**CURRICULUM VITAE FOR ACADEMIC PROMOTION**

The Johns Hopkins University School of Medicine

**NAME:** Seth Blackshaw Updated: December 3rd, 2024

**Current Appointments**

3/04 -5/11 Assistant Professor, Departments of Neuroscience, Neurology, and Ophthalmology, and Assistant Investigator, Institute for Cell Engineering and Kavli Neuroscience Discovery Institute, Johns Hopkins University School of Medicine, Baltimore, MD 21287

5/11-10/15 Associate Professor, Departments of Neuroscience, Neurology, and Ophthalmology, and Associate Investigator, Institute for Cell Engineering and Center for High-Throughput Biology, Johns Hopkins University School of Medicine, Baltimore, MD 21287

10/15-present Professor, Departments of Neuroscience, Neurology, and Ophthalmology, and Investigator, Institute for Cell Engineering and Kavli Neuroscience Discovery Institute, Johns Hopkins University School of Medicine, Baltimore, MD 21287

**Education and Training**

1991Bachelor of Arts, Biology, University of Chicago, Chicago, IL

1991Master of Science, Biochemistry, University of Chicago, Chicago, IL

1997PhD, Neuroscience, Johns Hopkins University School of Medicine, Baltimore, MD

1997-1999 Postdoctoral fellow, laboratory of Dr. Solomon Snyder, Department of Neuroscience, Johns Hopkins University School of Medicine, Baltimore, MD

1999-2004 Postdoctoral fellow, laboratory of Dr. Connie Cepko, Department of Genetics, Harvard Medical School, Boston, MA

**Key original scientific publications**:

**Original Scientific Publications**

1. Li X-J, **Blackshaw S**, Snyder SH. Expression and localization of amiloride-sensitive sodium channel indicates a role for non-taste cells in taste perception. *Proc Natl Acad Sci USA* 1994 91:1814-1818.

2. O'Brien R, Mammen AL, **Blackshaw S**, Ehlers MD, Rothstein JD, Huganir RL The development of excitatory synapses in cultured rat spinal cord. *J Neurosc*i 1997 17:7339-7350.

3. Eliasson MJL,\***Blackshaw S**\*, Schell MJ, Snyder SH. Alternative splice forms of neuronal nitric oxide synthase: prominent neuronal localizations. *Proc Natl Acad Sci USA* 1997 94:3396-3401. (\* indicates equal contribution by both authors).

4. **Blackshaw S**, Snyder SH. Parapinopsin, a novel catfish opsin localized to the parapineal organ, defines a new gene family. *J Neurosci* 1997 17:8083-8092.

5. **Blackshaw S**, Snyder SH. Developmental expression pattern of phototransduction components in mammalian pineal implies a light-sensing function. *J Neurosci* 1997 17:8074-8082.

6. Wolosker H, Kline D, Bian Y, **Blackshaw S**, Cameron AM, Fralich TD, Schnaar RL, Snyder SH. Molecularly cloned mammalian glucosamine 3-phosphate deaminase localizes to transporting epithelium and lacks oscillin activity. *FASEB J* 1998 12:91-101.

7. Walensky L D, Gascard P, Fields ME, **Blackshaw S,** Conboy JG, Mohandas N, Snyder SH. Immunophilin FKBP13 interacts with a novel homologue of the erythrocyte membrane cytoskeletal protein 4.1. *J Cell Biol* 1998 141:143-153.

8. Walensky L D, Ruat M, Bakin RE, **Blackshaw S,** Ronnett GV, Snyder SH. Two novel odorant receptor families expressed in spermatids undergo 5'-splicing. *J Biol Chem* 1998 273:9378-9387.

9. Lai MM, Burnett PA, Wolosker H, **Blackshaw S,** Snyder SH. Cain: a novel physiologic protein inhibitor of calcineurin. *J Biol Chem* 1998 273:18325-18332.

10. Burnett P E, **Blackshaw S,** Lai MM, Quereshi IA, Burnett AF, Sabatini DM, Snyder SH. Neurabin is a synaptic protein linking p70 S6 kinase and the neuronal cytoskeleton. *Proc Natl Acad Sci USA* 1998 95:8351-56

11. Walensky LD, Zheng TS, **Blackshaw S,** DeVries AC, Demas GD, Gascard P, Nelson R J, Conboy J G, Rubin E M, Snyder SH, Mohandas N. Focal neurobehavioral deficits in mice lacking the erythrocyte membrane cytoskeletal protein 4.1. *Curr Biol* 1998 8:1296-72.

12. Kriegsfeld, LJ, Eliasson MJL, Demas GE, **Blackshaw S,** Dawson TM, Nelson RJ, Snyder SH. Nocturnal motor coordination deficits in neuronal nitric oxide synthase knock-out mice. *Neuroscience* 1999 89:311-15.

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14. Sabatini DM, Barrow RK, **Blackshaw S,** Fields M, Kirsch J, Betz H, Snyder SH. Interaction of RAFT1 with the clustering protein gephyrin required for rapamycin-sensitive signaling. *Science* 1999 294:1161-64.

15. Walensky LD, **Blackshaw S,** Liao D, Watkins C, Weier H-UG, Huganir RL, Conboy J G, Mohandas N, Snyder SH. A novel neuron-enriched homologue of the erythrocyte membrane cytoskeletal protein 4.1 is associated with synapses. *J Neurosci* 1999 19:6457-6467.

16. Demas GE, Kreigsfeld LJ, **Blackshaw S,** Nelson RJ, Snyder SH. Elimination of aggression in mice lacking endothelial nitric oxide synthetase. *J Neurosci* 1999 RC30,1-5.

17. Wolosker H, **Blackshaw S,** and Snyder SH. Serine racemase: a glial enzyme synthesizing D-serine to regulate glutamate-NMDA neurotransmission. *Proc Natl Acad Sci USA* 1999 96:13409-14.

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46. Xie Z, Hu S, **Blackshaw S**, Zhu H, Qian J. hPDI: a database of experimental human protein-DNA interactions. *Bioinformatics* 2010 26:287-89.

47. Rapicavoli N, Poth E, **Blackshaw S.**The long noncoding RNA RNCR2 directs mouse retinal cell specification. *BMC Dev Biol* 2010 10:49.

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Chang C, Chen R, Kam TI, Jeong JS, Xie Z, Neifert S, Qian J, **Blackshaw S**, Zhu H, Song H, Ming GL, Dawson VL, and Dawson TM. Identification of the PARP-1 dependent AIF-associated nuclease. *Science* 2016 354: pii: aad6872.

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Lhx6-positive neurons of the zona incerta differentially regulate sleep pressure and recovery sleep. *eLife*, under review.

199. Palazzo I, Lyu P, Yang J, Campbell L, Hyde D, Qian J, and **Blackshaw S**. Comparative analysis of

evolutionarily-conserved and species-specific mechanisms controlling cellular aging in retina. *Nature Aging,* under review.

200. Appel H, Santiago C, Ma W, and **Blackshaw S**. Progressive temporal divergence of *Nfia/b/x*-deficient retinal

 progenitor cells lead to both rescue of late-born bipolar and Muller cell generation and formation of ectopic

 ciliary margin-like cells. *Dev Cell*, under review.

**Peer-reviewed review articles and book chapters**

1. Rapicavoli NA, **Blackshaw S.** New meaning in the message: noncoding RNAs and their role in retinal development. *Dev Dynam*, 2009 238:2103-14.

2. Byerly MS, **Blackshaw S.** Development of vertebrate retina and hypothalamus, *Wiley Interdisciplinary Reviews: Systems Biology and Medicine*, 2009 1:380-9.

3. Hu S, Xie Z, Qian J, **Blackshaw S**, Zhu H. Functional protein microarray technology. *Wiley Interdisciplinary Reviews: Systems Biology and Medicine*, 2010 3:255-68.

