Curriculum Vitae

Thomas A. Longden, B.Sc. (Hons), PhD
Assistant Professor, Department of Physiology
University of Maryland Baltimore

Date: 01.18.22

Contact Information

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Education

2003-2006	**B.Sc (Hons), Pharmacology, University of Manchester, UK** Thesis: "Identification of GPRC6A in rat mesenteric arteries" Mentor: Dr. Gillian Edwards.
2006-2010	**PhD, Pharmacology, University of Manchester, UK** Thesis: "Studies on the Expression of Calcium-Activated Potassium Channels in Astrocytes – A Potential Role in Neurovascular Coupling". Mentors: Prof. Arthur Weston and Dr. Gillian Edwards. Examiners: Prof. Christopher Garland (University of Oxford) and Dr. Paulo Tammaro (University of Oxford).

Postdoctoral Training

2010-2011	**Postdoctoral Associate, University of Manchester, UK** Mentors: Prof. Arthur Weston and Dr. Gillian Edwards.
2011-2015	**AHA Postdoctoral Fellow, University of Vermont, USA** Mentor: Prof. Mark Nelson. .

Academic Positions

2015-2018	**Assistant Professor, Research Track, University of Vermont, USA**
2018-present	**Assistant Professor, Tenure Track, University of Maryland Baltimore, USA**

Professional Society Memberships

2006-2012	British Pharmacological Society
2011-2015	American Society for Pharmaceutical and Experimental Therapeutics
2011-present	American Physiological Society
2015-present	Society of General Physiologists
2019-present	Society for Neuroscience

Honors and Awards

2012	**Durwood J Smith Award for Excellence in Pharmacology**

Best presentation. University of Vermont Annual Pharmacology Retreat.

2012 **ASPET Young Scientist Travel Award**
Experimental Biology 2012.

2013 **Durwood J Smith Award for Excellence in Pharmacology**
Best presentation. University of Vermont Annual Pharmacology Retreat.

2014 **Durwood J Smith Award for Excellence in Pharmacology**
Best presentation. University of Vermont Annual Pharmacology Retreat.

2014 **Cardiovascular Pharmacology Postdoc Competition, first runner-up**
American Society for Pharmacology and Experimental Therapeutics. Experimental Biology 2014.

2015 **Symposium Award winner**
Best poster. Society of General Physiologists Annual Meeting 2015.

2015 **Cardiovascular Research Institute of Vermont Travel Award**
Experimental Biology 2015.

2015 **Cardiovascular Research Institute of Vermont Travel Award**
Society of General Physiology 2015 Annual Meeting.

2015 **Japanese Microcirculatory Society Travel Award**
10th World Congress for Microcirculation.

2016 **Society of General Physiology Travel Award**
Society of General Physiology 2016 Annual Meeting.

2016 **Cardiovascular Research Institute of Vermont Young Investigator Award**
Society of General Physiologists 2016 Annual Meeting.

2020 **NIH Director's New Innovator Award**

Administrative Service

Institutional

2018 – 2019	Member, Cardiovascular Research Institute of Vermont Early Career Advisory Committee.
2019	Qualifying Exam Committee, Kevin Herold, Program in Molecular Medicine
2019 – 2020	Faculty Advisory Committee, Brent Stewart, Program in Neuroscience
2019	Member, GPLS award committee, Program in Neuroscience representative
2019 – present	Alternate representative on the School of Medicine Council
2019	SOM Career and Professional Development Office NRSA Mock Study Section
2020 – present	Member, Program in Molecular Medicine Admissions Committee
2020	Qualifying Exam Committee, Kristen Montgomery, Program in Neuroscience
2020	Qualifying Exam Committee, Bosung Shim, Program in Molecular Medicine
2020 – 2021	Faculty Advisory Committee, Dominic Isaacs, Program in Neuroscience
2020 – present	Thesis Committee, Mashhood Wani, Program in Molecular Medicine
2020 – present	Judicial Board
2021	Qualifying Exam Committee, Emily DeMarco, Program in Neuroscience
2021	Qualifying Exam Committee, Taylor Crawford, Program in Molecular Medicine
2021 – 2022	Faculty Advisory Committee, Ruchael McNair, Program in Neuroscience
2021 – 2022	Faculty Advisory Committee, Alexandra Falls, Program in Neuroscience
2021 – present	Thesis Committee, Bosung Shim, Program in Molecular Medicine
2021 – present	Thesis Committee, Alexa Blanchard, Program in Molecular Medicine

Local and National

2007-2010	British Pharmacological Society Young Pharmacologists Committee.

