali E\*, Otmani A, Plastino F, Lardner E, Vohra R, Kolko M, Andre H, Morgan JE, **Williams PA**. “When is a control not a control? Reactive microglia occur throughout the control contralateral pathway of retinal ganglion cell projections in experimental glaucoma”. *Translational Vision Science & Technology*. 2021 (doi: 10.1167/tvst.10.1.22), \* co-first author,
- Tribble JR, Otmani A, Kokkali E, Lardner E, Morgan JE, **Williams PA**. “Retinal ganglion cell degeneration in a rat magnetic bead model of ocular hypertensive glaucoma”. *Translational Vision Science & Technology*. 2021 (doi: 10.1167/tvst.10.1.21).

### 2020

- Harder JM, Guymer C, Wood JPM, Daskalakis E, Chidlow G, Zhang C, Balasubramanian R, Cardozo BH, Foxworth NE, Deering KE, Ouellette TB, Montgomery C, Wheelock CE, Casson RJ, **Williams PA**<sup>†</sup>, John SWM<sup>†</sup>. “Disturbed glucose and pyruvate metabolism in glaucoma with neuroprotection by pyruvate or rapamycin”. *PNAS*. 2020 (doi: 10.1073/pnas.2014213117), <sup>†</sup> corresponding authors,
- Bevan RJ, Hughes TR, **Williams PA**, Good MA, Morgan BP, Morgan JE. “Retinal ganglion cell degeneration correlates with hippocampal spine loss in experimental Alzheimer’s disease”. *Acta Neuropathologica Communications*. 2020 (doi: 10.1186/s40478-020-01094-2),
- Harder JM, **Williams PA**, Braine CE, Yang H, Thomas J, Foxworth NE, John SWM, Howell GR. “Anaphylatoxin receptor C3AR1 promotes optic nerve degeneration in DBA/2J mice”. *Journal of Neuroinflammation*. 2020 (doi: 10.1186/s12974-020-02011-z),
- Petrova V, Pearson CS, Ching J, Tribble JR, Solano AG, Yang Y, Love FM, Watt RJ, Osborne A, Reid E, **Williams PA**, Martin KR, Geller HM, Eva R, Fawcett JW. “Protrudin functions from the endoplasmic reticulum to support axon regeneration in the adult CNS”. *Nature Communications*. 2020 (doi: 10.1038/s41467-020-19436-y),
- Cimaglia G, Votruba M, Morgan JE, André H, **Williams PA**. “Potential therapeutic benefit of NAD<sup>+</sup> supplementation for glaucoma and age-related macular degeneration”. *Nutrients*. 2020 (doi: 10.3390/nu12092871),
- Casson RJ, Chidlow G, Crowston JG, **Williams PA**, Wood JPM. “Retinal energy metabolism in health and glaucoma”. *Progress in Retinal and Eye Research*. 2020 (doi: 10.1016/j.preteyeres.2020.100881),
- Bevan RJ, **Williams PA**, Waters CT, Thirgood R, Mui A, Seto S, Good MA, Morgan JE, Votruba M, Erchova I. “OPA1 deficiency accelerates hippocampal synaptic remodelling and age-related deficits in learning and memory”. *Brain Communications*. 2020 (doi: 10.1093/braincomms/fcaa101),
- Hui F, Tang J, **Williams PA**, McGuinness MB, Hadoux X, Casson RJ, Coote M, Trounce IA, Martin KR, van Wijngaarden P, Crowston JG. “Improvement in inner retinal function in glaucoma in response to nicotinamide (vitamin B<sub>3</sub>) supplementation: A crossover randomized clinical trial”. *Clinical & Experimental Ophthalmology*. 2020 (doi: 10.1111/ceo.13818),
- Tribble JR\*, Harder JM\*, **Williams PA**<sup>†</sup>, John SWM<sup>†</sup>. “Ocular hypertension suppresses homeostatic gene expression in optic nerve head microglia of DBA/2 J mice”. *Molecular Brain*. 2020 (doi: 10.1101/856427), \* co-first author. <sup>†</sup> corresponding authors.

### 2019

- Tribble JR, Vasalaukaite A, Redmond T, Young RD, Hassan S, Fautsch MP, Sengpiel F, **Williams PA**, Morgan JE. “Midget retinal ganglion cell dendritic and mitochondrial degeneration is an early feature of human glaucoma”. *Brain Communications*. 2019 (doi: 10.1093/braincomms/fcz035),
- **Williams PA**, Crowston JG. “Targeting metabolic vulnerabilities for neuroprotection in glaucoma: B<sub>3</sub> or not B<sub>3</sub>? That is the question”. *Glaucoma Today*. 2019 (<http://glaucomatoday.com/2019/10/targeting-metabolic-vulnerabilities-for-neuroprotection-in-glaucoma/>),

- **Williams PA**, Braine CE, Kizhatil K, Foxworth NE, Tolman NG, Harder JM, Scott RA, Sousa GL, Panitch A, Howell GR, John SWM. “Inhibition of monocyte-like cell extravasation protects from neurodegeneration in DBA/2J glaucoma”. *Molecular Neurodegeneration*. 2019 (doi: 10.1186/s13024-018-0303-3).