4.  **Blackshaw S**, Scholpp S, Placzek M, Ingraham H, Simerly R, Shimogori T. Molecular pathways controlling development of thalamus and hypothalamus: from neural specification to circuit formation. *J Neurosci*. 2010 30:14925-30.

5. Zhi X, Hu S, **Blackshaw S**, Qian J, Zhu H. Systematic characterization of protein-DNA interaction. *Cell Mol Life Sci* 2011 68:1657-68.

6. Lee DA, **Blackshaw S**. Functional Implications of Hypothalamic Neurogenesis in the Adult Mammalian Brain. *Int J Developmental Neuroscience*, 2012 30:615-21.

7. Lee DA and **Blackshaw S**. Feed your head: neurodevelopmental regulation of metabolism. *Ann Rev Physiol,* 2014 76:197-223.

8. Clark BS and **Blackshaw S**. Long noncoding RNA-dependent transcriptional regulation in neuronal development and disease. *Frontiers in Genetics*, 2014 5:164.

9. Bedont JL, **Blackshaw S**, and Newman EA. Molecular mechanisms controlling hypothalamic development. *Wiley Interdisciplinary Reviews: Developmental Biology*, 2015 10.1002/wdev.18

10. Bedont JL and **Blackshaw S**. Development of hypothalamic neural circuitry controlling circadian timing and sleep. *Frontiers in Neuroscience*, 2015 9:74.

11. Regulation of body weight and metabolism by tanycyte-derived neurogenesis in young adult mice. **Blackshaw S**, LeeDA, PakT, and Yoo S. In *Stem Cells in Neuroendocrinology*, Springer, 2016.

12. Clark BS and **Blackshaw S**. Understanding the role of lncRNAs in neuronal development. Long Noncoding

 RNA Biology, *Springer Advances in Experimental Biology and Medicine*, 2017;1008:253-28.

13. de Melo J and **Blackshaw S**. *In vivo* electroporation of developing mouse retina. Retinal Gene Therapy, in *Methods in Molecular Biology*, 2018, 1715:101-111.

14. Yoo S and **Blackshaw S**. Regulation and function of neurogenesis in adult mammalian hypothalamus. *Progress in Neurobiology* 2018 170:53-66.

15. Ramos-Lopez P, Irizarry J, Pino I and **Blackshaw S**. Protein microarray-based profiling of antibody

specificity. *Methods in Molecular Biology,* 2018, 1785:223-229.

1. Kim DW and **Blackshaw S**. Winding the clock: development of hypothalamic neural circuitry controlling circadian timing and sleep. *Developmental Neuroendocrinology* 2020, Masterclass in Neuroendocrinology 9, Springer Nature, ISBN: 9783030400019.
2. **Blackshaw S**. Why has the ability to regenerate following CNS injury been repeated lost during the course of evolution? *Front Insight* 2022, 6:831062.
3. Zhang X, Leavey P, Appel H, Makrides N, and **Blackshaw S**. Molecular mechanisms controlling vertebrate retinal patterning, neurogenesis, and cell fate specification. *Trends in Genetics* 2023, 39:736-757.
4. **Blackshaw S**, Qian J, and Hyde D. New pathways to neurogenesis: insights from injury-induced retinal regeneration. *Bioessays* 2024 e2400133.
5. Placzek M, Chinnaya K, Kim DW, and **Blackshaw S.** Molecular mechanisms controlling development of the tuberal hypothalamus. *Nat Rev Endocrinology,* 2024 21:118-30.
6. **Blackshaw S** and Cayouette M**.** Timing development and regeneration. *Curr Opin Neurosci* 2025*,* 91:102976.

**Inventions, Patents, Copyrights**

1. Li X, **Blackshaw S,** and Snyder SH. Amiloride-sensitive sodium channel and method of identifying substances which stimulate or block salty taste perception. #8,376,362. 12/2/97 (patent awarded)

2. Zhu H and **Blackshaw S**. Collection of 17,000 Unique Full-length Human Open Reading Frames (ORFs) that are Cloned into Both Bacterial and Yeast Protein Expression Vectors (C10326). Reported: 4/4/08

3. Zhu H and **Blackshaw S**. Human Proteome Microarray (C10807). Reported: 7/15/09

4. Boeke J, Zhu H, **Blackshaw S,** Eichinger DJ, Pino I. Methods and systems for generating, validating and using monoclonal antibodies (C11001). Reported: 2/24/11

5. Onishi A and **Blackshaw S.** Treatment of rod photoreceptor dystrophy using DY131 (C10854). Reported: 10/30/09

6. Liu K, Brown S, and **Blackshaw S**. Lhx6-expressing neurons of the zona incerta promote both REM and non-REM sleep (C14942).

7. Venkataraman A, and **Blackshaw S**. Engineered fusion proteins for targeted assembly of cargo molecules (C14776).

8. Clark BS, Gronostajski RE, and **Blackshaw S**. Efficient generation of retinal photoreceptors from stem/progenitor cells (C15410). Reported 8/2/18.

9. Ling J, and **Blackshaw S**. Using alternative splicing to control specificity of gene therapy.

Provisional US Patent PCT/US20/56156. Filed 10/17/20.

10. Yoo S, Duncan L, and **Blackshaw S**. Controlling homeostatic regulatory circuitry in hypothalamus by selective

induction of tanycyte-derived neurogenesis. Provisional US Patent 36406l0015P1, filed 11/2/20.

11. Singh M, Johnston R, Qian J, and **Blackshaw S**. Compositions and methods for cellular component transfer therapy. Provisional US Patent PCT/US2021/057586. Filed 11/1/2021.

12. Singh M, **Blackshaw S**, Johnston R, Liu Y, and Santiago CP. Method of sorting cells for photoreceptor transplantation treatment. Provisional US Patent 63/338,316. Filed 5/4/22.

13. Boeke J, Zhu H, **Blackshaw S,** Eichinger DJ, and Pino I. Methods and systems for generating, validating and using monoclonal antibodies. Provisional US patent PCT/2022/0363712A1. Filed 6/6/22.

14. **Blackshaw S** and Hoang T. Conversion of retinal glia into neurons for cell replacement therapy. Provisional US Patent 63/394,065, filed 8/1/22.

15. Elias LJ, Khoo H, Kroll F, Zhang C, Hur SC, and **Blackshaw S**. JACUZI-SD (Jetting Automated Currents Under Zebrafish to Induce Sleep Deprivation): an automated, high-throughput, minimally stressful approach to sleep depriving larval zebrafish (C18857). Reported 4/2/25.

**Extramural Sponsorship**

**CURRENT:**

6/21/24-6/20/29 Identification of gene regulatory networks controlling temporal patterning in retinal progenitor cells and neurogenic Muller glia.

R01EY036173

NIH/NEI

$1,935,000

Role: PI, 15%

12/10/24-12/9/28 Total Human Eye-allotransplantation Innovation Advancement (THEIA)

 THEA A-012

 ARPA-H

 $1,770,350

Role: Co-PI, 15%

4/01/21 – 3/31/26 Development and function of hypothalamic Lhx6-positive neurons.

R01MH126676

NIH/NIMH

$1,000,000

Role: PI, 10%

9/01/24 – 8/31/26 Identification of molecular and cellular mechanisms regulating sleep need using automated,

selective, and non-stressful mechanisms in larval zebrafish.

Hopkins/OneNeuro Synergy

$150,000

Role: PI, 5%

12/21/20 – 6/30/25 Single vector-mediated reprogramming of Muller glia into early-stage retinal progenitor cells-

Research Collaboration Agreement

AMD-025693

Genentech Corporation

$150,000

Role: PI, 3%

11/1/24-10/31/28 Damage at cell-cell junctions as the underlying cause of CRB1 degeneration.

Foundation Fighting Blindness

$130,312

Role: Co-PI, 2%

9/30/21-7/31/26 Developing photoreceptor repair for macular degeneration therapy.

R01EY033103

NIH/NEI

$1,250,000

Role: co-PI, 3%

6/1/22-5/31/26 The role of epigenetics in RPE heterogeneity with early AMD.