2011-Present	Ad hoc journal peer review:

Advances in Pharmacology (1)
American Journal of Physiology (2)
British Journal of Pharmacology (13)
Cardiovascular Research (1)
Experimental Physiology (1)
Frontiers (2)
Function (1)
Hypertension (1)
Journal of Cerebral Blood Flow and Metabolism (4)
Journal of Vascular Research (1)
Journal of Physiology (2)
Microcirculation (3)
Nature Communications (1)
Neurosignals (1)
Physiological Reports (2)
Proceedings of the National Academy of Sciences (2)
Vascular Pharmacology (1)

2012-2014	Postdoctoral Representative for the Society for Neuroscience, Vermont Chapter.
2017	Reviewer, French National Research Agency.
2017	Guest Editor, *Microcirculation* Special Themed Issue, January 2017.
2017	Member, 11th World Congress for Microcirculation Scientific Advisory Committee.
2018	Reviewer, American Heart Association/Allen Brain Health Initiative.
2018-2019	Conference organizer, SMUG 2019, Experimental Biology 2019 Satellite, Orlando FL.
2018	Member, ISRA 2020 Scientific Advisory Committee.
2019	Reviewer, National Science Foundation.
2019	Reviewer, American Heart Association.
2019 - Present	Reviewing Editor, *Frontiers in Physiology.*
2019 - Present	Treasurer, Greater Baltimore Society for Neuroscience
2020 - Present	Editorial Board Member, *Microcirculation*
2020	Session Chair, "Signals and the pathogenesis of vascular disease." *Vascular Biology 2020, North American Vascular Biology Organization.*
2021	Reviewer, NIH Special Emphasis Panel September 2021, Cellular and Molecular Neuroscience.
2022	Reviewer, American Heart Association Career Development Award.
	Reviewer, MPower Seed Grant Challenge.

Teaching

2006-2010	Postgraduate Demonstrator, University of Manchester, UK.
2015-2016	Lecturer, Molecular Physiology and Biophysics (MPBP301)
	10 1st-2nd year graduate students – 3 contact hours/year.
2017	Lecturer, Topics in Molecular and Cellular Pharmacology (PHARM290)
	40 2nd year undergraduate students – 3 contact hours.
2017	Lecturer, Neuropsychopharmacology (PSYS316)
	40 3rd year undergraduate students – 3 contact hours.
2018	Lecturer, Topics in Molecular and Cellular Pharmacology (PHARM290)
	40 2nd year undergraduate students – 3 contact hours.
2019	GPLS 601 Mechanisms in Biomedical Sciences Core Course
	– Sorting in the *Trans* Golgi Network and Targeted Delivery of Membrane Proteins
	Lecturer and paper sponsor – 3 contact hours.
2020	GPLS 601 Mechanisms in Biomedical Sciences Core Course
	– Protein Trafficking in the ER
	– Vesicle Trafficking Mechanisms and Exocytosis
	– Sorting in the *Trans* Golgi Network and Targeted Delivery of Membrane Proteins
	Lecturer and paper sponsor – 8 contact hours

– Signaling problem set group leader
Medical School Renaissance Curriculum
– Action Potential Generation and Propagation – 3 contact hours
GPLS 691 Current Topics in Neuroscience
– Multiphoton Imaging at the Blood-Brain Interface - 1 contact hour
GPLS 737 Proseminar in Experimental Design
– Teaching Assistant - 2 contact hours per week, fall semester
GPLS 750 Topics in Molecular Medicine
– Vascular Physiology and Pathophysiology - 2 contact hours.