## 2018

- Tribble JR, **Williams PA**, Caterson B, Sengpiel F, Morgan JE. “Digestion of the glycosaminoglycan extracellular matrix by chondroitinase ABC supports retinal ganglion cell dendritic preservation in a rodent model of experimental glaucoma”. *Molecular Brain*. 2018 (doi: 10.1186/s13041-018-0412-5),
- Harder JM, **Williams PA**, Soto I, Foxworth NE, Fernandes KA, Freeburg NF, Howell GR, Libby R, John SWM. “*Jnk2* deficiency increases the rate of glaucomatous neurodegeneration in ocular hypertensive DBA/2J mice”. *Cell Death & Disease*. 2018 (doi: 10.1038/s41419-018-0705-8),
- Choquet H, Paylakhi S, Kneeland SC, Thai KK, Hoffmann TJ, Yin J, Kvale MN, Banda Y, Tolman NG, **Williams PA**, Schaefer C, Melles R, Risch N, John SWM, Nair KS, Jorgenson E. “A multiethnic genome-wide association study of primary open-angle glaucoma identifies novel risk loci”. *Nature Communications*. 2018 (doi: 10.1038/s41467-018-04555-4),
- **Williams PA**, Harder JM, Cardozo BH, Foxworth NE, John SWM. “Nicotinamide treatment robustly protects from inherited mouse glaucoma”. *Communicative & Integrative Biology*. 2018 (doi: 10.1080/19420889.2017.1356956).

## 2017

- **Williams PA**, Harder JM, John SWM. “Glaucoma as a metabolic optic neuropathy: making the case for nicotinamide treatment in glaucoma”. *Journal of Glaucoma*. 2017 (doi: 10.1097/IJG.0000000000000767),
- **Williams PA**, John SWM. “Glaucoma dialogue – 71509. Vitamin B<sub>3</sub> modulates mitochondrial vulnerability and prevents glaucoma in aged mice”. *International Glaucoma Review*. 2017 (<http://www.e-igr.com/GD/index.php?issue=183>),
- **Williams PA**, Braine CE, Foxworth NE, Cochran KE, John SWM. “GlyCAM1 negatively modulates monocyte entry into the optic nerve head and contributes to radiation-based protection in glaucoma”. *Journal of Neuroinflammation*. 2017 (doi: 10.1186/s12974-017-0868-8),
- Harder JM, Braine CE, **Williams PA**, Zhu X, MacNicol KH, Sousa GL, Buchanan RA, Smith RS, Libby RT, Howell GR, John SWM. “Early immune responses are independent of RGC dysfunction in glaucoma with complement component C3 being protective”. *PNAS*. 2017 (doi: 10.1073/pnas.1608769114),
- **Williams PA**, Harder JM, Foxworth NE, Cardozo BH, John SWM. “Nicotinamide and WLD<sup>S</sup> act together to prevent neurodegeneration in glaucoma”. *Frontiers in Neuroscience*. 2017 (doi: 10.3389/fnins.2017.00232),
- **Williams PA**, Harder JM, Foxworth NE, Cochran KE, Philip VM, Porciatti V, Smithies O, John SWM. “Vitamin B<sub>3</sub> modulates mitochondrial vulnerability and prevents glaucoma in aged mice”. *Science*. 2017 (doi: 10.1126/science.aal0092),
- **Williams PA**, Marsh-Armstrong N, Howell GR. “Neuroinflammation in glaucoma: A new opportunity”. *Experimental Eye Research*. 2017 (doi: 10.1016/j.exer.2017.02.014).

## 2016

- **Williams PA\***, Tribble JR\*, Pepper KW, Cross SD, Morgan BP, Morgan JE, John SWM, Howell GR. “Inhibition of the classical pathway of the complement cascade prevents early dendritic and synaptic degeneration in glaucoma”. *Molecular Neurodegeneration*. 2016 (doi: 10.1186/s13024-016-0091-6), \* co-first author.

## 2015

- Fernandes KA, Harder JM, **Williams PA**, Rausch RL, Kiernan AE, Nair KS, Anderson MG, John SWM, Howell GR, Libby RT. “Using genetic mouse models to gain insight into glaucoma: Past results and future possibilities”. *Experimental Eye Research*. 2015 (doi: 10.1016/j.exer.2015.06.019),
- Lee ST, **Williams PA**, Braine CE, Lin DT, John SWM, Irazoqui PP. “A miniature, fiber-coupled, wireless, deep-brain optogenetic stimulator”. *Transactions on Neural Systems and Rehabilitation Engineering*. 2015 (doi: 10.1109/TNSRE.2015.2391282).

## 2013

- **Williams PA**, Howell GR, Barbay JM, Braine CE, Sousa GL, John SWM, Morgan JE. “Retinal ganglion cell dendritic atrophy in DBA/2J glaucoma”. *PLoS One*. 2013 (doi: 10.1371/journal.pone.0072282),
- **Williams PA**, Thirgood RA, Littlewood E, Votruba M, Oliphant H, Good MA, Williams J, Morgan JE. “Retinal ganglion cell dendritic degeneration in a mouse model of Alzheimer’s disease”. *Neurobiology of Aging*. 2013 (doi: 10.1016/j.neurobiolaging.2013.01.006).