 R01EY033765

NIH/NEI

$1,000,000

Role: co-PI, 5%

2/1/23-1/31/27 Elucidating and bypassing molecular mechanisms that suppress Muller glia-dependent

regeneration of cones in two zebrafish models of chronic retinal damage.

R01EY034493

NIH/NEI

$1,000,000

Role: co-PI (sub), 3%

9/30/22-8/31/25 Innate immune system regulation of retinal regeneration.

R01EY033009

NIH/NEI

$1,250,000

Role: co-PI (sub), 2%

12/21/22-11/30/27 Nanomedicine-based approach for characterizing the epigenome in prevention of inflammation-

induced preterm birth.

R01HD108905

NIH/NICHD

$2,000,000

Role: co-PI, 3%

9/30/23-7/31/27 Elucidating signaling networks in anterior segment development, repair and diseases.

R01EY034493

NIH/NEI

$1,000,000

Role: co-PI (sub), 1%

**PENDING:**

7/01/25-6/30/30 **Reprogramming mammalian Muller glia for photoreceptor replacement.**

R01EY031685

NIH/NEI

$1,820,000

Role: PI, 15%

**COMPLETED:**

7/1/05-6/30/07 Transcriptional regulation of retinal cell fate specification.

 Sloan Scholar Award/ Alfred P. Sloan Foundation

 $80,000

 Role: PI; 5%

7/1/05-6/30/08 The role of non-protein coding, mRNA-like transcripts in mouse retinal development.

 Research Grant/Whitehall Foundation

 $225,000

 Role: PI; 15%

2/1/06-1/30/08 Cell specification and regeneration in mammalian hypothalamus

 Basil O’Connor Starter Scholar

 March of Dimes

 $200,000

 Role: PI; 10%

7/1/06-6/30/09 The molecular basis of cell specification and regeneration in neuroendocrine hypothalamus

 Young Investigators Award

 Klingenstein Fund

 $150,000

 Role: PI; 10%

7/1/06-6/30/11 The molecular basis of retinal cell fate specification.

 WM Keck Distinguished Young Scholar in Medical Research Award /WM Keck Foundation

 $1,000,000

 Role: PI; 20%

 4/1/07-3/31/12 The role of PIAS3 in retinal development.

 R01EY017015

 NIH/NEI

 $1,250,000

 Role: PI

7/1/07-6/30/09 The role of tanycytes in hypothalamic plasticity and regeneration: relevance in molecular mechanisms of depression

 Young Investigators Award

 National Association for Research in Schizophrenia and Depression $60,000

 Role: PI; 5%

7/1/07-6/30/10 Functional analysis of non-protein-coding mutations that lead to age-related macular degeneration.

 Research Award/The Ruth and Milton Steinbach Fund

 $300,000

 Role: PI; 15%

9/1/09-8/31/11 Genetic analysis of hypothalamic tanycyte function

 R21NS067393

 NIH/NINDS

 $275,000

 Role: PI; 10%

 7/1/10-6/30/11 Antigen-microarray validated monoclonal antibody library for analysis of brain-

 expressed transcription factors implicated in human mental illness

 1R41MH088008

 NIH/NIMH

 $125,000

 Role: PI; 5%

12/1/10-12/1/13 Transcriptional regulation of retinal cell specification and differentiation.

 R01EY020560

 NIH/NEI

 $750,000

 Role: PI; 20%

1/13-2/28/15 Mapping the genomic landscape of developmental competence in retina

 1R21EY023448-01

 NIH/NEI

 $243,000

 Role: PI; 10%

10/1/10-9/30/15 Three-Dimensional Atlas Based Gene Expression Mapping in the Developing Mouse Brains. R01NS070909-04

 NIH/NINDS

 $375,000

 Role: PI; 5%

4/1/11-3/31/15 Global analysis of DNA binding preferences of conventional and unconventional DNA binding proteins.

 R01GM076102-03

 NIH/NIGMS

 $170,000

9/1/11-7/31/16 High-throughput generation of monospecific monoclonal antibodies against human transcription factors.

 U54HG006434-03

 NIH/NIHGR

 $1,325,000

 Role: PI; 15%

9/1/15-7/31/18 Intrabody-dependent activation of cell-specific gene expression in CNS

[U01MH109102-01](https://public.era.nih.gov/grantfolder/piAppDetails/genericStatus.do?encryptedParam=WJd-s1iyWZo.ZQiAL1tqovPT2eD2AKStwPCIbweJHoRnMvcfRI4YIvM.)

 NIH/NIMH

 $850,000

 Role: PI; 18%

10/1/12-9/30/18 The role of PIAS3 in retinal development.

 2R01EY017015-07

 NIH/NEI

 $1,000,000

 Role: PI; 18%

11/30/15-12/1/19 The function and regulation of tanycyte-derived hypothalamic neurogenesis.

 [R01DK108230-01](https://public.era.nih.gov/grantfolder/piAppDetails/genericStatus.do?encryptedParam=X8Q_t_oxz3I.OPRDtQ8qjYkYOs2HcV7umHm-UOPmPIF796xQagzV5Wk.)

 NIH/NIDDK

$1,250,000

 Role: PI; 15%

9/1/16-4/30/20 Comparative transcriptomic and epigenomic analyses of Muller glia reprogramming

1U01EY027267-01

NIH/NEI

 $550,000

 Role: PI; 10%

5/15/16 – 2/28/21 Molecular and Cellular Mechanisms Underlying the Circadian Timing of Sleep

 R01NS094571

 NIH/NINDS

 $250,000

 Role: PI; 5%

1/1/14-2/28/22 Transcriptional regulation of retinal cell specification and differentiation.

 R01EY020560-04

 NIH/NEI

 $1,250,000

 Role: PI; 18%

4/01/17-3/31/22 Use of systems pharmacology to prevent rod and cone photoreceptor degeneration

 R24 EY027283-01

NIH/NEI

$650,00

Role: co-PI, 5%

10/01/18-9/30/22 Identifying the mechanism by which Lhx2 and Sox9 control differentiation of retinal pigmented epithelium and Muller glia cells

 Israel Binational Science (Blackshaw)

$160,000

Role: co-PI, 3%

7/1/19-6/30/22 Evaluating subsets of RPE cells affected by macular degeneration

Research Grant

Foundation Fighting Blindness

$300,000

Role: Co-PI, 3%

1/1/20-12/31/21 Photoreceptor replacement in mouse and human by targeted reprogramming of Muller glia.

Stein Innovation Award

Research to Prevent Blindness

$300,000

Role: PI, 10%

 8/01/20 – 7/31/23 Generation of viral vectors that use alternative splicing to drive cell-type specific expression in

the central nervous system

 R01MH123327

 NIH/NIMH

$1,075,000

Role: PI, 10%

 7/01/20 – 6/30/24 Identification of gene regulatory networks that control proliferation and neurogenic competence

in Muller glia

R01EY031685

 NIH/NEI

$1,595,000

Role: PI, 10%

11/1/21-10/31/24 Gene regulatory networks controlling aging and rejuvenation in retinal glia.

 Milky Way Research Foundation

 $2,500,000

 Role: PI, 25%

1/1/21-12/31/23 (NCE) Identifying gene regulatory networks controlling photoreceptor specification by

transcriptomic and epigenomic analysis of retinal development in cone-dominant retina.

R21EY32281

NIH/NEI

$250,000

Role: PI, 2%

**EDUCATIONAL ACTIVITIES**

**Books edited:**

1. Wray SW and **Blackshaw S.** Developmental Neuroendocrinology. Springer Nature, 2020.

**Editorials (not peer-reviewed):**

1. **Blackshaw S,** Livesey FJ. Applying genomic technologies to neural development. Current Opinion in Neurobiology. 2002 6:110-14.

2. **Blackshaw S.** "SAGE" for Ergito.com, Virtual Text, Cambridge, MA 2002.