2021 GPLS 601 Mechanisms in Biomedical Sciences Core Course
– Vesicle Trafficking Mechanisms and Exocytosis
– Sorting in the *Trans* Golgi Network and Targeted Delivery of Membrane Proteins
Lecturer and paper sponsor – 7 contact hours total
GPLS 737 Proseminar in Experimental Design
– Course director and instructor - 30 contact hours through fall semester
GPLS 691 Current Topics in Neuroscience
– Multiphoton Imaging at the Blood-Brain Interface - 1 contact hour
GPLS 750 Topics in Molecular Medicine
– Vascular Physiology and Pathophysiology - 2 contact hours.

2022 Advances in Neuropharmacology through Modern Neuroscience Methods
– Multiphoton Microscopy and Neurovascular Interactions - 2 contact hours.

Mentored Students:

2014	Julia Campbell (B.Sc in Psychology, final year thesis). Present position: Masters Candidate, Boston University.
2015-2017	Benjamin Dahlgren (M.Sc in Pharmacology, final year thesis). Present position: Associate Biochemist at GlaxoSmithKline.
2018	Matthew Broomer (B.Sc in Psychology). Present position: PhD Candidate, University of Vermont.
2018	Daniel Enders (M.Sc in Pharmacology). Present position: Research technician, University of Vermont.
2019-present	Brent Stewart. PhD Candidate, Program in Neuroscience, University of Maryland. Advisor.
2020	Colin Robertson. PhD Candidate, Program in Neuroscience, University of Maryland. Lab rotation.
2020-present	Luiruimin (Amy) Xiang. PhD Candidate, Program in Neuroscience, University of Maryland.
2021	Isabella Zafra. PhD Candidate, Program in Neuroscience, University of Maryland. Lab rotation.
	Ryan Mayers. PhD Candidate, Program in Neuroscience, University of Maryland. Lab rotation.
2021-present	Abigail Vigderman. PhD Candidate, Program in Neuroscience, University of Maryland.
2021-present	Dominic Isaacs. PhD Candidate, Program in Neuroscience, University of Maryland.
2022	Julia Whitten. PhD Candidate, Program in Neuroscience, University of Maryland. Lab rotation.

Grant Support

Active

1R01AG066645 (PI: Thomas Longden) 9/1/20-8/31/25

National Institute on Aging

Title: Pericytes as metabolic sentinels in the control of brain blood flow in health and Alzheimer's disease

This project examines the role of pericytes in the control of cerebral blood flow, and how changes in metabolic substrate availability regulate their function in health and Alzheimer's disease.

Role: Principal Investigator

1DP2OD02944801 (PI: Thomas Longden) 8/15/20-6/30/25
NIH Directors New Innovator Award Program
Title: Vascular Signaling Plasticity - Novel Concepts and Tools for Studying Neurovascular Interactions in Health and Disease
This project examines the reprogramming of vascular function in response to neuroplasticity, to precisely match energy demand to supply.
Role: Principal Investigator

19IPLOI34660108 (PI: Thomas Longden) 7/1/19-6/30/21
American Heart Association Innovative Project Award
Title: Blood flow in learning and memory
This project uses advanced imaging approaches to assess the role of adequate blood flow in learning and memory, and how disruption of blood flow in dementia impacts this.
Role: Principal Investigator

5R01NS115401 (PI: Sava Sakadzic) 5/1/21-04/30/24
National Institute of Neurological Disorders and Stroke
Title: Investigating the microvascular mechanisms of O2 supply-demand mismatch in small vessel disease using novel high-resolution optical imaging.
Here we aim to contribute to this larger project by understanding the disruption of smooth muscle and pericyte calcium in the CADASIL model of cerebral small vessel disease.
Role: Subcontracted co-investigator.