## 2012

- **Williams PA**, Piechota M, Von Ruhland C, Taylor E, Morgan JE, Votruba M. “Opa1 is essential for retinal ganglion cell synaptic architecture and connectivity”. *Brain*. 2012 (doi: 10.1093/brain/awr330).

## 2011

- Barnard AR, Issa PC, Perganta G, **Williams PA**, Davies V, Sekaran S, Votruba M, MacLaren RE. “Specific deficits in visual electrophysiology in a mouse model of dominant optic atrophy”. *Experimental Eye Research*. 2011 (doi: 10.1016/j.exer.2011.07.004),
- **Williams PA**, Morgan JE, Votruba M. “Mouse models of dominant optic atrophy: What do they tell us about the pathophysiology of visual loss?”. *Vision Research*. 2011 (doi: 10.1016/j.visres.2010.08.031).

## 2010

- **Williams PA**, Morgan JE, Votruba, M. “Opa1 deficiency in a mouse model of dominant optic atrophy leads to retinal ganglion cell dendropathy”. *Brain*. 2010 (doi: 10.1093/brain/awq218).

## Patents and Patents Submitted

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- John SWM, **Williams PA**. “Treatment and prevention of ocular neurodegenerative disorder”. US (US20180344719A1), WO (WO2017070647A1), EU (EP3364973A1),
- John SWM, **Williams PA**. “Fat droplets in retina as a diagnostic marker for neurodegeneration and glaucoma in humans”. United States Provisional Patent Application No. 62/429,950.

## Recent Invited Talks

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- **Williams PA**. “Targeting NAD+ for neuroprotection in glaucoma”. 2020 University of Cambridge - Clinical Neurosciences Virtual Seminar,
- **Williams PA**, “The Nicotinamide Story”. Moorfields UCL Glaucoma Seminar 2020, Moorfields Eye Hospital, U.K.,
- **Williams PA**, “The Nicotinamide Story”. MIGS 2020, Moorfields Eye Hospital, U.K.,
- **Williams PA**. “From form to function: the effect of nicotinamide on retinal ganglion cell metabolism and mitochondria”. 2019 Optic Nerve Meeting, Obergurgl, Austria,
- **Williams PA**. “Targeting neuronal mitochondria and metabolism for neuroprotection in glaucoma”. 2019 CERA, Melbourne, Australia,
- **Williams PA**. “Targeting neuronal mitochondria and metabolism for neuroprotection in glaucoma”. 2019 Adelaide University, Adelaide, Australia,
- **Williams PA**. “Targeting neuronal mitochondria and metabolism for neuroprotection in glaucoma”. 2019 SERI / Duke-NUS, Singapore,
- **Williams PA**. “Hur ser möjliga behandlingsformer för glaukom ut i framtiden?”. 2019 Klinisk Optometri, Stockholm, Sweden,
- **Williams PA**. “Targeting neuronal mitochondria and metabolism for neuroprotection in glaucoma”. 2019 Cardiff University – Cornea to Cortex, Cardiff, U.K.,
- **Williams PA**. “Targeting neuronal mitochondria and metabolism for neuroprotection in glaucoma”. 2019 Nordic Glaucoma Meeting, Bergen, Norway,
- **Williams PA**. “Targeting neuronal metabolism and mitochondria for neuroprotection”. 2019 Helsinki University, Finland,
- **Williams PA**. “Targeting neuronal mitochondria for neuroprotection in glaucoma”. 2018 Optic Nerve Meeting, Obergurgl, Austria,
- **Williams PA**. “Ageing, neuronal metabolism, and mitochondria in glaucoma”. 2018 EVER Meeting, Nice, France,
- **Williams PA**. “Targeting neuronal mitochondria for neuroprotection in glaucoma”. 2018 ISER Meeting, Belfast, U.K.,
- **Williams PA**. “NAD supply critically modulates mitochondrial vulnerability in glaucoma”. 2017 St Erik Eye Hospital / Karolinska Institutet, Stockholm, Sweden,
- **Williams PA**. “Ageing, neuronal metabolism, and mitochondria in glaucoma”. 2017 Optic Nerve Meeting, Obergurgl, Austria,
- **Williams PA**. “NAD supply critically modulates mitochondrial vulnerability and neurodegeneration in aged mice”. 2017 UK Dementia Research Institute, Cardiff University, Cardiff, U.K.,
- **Williams PA**. “Mitochondrial dysfunction in glaucoma”. 2017 World Glaucoma Congress – Neuroprotection – The Future of Glaucoma, Helsinki, Finland,
- **Williams PA**. “NAD supply critically modulates mitochondrial vulnerability and neurodegeneration in aged mice”. 2017 UTHSC, Memphis, U.S.A.,
- **Williams PA**. “NAD supply critically modulates mitochondrial vulnerability and neurodegeneration in aged mice”. 2016 Optic Nerve Meeting, Obergurgl, Austria.