3. **Blackshaw S,** Cepko C L. Stem cells that know their place, *Nature Neuroscience* 2002 5:1251-2.

4. **Blackshaw S.** We contain multitudes: the protean face of retinoblastoma. *Cancer Cell* 2011 20:137-138.

5. **Blackshaw S.** and Zhu, H. Commercial antibodies: alternative grading for research. *Nature* 2020 586, 500.

6. **Blackshaw S.** and Sanes, JR. Turning lead into gold: reprogramming cells to cure blindness. *J. Clin. Invest*.

2021, 131:e146134.

7. Kim DW and **Blackshaw S**. A super Sonic circadian synchronizer. *Science* 2023, 380:896-897.

8. Soucy JR, et al. (**Blackshaw S** is one of 70+ collaborators). Retinal ganglion cell repopulation for vision restoration in optic neuropathy: a roadmap from the RReSTORe Consotrium. *Mol Neurodegeneration* 2023 18:64.

**Book chapters (not peer-reviewed):**

1. Hwang PM, **Blackshaw S,** Li X-J, Snyder SH. Molecular mechanisms of taste receptor cell signal transduction. In Olfaction and Taste XI, Springer-Verlag, 1994:77-81

2. Cepko CL, **Blackshaw S,** Livesey FJ. A comparison of SAGE and microarray technologies. In DNA microarrays: the new frontier in gene discovery and gene expression analysis. Soc Neuroscience Press 2001.

3. Kim JB, **Blackshaw S.** One-Step Enzymatic Purification of PCR Products for Direct Sequencing. Current Protocols in Human Genetics, Unit 7.13 2001.

4. **Blackshaw S,** Kim JB, St. Croix B, Polyak K. Serial Analysis of Gene Expression. Current Protocols in Human Genetics, Unit 11.6 2001.

5. **Blackshaw S,** Kim, JB, St. Croix B, Polyak K. Serial Analysis of Gene Expression. Current Protocols in Molecular Biology, Unit 25B.6 2002.

6. **Blackshaw S.** "SAGE,” in Encyclopedia of Genetics, Genomics, Proteomics and Bioinformatics, (Quackenbush, J, Little P, eds), John Wiley/ Sons 2005.

**7. Blackshaw S.** “Developmental Genomics,” in Mechanisms of Retinal Development, (Sernagor E, Eglen S, Harris W, Wong R. eds), Cambridge University Press 2006.

8. **Blackshaw S,** Kim JB, St. Croix B, Polyak K. Serial Analysis of Gene Expression. Current Protocols in Molecular Biology, Unit 25B.6 2007.

9. **Blackshaw S,** Kim JB, St. Croix B, Polyak K. Serial Analysis of Gene Expression. Current Protocols in Human Genetics, Unit 11.6 2007.

10. Hu S, Xie Z, **Blackshaw S**, Qian J, Zhu H. Characterization of protein-DNA interactions using protein microarrays. Cold Spring Harb Protoc, 2011 pii.pdb.prot5614.

**Teaching:**

**Classroom instruction**

2004-present Neuroscience and Cognition, 5 lectures (Neurotechniques I, Neurotechniques II, Neural Cell Fate Specification, Hypothalamus I, Hypothalamus II), Johns Hopkins University School of Medicine

2005-2013 Cell and Molecular Biology, 1 lecture (Molecular techniques), Johns Hopkins University School of Medicine

2005-2014 Stem Cells, 1 lecture alternating years (Retinal stem cells), Johns Hopkins University School of Medicine

2005-present Developmental Neuroscience, 1 lecture (Retinal development, Neural induction), Johns Hopkins University School of Medicine

2008-present Neuroscience (BCMB elective), 1 lecture (Neural cell fate determination), Johns Hopkins University School of Medicine

2009-2012 Course organizer, Neuroscience and Cognition I, Johns Hopkins University School of Medicine

2013 Course organizer, The Hypothalamus, 7 lectures, Johns Hopkins University School of Medicine

2013-present Genes to Society: NSS, 1 lecture, Johns Hopkins University School of Medicine

2014 Course organizer, Emerging Strategies in Understanding Innate Behaviors, Johns Hopkins University Kreiger School of Arts and Sciences, 7 lectures.

2008-present Method and Logic (BCMB core class), 2 lectures.

2020-present Developmental Biology, 3 lectures (Early embryonic development and A-P patterning, D-V and L-R patterning, Retinal development)

2021-present Course organizer, Grant Writing Skills, Johns Hopkins University School of Medicine, 7 lectures.

**Mentoring**

**Advisees**

2004-2009 Nicole A. Rapicavoli, PhD, doctoral student. Awarded St Jude Graduate Student Symposium Award under my direction. Currently Vice President of Marketing, S2 Genomics, Livermore, CA.

2005-2009 Akishi Onishi, PhD, postdoctoral fellow. Currently Group Leader (Associate Professor equivalent) at RIKEN-Center for Biodynamics Dynamics Research, Kobe, Japan. Awarded Knights Templar Pediatric Ophthalmology Research Award and A. McGhee Harvey Young Investigator Award under my direction.

2005-2007 Marina Avetisyan, BA/MS student. Currently MSTP student at Washington University, St. Louis.

2005-2007 Alex Huang, MD/PhD student (co-mentored with Dr. Solomon Snyder). Currently Alfred Voight Professor of Ophthalmology, University of California San Diego School of Medicine.

2006-2012 Daniel A. Lee, BS, doctoral student. Awarded NSF predoctoral fellowship. Awarded Sigma Xi Travel Award, RIKEN-BSI Summer Research Fellowship, NRSA graduate fellowship and Paul Erlich Young Investigator Award award under my direction. Currently Program Scientist at Schmidt Futures, New York, NY.

2006-2013 Ana Miranda-Angulo, MD, doctoral student. Currently Professor of Psychiatry, Universidad de Antioquia, Medellin, Colombia.

2006-2016 Jimmy de Melo, PhD, postdoctoral fellow. Currently Principal Scientist at Astellas Institute for Regenerative Medicine, Westborough, MA. Awarded Knights Templar Pediatric Ophthalmology Research Award under my direction.

2007-2012 Erin Poth (Singh), BS, doctoral student. Awarded NSF Asia-Pacific Summer Fellowship, VNTP training grant support, and St Jude Graduate Student Symposium Award under my direction. Currently Head of Global Medical Strategy and Operations at Sanofi, Cambridge, MA.

2007-2014 Eric Cox, BS, doctoral student (co-mentored with Dr. Heng Zhu). Awarded AHA graduate fellowship under my direction. Currently Staff Scientist at RefSeq.

2008-2010 Mardi S. Byerly, PhD, postdoctoral fellow. Currently Professor of Biology, Cape Cod Community College, West Barnstable, MA.

2010-2015 Joseph L. Bedont, BS, doctoral student. Awarded an Alicia Showalter Reynolds Young Investigator award, an NSF graduate fellowship and VNTP training grant support under my direction. Currently Assistant Professor of Biological Sciences, Kent State University, Akron, OH.

2010-2017 Kai Liu, MS, doctoral student. Awarded Mette Strand Young Investigator award. Currently Vice Presient for Artificial Intelligence, SES AI, Woburn, MA.

2011-2016 Thuzar Thein, BS, doctoral student. Currently Investigator at Mass Eye and Ear and Instructor in Ophthalmology, Harvard Medical School.

2011-2017 Cristina Zibetti, PhD, postdoctoral fellow. Currently postdoctoral fellow at the University of Oslo, Norway.

2011-2017 Elizabeth Newman, BS, doctoral student. Currently Program Officer at National Institute of Aging.

2011-2013 Juan Salvatierra, post-baccalaureate PREP student. Currently Scientist at Neurona Therapeutics.

2013-2020 Sooyeon Yoo, PhD, postdoctoral fellow. Awarded Maryland Stem Cell Fund postdoctoral fellowship under my supervision. Currently Research Assistant Professor at Seoul National University Medical School, Seoul, South Korea.