Completed
12POST12090001 (PI: Thomas Longden) 07/01/12-06/30/14
American Heart Association Founders Affiliate Postdoctoral Fellowship
Title: Neurovascular Coupling in Chronic Stress
The goal of this study was to elucidate the molecular mechanism underlying the impairment of neurovascular coupling by chronic stress.
Role: Principal Investigator
Total awarded: $87,000

14POST20480144 (PI: Thomas Longden) 07/01/14-06/30/15
American Heart Association Founders Affiliate Postdoctoral Fellowship
Title: Hemodynamic Contributions to the Control of Neuronal Function
The goal of this study was to apply optogenetic and pharmacological techniques *in vivo* to elucidate whether changing cerebral blood flow to specific brain regions influences neuronal activity and animal behavior.
Role: Principal Investigator
Total awarded: $47,000

4P20GM103644-04 (PI: Stephen Higgins) 8/1/17-12/31/18
NIH/DHHS Vermont Center on Behavior and Health COBRE
Title: The effects of stress on capillary-to-arteriole communication
This project examines how stress impacts control of cerebral blood flow by capillaries by disrupting capillary electrical and Ca^{2+} signaling mechanisms

Role: Project Director (equivalent to PI for one sub-project of the COBRE) (35%)
Total awarded: $561,600

17SDG33670237/1-3 (PI: Thomas Longden) 7/1/17-6/30/20
American Heart Association Scientist Development Grant
Title: Vascular signaling plasticity in the brain
This project examines the metacontrol of cerebral blood flow by tuning of the expression of key molecular players in the vasculature in response to neural activity.
Role: Principal Investigator (50%)
Total awarded: $231,000

Publications

Peer reviewed journal articles

1. **Longden T**, Dunn K, Draheim H, Nelson M, Weston A, Edwards G (2011) "Intermediate-Conductance Calcium-Activated Potassium Channels Participate in Neurovascular Coupling." *British Journal of Pharmacology*, **164(3):** 922-33.

2. **Longden T**, Dabertrand F, Hill-Eubanks D, Hammack S, Nelson M (2014) "Stress-Induced Glucocorticoid Signaling Remodels Neurovascular Coupling Through Impairment of Cerebrovascular Inwardly Rectifying K^+ Channel Function." *Proceedings of the National Academy of Sciences USA*, **111(20):** 7462-7.

3. Villalba N, Sonkusare S, **Longden T**, Tran T, Sackheim A, Nelson M, Wellman G, Freeman K (2014) "Traumatic brain injury disrupts cerebrovascular tone through endothelial inducible nitric oxide synthase expression and nitric oxide gain of function." *Journal of the American Heart Association*, **3(6):** e001474.

4. **Longden T**, Nelson M (2015) "Vascular Inward Rectifier K^+ Channels as External K^+ Sensors in the Control of Cerebral Blood Flow." *Microcirculation*, **22(3):** 183-196.

5. Balbi M, Ghosh M, **Longden T**, Vega M, Gesierich B, Hellal F, Lourbopoulos A, Nelson M, Plesnila N (2015) "Dysfunction of mouse cerebral arteries during early aging" *Journal of Cerebral Blood Flow & Metabolism* **35(9):** 1445-1453.

Role: Performed multiphoton imaging experiments and analyzed data. Edited manuscript.

6. **Longden T**, Hill-Eubanks D, Nelson M (2016) "Ion Channel Networks in the Control of Cerebral Blood Flow" *Journal of Cerebral Blood Flow & Metabolism*, **36(3):** 492-512.

7. Klitgaard-Povlsen G, **Longden T**, Bonev A, Hill-Eubanks D, Nelson M (2016) "Uncoupling of Neurovascular Communication After Transient Global Cerebral Ischemia is Caused by Impaired Parenchymal Smooth Muscle K_{IR} Channel Function" *Journal of Cerebral Blood Flow & Metabolism*, **36(7):** 1195-1201.

Role: Performed multiphoton imaging experiments and analyzed data. Wrote and edited manuscript.

8. Tykocki N, Bonev A, **Longden T**, Heppner T, Nelson M (2017) "Inhibition of vascular smooth muscle inward-rectifier K^+ channels restores myogenic tone in mouse urinary bladder arterioles" *American Journal of Physiology Renal Physiology*, **312(5):** F836-F847.

Role: Performed electrophysiological experiments and analyzed data. Edited manuscript.

9. **Longden T**, Dabertrand F, Koide M, Gonzales A, Tykocki N, Brayden J, Hill-Eubanks D, Nelson M (2017) "Capillary K^+-sensing initiates retrograde hyperpolarization to locally increase cerebral blood flow" *Nature Neuroscience*, **20:** 717-726.

10. Harraz O, **Longden T**, Dabertrand F, Hill-Eubanks D, Nelson M (2018) "Endothelial GqPCR activity controls capillary electrical signaling and brain blood flow through PIP_2 depletion" *Proceedings of the National Academy of Sciences USA*, **115(15):** E3569-E3577.
Role: Performed multiphoton imaging experiments and analyzed data. Edited manuscript.

11. Harraz O, **Longden T**, Hill-Eubanks D, Nelson M (2018) "PIP_2 depletion promotes TRPV4 channel activity in mouse brain capillary endothelial cells" *eLife*. **7:** e38689.
Role: Performed initial electrophysiological experiments and analyzed data. Edited manuscript.

12. Moshkforoush A, Ashenagar B, Harraz O, Dabertrand F, **Longden T**, Nelson M, Tsoukias N. (2020) "Capillary Kir channel as sensor and amplifier of neuronal signals: modeling insights on K^+-mediated neurovascular communication." *Proceedings of the National Academy of Sciences USA.* **117(28):** 16626-16637.
Role: Provided raw data to support modeling. Edited manuscript.

13. Cleary C, Moreira T, Takakura A, Nelson M**, Longden T**, Mulkey D. (2020) "Vascular control of the CO_2/H^+-dependent drive to breathe in mice." *eLife* **9:** e59499.
Role: Guided Ca^{2+} imaging data acquisition and analysis. Edited manuscript.

14. Mughal A, Sackheim A, Sancho M, **Longden T**, Russell S, Lockette W, Nelson M, Freeman K. (2020) "Impaired capillary-to-arteriolar electrical signaling after traumatic brain injury." *Journal of Cerebral Blood Flow & Metabolism*. Accepted.
Role: Acquired and analyzed imaging data. Edited manuscript.

15. Hariharan A, Weir N, Robertson C, He L, Betsholtz C, **Longden T** (2020) "The ion channel and GPCR signaling toolkit of CNS pericytes" *Frontiers in Cellular Neuroscience* **14:** 423.

16. Dabertrand F, Harraz O, Koide M, **Longden T**, Rosehart A, Hill-Eubanks A, Joutel A, Nelson M (2021) "PIP_2 corrects cerebral blood flow deficits in small vessel disease by rescuing capillary Kir2.1 activity" *Proceedings of the National Academy of Sciences USA* **118:** e2025998118.
Role: Performed *in vivo* imaging experiments and analyzed data. Edited manuscript.

17. **Longden T***, Mughal A, Hennig G, Harraz O, Shui B, Lee F, Lee J, Reining S, Kotlikoff M, Konig G, Kostenis E, Hill-Eubanks D, Nelson M (2021) "Local IP3 receptor-mediated Ca2+ signals compound to direct blood flow in brain capillaries". *Science Advances*. **7:** eabh0101.
*First and co-corresponding author.
Role: Directed experimental design, performed experiments and analyzed data, wrote and edited the paper.

18. Rosehart A, **Longden T**, Joutel A, Dabertrand F (2021) "Prostaglandin E2 dilates intracerebral arterioles when applied onto capillaries, implication in small vessel diseases" *Frontiers in Aging Neuroscience* **13:** 402.
Role: Performed experiments and analyzed data, edited the paper.