2014-2017 Anand Venkataraman, PhD, postdoctoral fellow. Currently Associate Director, Genetic Engineering and Bioinformatics, Genmab, Plainsboro, NJ.

2014-2018 Brian Clark, PhD, postdoctoral fellow. Awarded an F32 individual research fellowship and a K99/R00 Pathway to Independence award under my direction. Currently Assistant Professor in Departments of Ophthalmology and Developmental Biology at Washington University School of Medicine.

2015-2021 Fatemeh Rajaii, MD, PhD, Retina Rising Associate Professor of Ophthalmology. Research mentor via K08 fellowship.

2016-2023 Dong Won (Thomas) Kim, PhD, postdoctoral fellow. Awarded Maryland Stem Cell Fund postdoctoral fellowship and Paul Ehrlich Young Investigator Award under my supervision. Currently Group Leader/Associate Professor in the DANDRITE unit at Aarhus University, Denmark.

2016-2023 Thanh Hoang, PhD, postdoctoral fellow. Received Helen Taussig Young Investigator Award under my supervision. Currently Assistant Professor of Ophthalmology, Cell and Developmental Biology at the University of Michigan School of Medicine in January, 2023.

2016-2017 Mobolane Abedesin, post-baccalaureate DDP student. Currently MSTP student at Vanderbilt University School of Medicine.

2017-2020 Jonathan Ling, PhD, postdoctoral fellow. Awarded Kavli postdoctoral fellowship and IDIES Seed Fund Program Award. Currently Assistant Professor of Pathology at Johns Hopkins University School of Medicine.

2018-2022 Kurt Weir, BS, PhD student. Awarded VNTP training grant support and an NRSA individual research fellowship under my supervision. Currently EMBL Interdisciplinary Postdoctoral Fellow working with Drs. Eileen Furlong at EMBL-Heidelberg and Miki Ebisuya at EMBL-Barcelona.

2018-present Clayton Santiago, PhD, postdoctoral fellow. Awarded A. McGhee Harvey Young Investigator Award and VNTP training grant support under my supervision.

2018-2025 Parris Washington, BS, PhD student. Received NSF predoctoral fellowship, and was awarded P.E.O. Scholar Award and Schmidt Futures Quad Fellowship under my supervision.

2019-2025 Patrick Leavey, BS, PhD student. Awarded an NRSA individual research fellowship under my supervision.

2019-2020 Changyu Sun, BS, MS student. Currently Neuroscience PhD student at the University of Chicago.

2020-2025 Nicole Panullo, BS, PhD student. Awarded VNTP training grant support and NRSA individual research fellowship under my supervision.

2020-2025 Leighton Duncan, MS, PhD student. Awarded NRSA individual research fellowship, F99/K00 award, and St Jude Graduate Student Symposium Award under my supervision.

2020-present Rogger Carmen, BS, PhD student.

2020-present Vickie Trinh, BS, PhD student. Awarded NRSA individual research fellowship under my supervision.

2020-2022 Megan Gimmen, BS, postbaccalaureate DDP student. Received Samvid Scholar Award under my supervision. Currently medical student at Harvard.

2021-2025 Haley Appel, BS, PhD student.

2021-2025 Nguyet Le, BS, PhD student. Awarded the David Israel Macht Young Investigator Award under my supervision.

2021-2023 Roujin An, BS, MS student. Currently PhD student in Johns Hopkins Biomedical Engineering program.

2022-2025 Isabella Palazzo, PhD, postdoctoral fellow. Awarded NRSA individual research fellowship under my supervision.

2022-2024 Taqdees Gohar, BS, postbaccalaureate DDP student. Currently medical student at Rowan University.

2022-present Leah Elias, PhD, postdoctoral fellow. Awarded Jane Coffin Childs Postdoctoral Fellowship and Hopkins Research Accelerator Award under my supervision.

2022-present Ishrat Ahmed, MD/PhD, Retina Rising Assistant Professor of Ophthalmology at JHMI. Received K12 and FFB Career Development Awards under my supervision.

2022-2024 Bin Yang, PhD, research associate.

2023-present Jared Tangeman, PhD, postdoctoral fellow. Awarded R00, Hopkins Research Accelerator Award, Burroughs-Welcome, and Hanna H. Gray Howard Hughes postdoctoral fellow under my supervision.

2024-present Sangeetha Kandoi, PhD, postdoctoral fellow. Awarded Bright Focus Postdoctoral Research Fellowship and Knights Templar Pediatric Ophthalmology Research Award under my supervision.

2024-present Debarpita Datta, MS, PhD student.

2025-present Shawn Haoxiang Yang, MS, PhD student.

**Undergraduate trainees**

2004-2007 Vani Takiar, JHU undergraduate. Completed dental school at University of Pennsylvania. Pediatric dentist, Hagerstown, MD.

2004-2008 Marina Avetisyan, JHU undergraduate. Completed MD/PhD at Washington University. Currently neurology resident at MGH.

2009 Natalia Klimova, JHU undergraduate.

2010-2012 Ricardo Linares Saldana, JHU undergraduate. Currently MD/PhD student at University of Pennsylvania.

2010-2012 Vanessa Charubhumi, JHU undergraduate. Completed medical school at NYU. Currently orthopedic surgery resident at Cleveland Clinic.

2010-2013 Thomas Pak, JHU undergraduate. Completed MD/PhD at University of Iowa. Currently psychiatry

 resident at UT Southwestern.

2011-2012 Roy Swanson, JHU undergraduate. Completed medical school at Case Western. Currently ophthalmologist in private practice in Tuscon, AZ.

2011-2012 Janie Mesa, JHU undergraduate.

2013-2016 Abhijit Bhathini, JHU undergraduate. Medical student at Drexel College of Medicine.

2014-2016 Felicia Juarez, JHU undergraduate. Research associate at Columbia University.

2014-2017 Yi Stephanie Zhang, JHU undergraduate. Completed medical school at Northwestern. Currently ophthalmology resident at UCSF.

2017-2018 Trisha Parayil, JHU undergraduate. Currently medical student at Boston University.

2016-2018 Erik Aranda-Michel, JHU undergraduate. Completed dental school at University of Idaho. Currently dentist in private practice in Boise, ID.

2016-2018 David Cha, Georgetown undergraduate. Medical student at St. Louis University.

2018-2019 Fion Shiau, JHU undergraduate. PhD student in Department of Systems Biology, Columbia University.

2018-2020 Zoe Wang, JHU undergraduate. Clinical researcher at Gentron Health, Gaithersburg, MD

2018-2020 Sonia Lin, JHU undergraduate. Research associate at Harvard.

2018-2020 David Espinoza, JHU undergraduate. MD/PhD student at Columbia University.

2018-2020 Alex Ma, JHU undergraduate. PhD student in Psychology, George Washington University.

2019 Cristian Saez, UPR-Mayaguez undergraduate. PhD student in Biological Chemistry and Molecular Biology, Johns Hopkins University School of Medicine

2019-2022 David Garib, JHU undergraduate. Medical student at Case Western.

2019-2022 Weina Dai, JHU undergraduate. Masters student in Computer Science at Johns Hopkins.

2019-2022 Natasha Vega, JHU undergraduate.

2020 Craig Washington, Morehouse undergraduate. Masters student in Biology at Georgia State.

2020 Noah Lu, JHU undergraduate.

2022-present Kyra Bowen, JHU undergraduate. Awarded Barry Goldwater Scholarship under my supervision.

2022 Tanushri Bhatnagar, Arizona State undergraduate. Currently research associate at Monell Chemical Science Center.

2022-present Ritvik Pulya, JHU undergraduate. Awarded Provost Undergraduate Research Award under my supervision.

2023 Hy Do, University of Georgia undergraduate.

2024-present Marika Abe, JHU undergraduate. Awarded Provost Undergraduate Research Award under my supervision.

2024-present Mercedes Seymour, Morgan State University undergraduate.