19. Koide M, Harraz O, Dabertrand F, **Longden T**, Ferris H, Wellman G, Hill-Eubanks D, Greenstein A, Nelson M (2021) "Differential restoration of functional hyperemia by antihypertensive drug classes in hypertension-related cerebral small vessel diseases" *Journal of Clinical Investigation*, online ahead of print.
Role: Performed experiments and analyzed data, edited the paper.

20. Hariharan A, Robertson C, **Longden T** (2022) "Pericytes are metabolic sentinels that tune blood flow according to brain glucose import". In preparation.

21. Xiang L, Hariharan A, **Longden T** (2022) "K_{ATP} channels as metabolic sentinels in the brain". *Frontiers in Molecular Neuroscience.* In preparation.

22. Hariharan A, Zhao G, Lederer WJ, **Longden T** (2022) "Control of blood flow by pericytes in heart and brain". *Annual Review of Physiology.* In preparation.

23. Weir N, Xiang L, Garcia DG, **Longden T** (2022) "Vascular signaling plasticity precisely matches metabolic supply to neuronal demand in the brain". In preparation.

Commentaries:

1. Weir N, **Longden T** (2021) "Pathologically Entangled: Brain trauma-evoked ROS imbalance disrupts Kir channel function in distant peripheral vessels". Function, **2:** zqab021.

Book Chapters:

1. Garcia D, **Longden T** (2020) "Ion channels and Ca^{2+} signaling in the capillary endothelium". Current Topics in Membranes, **85:** 261-300.

Editorials:

1. Welsh D, **Longden T** (2017) "Endothelial Signaling and the Dynamic Regulation of Arterial Tone: A Surreptitious Relationship" *Microcirculation,* **24(3):** 10.1111/micc.12370.

Abstracts:

1. Harno E, Weston A, **Longden T**, Absi M, Ruat M, Dodd R, Edwards G (2006) "Evidence for the presence of GPRC6A in the rat mesenteric artery." *Acta Pharmacolica Sinica* **27 (1):** 155-156.

2. **Longden T**, Edwards G, Weston A, Draheim H, Hengerer B (2008) "Evidence in favour of an intermediate-conductance calcium-activated potassium channel in cortical astrocytes" *Fundamental and Clinical Pharmacology* **22(2):** 9.

3. **Longden T**, Draheim H, Weston A, Edwards G (2009) "The Expression of Small- and Intermediate-Conductance Calcium-Activated Potassium Channels in Astrocytes of the Mouse Brain" *Proceedings of the British Pharmacological Society* at www.pA2online.org/abstracts/Vol7Issue4abst001P.pdf

4. **Longden T**, Nelson M (2011) "Recruitment of the Vascular Endothelium into Neurovascular Coupling" *Proceedings of the British Pharmacological Society* at bps.conference-services.net/resources/344/2833/pdf/bpswinter2011_0113.pdf

5. **Longden T**, Nelson M (2012) "Recruitment of the Vascular Endothelium into Neurovascular Coupling." *FASEB Journal* **26:** 842.4.

6. **Longden T**, Dabertrand F, Hammack S, Nelson M (2013) "Impairment of Neurovascular Coupling by Chronic Stress" *FASEB Journal* **27:** 925.9.

7. N Villalba, **T Longden**, M Nelson, G Wellman, K Freeman (2014) "Enhanced endothelial nitric oxide production impairs cerebrovascular tone after brain trauma" *FASEB Journal* **28:** 1070.1.

8. **Longden T**, Bonev A, Nelson M (2014) "Calcium Signaling in the Choroid Plexus Epithelium." *FASEB Journal* **28:** 1097.11.

9. **Longden T**, Dabertrand F, Hill-Eubanks D, Hammack S, Nelson M (2014) "Glucocorticoid Signaling Mediates Stress-Induced Impairment of Neurovascular Coupling" *FASEB Journal* **28:** 841.4.

10. **Longden T**, Nelson M (2015) "Unique Ion Channel Properties of Brain Capillary Endothelial Cells" *FASEB Journal* **29:** 832.9.

11. **Longden T**, Nelson M (2015) "Potassium sensing by capillary K_{IR} channels regulates cerebral blood flow" *Journal of General Physiology* **146(3):** 10A.

12. Gonzales A, **Longden T**, Shui B, Kotlikoff M, Nelson M (2015) "Contractile Pericytes Determine the Direction of Blood Flow at Capillary Bifurcations." *Journal of General Physiology* **146(3):** 6A-7A.

13. Dabertrand F, Harraz O, **Longden T**, Brayden J, Nelson M (2016) "Remote Control of Intracerebral Arteriole Diameter by Capillary TRPV4 and TRPV3 Channels." *FASEB Journal* **30:** Ib780.

14. Gonzales A, **Longden T**, Dabertrand F, Shui B, Kotlikoff M, Nelson M (2016) "Pericyte-Mediated Alterations of Blood Flow Distribution at Capillary Bifurcations in a Genetic Model of Cerebral Ischemic Small Vessel Disease" *Journal of General Physiology* **148(2):** 13A.

15. **Longden T**, Nelson M (2016) "Critical Role of Nitric Oxide in Capillary-to-Arteriole Electrical Signaling in the Brain" *Journal of General Physiology* **148(2):** 22A-23A.

16. Harraz O, **Longden T**, Dabertrand F, Nelson M (2017) "Capillary endothelial Gq protein-coupled receptors and PIP_2 toggle signaling between TRPV4 and Kir2 channels in the brain" *FASEB Journal* **31:** 681.1

17. Moshkforoush A, **Longden T**, Dabertrand F, Nelson M, Tsoukias N (2017) "A Mathematical Model of Cerebral Blood Flow Control: Role of Kir Channels" *FASEB Journal* **31:** 684.20.

18. Moshkforoush A, **Longden T**, Dabertrand F, Harraz O, Nelson M, Tsoukias N (2018) "Kir mediates Regenerative and Directional Conduction of Hyperpolarization in Brain Capillaries: Importance for Neurovascular Coupling" *FASEB Journal* **32:** 712.12.

19. **Longden T**, Harraz O, Hennig G, Shui B, Lee F, Lee J, Reining S, Kotlikoff M, Kostensis E, König G, Hill-Eubanks D, Nelson M (2019) "Neural activity drives dynamic Ca2+ signals in capillary endothelial cells that shape local brain blood flow" *FASEB Journal* **33:** 688.8.

20. Freeman K, **Longden T**, Mughal A, Boucher M, Sackheim A, Russell S, Hennig G, Lockette W, Nelson M (2019) "Traumatic brain injury impairs cerebral blood flow regulation through disruption of inside-out signaling between capillaries and upstream arterioles" *Shock* **51:** 104.

21. Koide, Dabertrand F, **Longden T**, Harraz O, Tykocki N, Wellman G, Nelson M (2019) "Crippled capillary-to-arteriole electrical signaling impairs functional hyperemia in a mouse model of chronic hypertension" *Journal of Cerebral Blood Flow & Metabolism*, **39:** 51.

22. Mughal A, Longden T, Hennig G, Nelson M (2020) "Endothelial Ca^{2+} Signals in Penetrating Arterioles Control Local Blood Flow in the Brain" *FASEB Journal* **34:** s1.04433.

23. Hariharan A, Robertson C, Betsholtz C, **Longden T** (2020) "Capillary Pericyte K_{ATP} Channel Activation Drives the Dilation of Upstream Cerebral Arterioles" *Biophysical Journal* **120:** 326a.