2024-present Ted Chor, JHU undergraduate. Awarded Provost Undergraduate Research Award under my supervision.

**High school trainees**

2018 Manling Chen

2019 Hawa Sidy (currently at University of Maryland)

2020 Naomi Condado (currently at University of Maryland)

2020 Devin Harris

2022 Henry Vo (currently at Yale)

2021-2024 Yehna Kim

2023-2024 Jimmy Navarrete

2023 Alicia Anthony

**Thesis committees**

2004-2009 Nicole A Rapicavoli, PhD, advisor.

2005-2007 Alex Huang, MD PhD, dissertation committee member.

2006-2008 Krishna Juluri, PhD, dissertation committee member.

2006-2012 Daniel A. Lee, BS, advisor.

2006-2013 Ana Miranda-Angulo, MD, advisor.

2007-2012 Lindsay De Baise, BS, dissertation committee member.

2007-2011 Tarran Pierfliece, BA, dissertation committee member.

2008-2012 Erin Poth, BS, advisor.

2008-2014 Eric Cox, BS, advisor.

2008-2011 Priyanka Sabherwal, BS, dissertation committee member.

2008-2012 Alvin Huang, BS, dissertation committee member.

2009-2013 Tracy Huang, BS, dissertation committee member.

2009-2012 Yang Roby, BS, dissertation committee member.

2009-2015 Kylie Chew, BS, dissertation committee member.

2010-2015 Dean Campbell, BA, dissertation committee member.

2010-2015 Erin Golden, BA, dissertation committee member.

2010-2016 Eleftheria Koropouli, MD, dissertation committee member.

2011-2017 Kai Liu, MS, advisor.

2011-2016 Thuzar Thein, BS, advisor.

2011-2017 Elizabeth Newman, BS, advisor.

2011-2013 Sean Byrne, dissertation committee member.

2011-2017 Tanu Sharma, BA, dissertation committee member.

2011-2016 Jessica Houtz, BA, dissertation committee member.

2012-2015 Alisa Mo, BS, dissertation committee member.

2012-2017 Joshua Schwartz, BS, dissertation committee member.

2012-2017 Leonardo Hageman, BS, dissertation committee member.

2013-2017 William Keenan, BA, dissertation committee member.

2014-2018 Yi Zhou, BS, dissertation committee member.

2015-2019 Benjamin Bell, BA, dissertation committee member.

2015-2019 Mateusz Dobrowolski, BA, dissertation committee member.

2015-2019 Erica Boehm, BA, dissertation committee member.

2015-2020 Daniel Ramos, BA, dissertation committee member.

2015-2019 Kiara Eldred, BA, dissertation committee member.

2015-2019 Meenakshi Prajapati, BA, dissertation committee member.

2015-2020 Timour Al-Khindi, BS, dissertation committee member.

2015-2019 Justin Brodie-Kommit, BS, dissertation committee member.

2015-2018 Jonathan Grima, BS, dissertation committee member.

2016-2020 Michael Thomsen, BA, dissertation committee member.

2016-2021 Jonathan Augustin, BS, dissertation committee member.

2017 Daniel Giovanazzo, MS, dissertation committee member.

2017-2022 Nelmari Ruiz Otero, BA, dissertation committee member.

2018-2022 Natalie Hamilton, BS, dissertation committee member.

2018-2021 Sarah Hadiniyak, BA, dissertation committee member.

2018-2021 Thao Phan Phoung, BS, dissertation committee member.

2018-2021 Lisa Learman, BS, dissertation committee member.

2018-2022 Karazyna Hussey, BA, dissertation committee member.

2018-2021 Brian Upton, BS (student at University of Cincinnati), dissertation committee member.

2019-2023 Matthew Brown, BS, dissertation committee member.

2019-2021 Yuqi Tan, BS, dissertation committee member.

2019-2022 Kurt Weir, BS, advisor.

2019-2025t Parris Washington, MS, advisor.

2019-2025 Patrick Leavey, BS, advisor.

2020-2024 Christina McNerney, BA, dissertation committee member.

2020-2025 Jiali Xiong, BA, dissertation committee member.

2020-2024 Daphne Chien, BA, dissertation committee member.

2020-2024 Patrick Cooke, BA, dissertation committee member.

2020-present Michelle Biederman, MS, dissertation committee member.

2020 Guarav Sharma, BS, MS thesis committee member.

2020-present Nicole Panullo, BS, advisor.

2020-2025 Leighton Duncan, MS, advisor

2020-present Rogger Carmen, BS, advisor.

2020-present Vickie Trinh, BS, advisor.

2020-2024 Yiwei Ai, BS, advisor.

2020-2023 Kevin Emmerich, BA, thesis committee member.

2021-present Elijah Blank, BA, thesis committee member.

2021-present Sang Ho Kwon, BA, thesis committee member.

2021-present Haley Appel, BS, advisor.

2021-present Nguyet Le, BS, advisor.

2021-present Erik Nelson, BA, thesis committee member.

2022-present James Kiraly, BS, thesis committee member.

2022-2024 Thomas Garton, BS, thesis committee member.

2023-present Yasmin Padovan Hernandez, BA, thesis committee member.

2023-present Manjari Anant, BS, thesis committee member.

2023-present Chin Patel, BS, thesis committee member.

2023-present Irika Sinha, BS, thesis committee member.

2024-present Yunru Chen, BS, thesis committee member.

2024-present Ryan Palaganas, BS, thesis committee member.

2024-present Catherine Brown, BA, thesis committee member.

2024-present Jimmy Forsmo, BS, thesis committee member.

**Training grant participation**

12/1/07-present Visual Neuroscience Training Grant.

 T32EY07143

 NIH/NEI

 Role: PI; Doctoral and postdoctoral research mentor to trainees studying visual systems development.

**CLINICAL ACTIVITIES none**

**SYSTEMS INNOVATION and QUALITY CONTROL ACTIVITIES none**

**ORGANIZATIONAL ACTIVITIES**

**Institutional Administrative Appointments**

2004-2007 Organizer for Neuroscience seminar series, Department of Neuroscience, Johns Hopkins School of Medicine

2004 Member of Faculty Search Committee, Institute for Cell Engineering, Johns Hopkins School of Medicine

2005-present Member of Graduate Admissions Committee, Department of Neuroscience

2005-present Member of Graduate Admissions Committee, Biological Chemistry and Molecular Biology graduate program.

2008 Member of Faculty Search Committee, Department of Neuroscience, Johns Hopkins School of Medicine

2011-2017 Member of Policy Committee, Biological Chemistry and Molecular Biology graduate program.

2012-2017 Member of Curriculum Review Committee, Biological Chemistry and Molecular Biology graduate program.

2013 Member of Faculty Search Committee for assistant professor candidate, Center for High-Throughput Biology, Johns Hopkins School of Medicine

2014- Scientific Director, Single Cell and Transcriptomics Core Facility (formerly Microarray and Transcriptomics Core Facility), Johns Hopkins University School of Medicine

2021-2022 Member, Young Investigators’ Day Program Review Committee

2022 Member of Faculty Search Committee for assistant professor candidate, Department of Biology, Johns Hopkins University

2024 Member of Faculty Search Committee for Bloomberg assistant professor candidate, Department of Neuroscience, Johns Hopkins University

**Editorial Board Activities**

**Journal Editor:**

2011-present Editorial Board member, *Biomolecules*

2011-present Editorial Board member, *Frontiers of Systems Biology*

2011-present Guest editor,*PNAS*

2011-2024 Guest editor,*PLoS Genetics*

2016-2019 Section editor, *Brain Research.*

2022-present Reviewing editor, *eLife*.

2024-present Reviewing editor, *PLoS Genetics*.