Major Invited Speeches

1. **Federation of European Pharmacological Societies.** Platform talk. "The role of Astrocytic IK channels in Neurovascular Coupling". Manchester, UK, 2008.
2. **NBH Research Forum.** Vermont chapter of the Society for Neuroscience. Speaker. "Neurovascular coupling in the stressed amygdala". Burlington, VT, 2014.
3. **Neuroscience.** Nanosymposium speaker. "Stress-induced glucocorticoid signaling remodels neurovascular coupling through impairment of cerebrovascular K_{IR} channel function". Washington, DC, 2014 .
4. **University of Oxford, UK.** Department of Pharmacology, invited seminar. "Stress-induced glucocorticoid signaling remodels neurovascular coupling through impairment of cerebrovascular K_{IR} channel function". Oxford, UK, 2014
5. **Smooth Muscle Underground.** Invited speaker. "Stress-induced glucocorticoid signaling remodels neurovascular coupling through impairment of cerebrovascular K_{IR} channel function". San Diego, CA, 2014.
6. **Experimental Biology.** Invited speaker. "Potassium Sensing by Capillary K_{IR} Channels Regulates Cerebral Blood Flow". San Diego, CA, 2016.

7. **FASEB Smooth Muscle Congress.** Invited Speaker. “Control of brain blood flow by capillary-to-arteriole communication”. Lisbon, Portugal, 2016.

8. **UC Davis Distinguished Lecture in Physiology.** Department of Physiology and Membrane Biophysics, invited seminar. “Translating thought into blood flow: Capillary-to-arteriole communication in the brain”. Davis, CA, 2016

9. **University of Reno, NV.** Department of Physiology, invited seminar. “Translating thought into blood flow: Capillary-to-arteriole communication in the brain.” Reno, NV, 2016

10. **NBH Research Forum.** Vermont chapter of the Society for Neuroscience. Speaker. “Brain capillaries act as a sensory web to translate neural activity into blood flow”. Burlington, VT, 2017.

11. **ISRA 2017.** Invited speaker. Title: “Capillary-to-arteriole communication regulates blood flow into the brain”. Manchester, UK, 2017.

12. **University of Maryland.** Department of Physiology, invited seminar. Title: “Control of brain blood flow by capillary calcium signaling”. Baltimore, MD, 2017.

13. **11th World Congress for Microcirculation.** Platform talk. “Capillary Ca^{2+} Signals Generate Nitric Oxide to Tune Local Brain Blood Flow”. Vancouver, Canada, 2018.

14. **UC Davis, CA.** Department of Physiology and Membrane Biophysics, invited seminar. “Food for Thought: Capillary Control of Cerebral Blood Flow”. Davis, CA, 2018.

15. **University of Pennsylvania.** Department of Physiology, invited seminar. “Food for Thought: Capillary Control of Cerebral Blood Flow”. Philadelphia, PA, 2018.

16. **University of Maryland.** Department of Anatomy and Neurobiology, invited seminar. “Food for Thought: Capillary Control of brain blood flow”. Baltimore, MD, 2020.

17. **Microcirculatory Society Cerebral Blood Flow Webinar.** Invited speaker. “Capillary Calcium Signaling in the Brain.” Online, 2020.

18. **Texas A & M University.** Department of Medical Physiology, invited seminar. “Capillary Control of Brain Blood Flow”. Online, 2021.

19. **University of Virginia.** Department of Molecular Physiology and Biological Physics, invited seminar. “Metabolic Control of Brain Blood Flow Through Endothelial and Pericyte Interactions”. Online, 2021.

20. **Tulane University.** Department of Pharmacology, invited seminar. “Vascular Signaling Plasticity”. New Orleans, LA, 2021.

20. **ISRA 2021.** Invited speaker. “Vascular Signaling Plasticity”. Lake Tahoe, CA, USA, 2021. Postponed until 2023.

21. **12th World Congress for Microcirculation.** Platform talk. “Pericytes are metabolic sentinels that protect brain energy supply”. Beijing, China, 2022.

22. **7th UC Davis Cardiovascular Symposium.** Expert panelist. Davis, CA, 2022.

23. **University of Tennessee Health Science Center.** Department of Physiology, invited seminar. “Vascular Signaling Plasticity”. Online, 2022.

Proffered Communications

1. **World Pharma.** Poster presentation “Astrocytic IK channels contribute to neurovascular coupling”. Copenhagen, Denmark, 2010.