**Invited Reviewer:**

2004-present *Journal of Neuroscience*

2005 *Genome Research*

2005-2007 *Molecular and Cellular Neuroscience*

2005-2008 *Neuroscience*

2005-2008 *Human Molecular Genetics*

2005-present *PLoS Computational Biology*

2005-present *Journal of Comparative Neurology*

2006-present *Nature*

2006 *Current Biology*

2006 *Genome Biology*

2006 *Brain Research*

2006 *Molecular Evolution*,

2007-present *Nature Neuroscience*

2007-present *Developmental Cell*

2007-present *Investigative Ophthalmology and Visual Science*

2007-present *PNAS*

2007-present *Developmental Dynamics*

2008 *BMC Bioinformatics*

2008-present *Biotechniques*

2008-present *Molecular Vision*

2008-present *PLoS Genetics*

2008-present *BMC Developmental Biology*

2009-present *Science*

2009-present *Physiology and Behavior*

2010-present *WIRES Systems Biology and Medicine*

2010-present *EMBO Journal*

2010-present *PLoS ONE*

2010-present *Cerebral Cortex*

2010-present *Neuron*

2010-present *Journal of Neuroendocrinology*

2010-present *Cancer Cell*

2011-present *European Journal of Human Genetics*

2011-present *Trends in Neuroscience*

2011-present *Nature Cell Biology*

2011-present *Genetics*

2012-present *Molecular Endocrinology*

2012-present *Progress in Retinal and Eye Research*

2012-present *Cell and Molecular Life Sciences*

2012-present *Genes and Development*

2012-present *Nature Biotechnology*

2013-present *Gene Expression Patterns*

2013-present *Disease Models and Mechanisms*

2013-present *Trends in Pharmacology and Therapeutics*

2013-present *Trends in Endocrinology and Metabolism*

2013-present *eLife*

2013-present *Psychoneuroendocrinology*

2013-present *Angiogenesis*

2013-present *Stem Cells*

2013-present *Journal of Cellular and Molecular Medicine*

2014-present *Journal of Neuroendocrinology*

2015-present *Science Signaling*

2015-present *Cell Reports*

2017-present *Nature Communications*

2020-present *Cell Genomics*

2020-present *Communications Biology*

2020-present *iScience*

2020-present *Science Advances*

2021-present *Cell Stem Cell*

2022-present *Communications Biology*

2023-present *Current Opinion in Genetics and Development*

**Professional Societies**

2002-present Member, Society for Neuroscience

2004-present Member, Society for Developmental Biology

2012-present Member, Association for Research in Vision and Ophthalmology

**Conference Organizer, Section Chair**

7/10 Session chair, International Society for Eye Research, annual meeting, Montreal, Canada

11/10 Minisymposium organizer “Development of thalamus and hypothalamus: from cell fate specification to circuit formation,” Society for Neuroscience, annual meeting, San Diego, CA

11/11 Nanosymposium chair “Development of motor and sensory systems,” Society for Neuroscience, annual meeting, Washington, DC

11/12 Co-organizer, Human System Biology Conference, Johns Hopkins University School of Medicine, Baltimore, MD

5/14 Session chair, Visual Systems Development Gordon Research Conference, Il Ciocco, Italy

7/14 Symposium organizer “Epigenetics in retinal development and disease,” International Society for Eye Research biannual meeting, San Francisco, CA

9/16 Session organizer, “Retinal Neuroscience and Development”, International Society for Eye Research biannual meeting, Tokyo, Japan

5/17 Co-chair, satellite meeting on “Big Data: Current Status and Future Directions”, American Society for Research in Vision and Ophthalmology, Baltimore, MD

5/18 Vice chair, Visual Systems Development Gordon Research Conference, Il Ciocco, Italy.

8/20 Chair, Visual Systems Development Gordon Research Conference, Waterville Valley, NH (cancelled due to Covid-19).

10/20 Session organizer, “Retinal Neuroscience and Development”, International Society for Eye Research biannual meeting, Buenos Aires, Argentina (cancelled due to Covid-19).

8/22 Chair, Visual Systems Development Gordon Research Conference, Southbridge, MA.

9/25 Co-organizer and Chair, Cell Replacement Strategies in the Visual System: Insights from Development, Fondationa Les Treilles, Les Treilles, France.

**Advisory Committees, Review Groups/Study Sections**

1998 NSF (ad hoc outside reviewer)

2001 Biotechnology and Biological Sciences Research Council (UK) (ad hoc outside reviewer)

2003 NEI (ad hoc outside reviewer)

2005 NIMH – Silvio O. Conte Center for Depression and Circadian Rhythms (study section member)

2010 Science Foundation Ireland, external site visit review for “*On Prevention of Blindness Caused by Degenerative Retinopathies****”*** (Peter Humphries, PI), Trinity College, Dublin, Ireland.

2011 Ad hoc study section member, NIH BDPE Biology and Diseases of the Posterior Eye, mail reviewer.

2012 Ad hoc study section member, NIH BVS Biology of the Visual System, ad hoc reviewer.

2012 Special emphasis study section member, NIH CMBG Cellular and Molecular Biology of Glia, ad hoc reviewer.

2013 Special emphasis study section member, NIH ZRG1 IFCN-Z.

2013-2019 Regular study section member, NIH BVS Biology of the Visual System.

2014-present Scientific advisory board member, Foundation Fighting Blindness Canada.

2014, 2020-21 Special emphasis study section member, NIH BRAIN Initiative.

2014, 2020-21 Special emphasis study section member, NIH BRAIN Initiative.

2018, 2023 Co-chair, Task Group, Ryan Initiative for Macular Research.

2019-2025 Member, Biology and Medicine Panel, Research Grants Council of Hong Kong

2021-present Member, scientific advisory board, Hearing Health Foundation.

2021-present Member, external advisory board, West Virginia University Center for

 Foundational Neuroscience Research and Education.

2021-present Reviewer, Schmidt Future Polymaths program.

2023-present Member, external advisory board, Integrated Training in Vision Science, Washington University School of Medicine, St Louis, MO

**Consultantships and related activities**

2004-2006 Consultant, The Frankel Group

2008-present Founder and Scientific Advisory Board member, CDI Labs, Mayaguez, Puerto Rico

2020-2021 Consultant, Third Rock Ventures

2022 Scientific Advisory Board member, Tenpoint Therapeutics

**RECOGNITION**

**Awards, Honors**

1986 Telluride Association Summer Program Award

1987 National Merit Scholar Award

1991 Phi Beta Kappa

1991 Howard Hughes Medical Institute Predoctoral Fellow

1999 Howard Hughes Medical Institute Fellow of the Life Sciences Research Foundation

2005 Sloan Foundation Research Fellowship

2005 Whitehall Foundation Research Grant

2006 Basil O’Connor Starter Scholar Award, March of Dimes

2006 Klingenstein Foundation Award in the Neurosciences

2006 W. M. Keck Foundation Distinguished Young Scholar in Medical Research Award

2007 NARSAD Young Investigator Award

2007 Ruth and Milton Steinbach Fund Award for Research in Macular Degeneration

2019 Research to Prevent Blindness Stein Innovation Award

2021 Inaugural Milky Way Research Foundation Award for Rejuvenation Research

2022 Beebe Lecturer, Washington University School of Medicine

2022 Keynote speaker, Hypothalamus Gordon Research Conference.

**Invited Talks**

1. 7/14/93 “The molecular basis of mammalian taste transduction”, International Symposium on Smell and Taste (ISOT XI), Sapporo, Japan

2. 5/6/97 “Neuronal nitric oxide synthase:prominent alternative splice forms”, Nitric Oxide Club of Paris, Institute Curie, Paris, France

3. 5/7/97 “Neuronal nitric oxide synthase:prominent alternative splice forms”, CNRS Paris, Universite de Paris 7, Paris, France

4. 6/20/97 “The molecular basis of extraretinal phototransduction”, NSF Center for Biological Timing, University of Virginia, Charlottesville, VA,

5. 4/26/00 “A SAGE analysis of retinal development”, Boston Cancer Genomics Club, Dana-Farber Cancer Institute, Boston, MA

6. 9/20/00 “A SAGE analysis of retinal development”, SAGE 2000 conference, Baltimore, MD

7. 9/26/00 “A SAGE analysis of retinal development”, Dana-Farber Cancer Institute, Boston, MA

8. 11/30/00 “Genomic analysis of retinal development and disease”, European Molecular Biology Laboratory (EMBL), Heidelberg, Germany

9. 5/14/01 “Genomic analysis of pineal-specific gene expression”, AANAT 2001 conference, Arlie, VA

10. 9/4/01 “Genomic analysis of retinal development and disease”, Development and Evolution of the Eye, Les Treilles, France

11. 9/10/01 “Genomic analysis of retinal development and disease”, SAGE 2001 conference, San Diego, CA

12. 9/28/01 “Genomic analysis of retinal development and disease”, Boston Cancer Genomics Club, Dana-Farber Cancer Institute, Boston, MA

13. 2/12/02 “Genomic analysis of light-dependent transcription in mammalin pineal gland”, Pineal Cell Biology Gordon Research Conference, Ventura, CA

14. 3/23/02 “Genomic analysis of retinal development and disease”, Macular Vision Research Foundation, Marina del Rey, CA

15. 8/20/02 “Genomic analysis of retinal development and disease”, Neural Development Gordon Research Conference, Newport, RI

16. 11/15/02 “Genomic analysis of retinal development and disease”, Mental Health Research Institute, University of Michigan, Ann Arbor, MI

17. 1/7/03 “Genomic analysis of retinal development and disease”, Department of Biological Chemistry, University of California, Los Angeles, CA

18. 1/9/03 “Genomic analysis of retinal development and disease”, Institute for Neuroscience, University of Oregon, Eugene, OR

19. 1/13/03 “Genomic analysis of light-dependent transcription in mammalian pineal gland”, Pineal Microarray Workshop, Arlie, VA

20. 1/27/03 “Genomic analysis of retinal development and disease”, McGovern Institute for Brain Research, Massachusetts Institute of Technology, Cambridge, MA

21. 1/30/03 “Genomic analysis of retinal development and disease”, Department of Biology, Columbia University, New York, NY

22. 2/17/03 “Genomic analysis of retinal development and disease”, Departments of Microbiology and Molecular Biology and Department of Cell Biology, Duke University, Durham, NC

23. 2/22/03 “Genomic analysis of retinal development and disease”, Department of Neurobiology, University of Massachusetts School of Medicine, Worcester, MA

24. 2/27/03 “Genomic analysis of retinal development and disease”, High-Throughput Biology Center and Institute for Cell Engineering, Johns Hopkins University School of Medicine, Baltimore, MD

25. 3/3/03 “Genomic analysis of retinal development and disease”, Department of Biochemistry and Biophysics, University of California, San Francisco, CA

26. 3/6/03 “Genomic analysis of retinal development and disease”, Department of Genetics, Stanford University School of Medicine, Palo Alto, CA

27. 3/18/03 “Genomic analysis of retinal development and disease”, Department of Neurobiology and Anatomy, Washington University, Saint Louis, MO

28. 3/21/03 “Genomic analysis of retinal development and disease”, Department of Molecular and Cell Biology, University of California, Berkeley, CA

29. 3/25/03 “Genomic analysis of retinal development and disease”, Marsh Laboratory for Veterinary Medicine, Montana State University, Bozeman, MT

31. 5/11/03 “Genomic analysis of light-dependent transcription in mammalian pineal gland”, Chronobiology Gordon Research Conference, Il Ciocco, Barga, Italy

32. 9/30/04 “Genomic analysis of retinal development and disease”, SAGE 2004 conference, Boston, MA

33. 10/28/04 “Genomic analysis of retinal development and disease”, Department of Biology, Johns Hopkins University, Baltimore, MD

34. 3/7/05 “Genomic analysis of retinal development”, Department of Neurology, Johns Hopkins University School of Medicine, Baltimore, MD

35. 5/2/05 “Genomic analysis of retinal and hypothalamic development”, Carnegie Institute of Embryology, Baltimore, MD

36. 9/19/05 “Functional genomic analysis of retinal development”, Ottawa Health Research Institute, University of Ottawa, Ontario, Canada

37. 9/26/05 “Genomic analysis of retinal and hypothalamic development”, Krasnow Institute for Advanced Study, George Mason University, Fairfax, VA

38. 12/14/05 “Genomic analysis of retinal development”, Osaka Bioscience Institute, Osaka, Japan

39. 2/28/06 “Genomic analysis of retinal development”, Scripps Research Institute, Jupiter, FL

40. 4/7/06 “Genomic analysis of retinal development”, Allen Brain Research Institute, Seattle, WA

41. 6/22/06 “Functional genomics of retinal development”, International IUBMB meeting, Kyoto, Japan

42. 3/30/07 “Functional genomics of retinal development”, University of Utah School of Medicine, Salt Lake City, UT

43. 7/25/07 “Functional genomics of retinal development”, Systems Biology Consortium Meeting, Pennsylvania State University, PA

44. 9/19/07 “Functional genomics of hypothalamic development”, Colorado State University, Colorado Springs, CO (invited by students).

45. 12/18/07 “Pias3 and ERRbeta: key regulators of rod photoreceptor specification and survival”, Wilmer Eye Institute, Johns Hopkins University School of Medicine

46. 3/18/08 “Functional genomics of retinal development”, Oxford University, Oxford, U.K.

47. 4/18/08 “Functional genomics of retinal development”, RIKEN Brain Sciences Institute, Saitama, Japan

48. 4/25/08 “Functional genomics of retinal development” University of Osaka, Osaka, Japan

49. 8/10/08 “Molecular mechanisms of rod photoreceptor specification”, Visual Systems Development Gordon Research Conference, Newport, RI

50. 10/20/08 “Novel mechanisms of transcriptional regulation in retinal cell fate specification.” Department of Neurology, Johns Hopkins University School of Medicine, Baltimore, MD

51. 4/14/09 “Unconventional transcriptional regulation and vertebrate neuronal cell fate specification”, RIKEN Brain Sciences Institute, Saitama, Japan

52. 6/14/09 “Molecular mechanisms of rod photoreceptor specification”, Biology and Chemistry of Vision, FASEB Summer Research Conference, Snowmass, CO

53. 9/24/09 “Profiling the Human Protein-DNA Interactome Reveals MAPK1 as a Transcriptional Repressor of Interferon Signaling”, 3rd Annual Young Investigators in Genomics and Bioinformatics Symposium, Johns Hopkins University School of Medicine, Baltimore, MD

54. 11/6/09 “Molecular pathways regulating retinal differentiation and disease”, University of Tokyo, Tokyo, Japan

55. 11/10/09 “Molecular pathways regulating photoreceptor differentiation and disease”, for Retina: Neural Stem Cells and Photoreceptor Degeneration, Okinawa Institute of Science and Technology, Okinawa, Japan.

56. 11/24/09 “Molecular pathways regulating retinal differentiation and disease”, Department of Biological Chemistry, Johns Hopkins University School of Medicine, Baltimore, MD

57. 12/3/09 “Molecular pathways regulating retinal differentiation and disease”, Dean A. McGee Eye Institute, University of Oklahoma School of Medicine

58. 5/10/10 “Neural differentiation: a search for the brains behind the operation”, Computational Genomics interest group, Johns Hopkins University School of Medicine

59. 5/17/10 “Molecular mechanisms of neural specification in embryonic and postnatal hypothalamus”, Department of Neurology, Johns Hopkins University School of Medicine

60. 6/3/10 “Molecular mechanisms of cell specification and regeneration in mammalian hypothalamus”, Department of Neurology Grand Rounds, Albert Einstein School of Medicine, New York, NY

61. 7/10/10 “High-throughput approaches to analyzing hypothalamic development”, 8th International Aegean Conference on Pathways, Networks and Systems Medicine, Rhodes, Greece

62. 7/23/10 “Molecular mechanisms of retinal cell fate specification”, 19th Biannual Meeting of the International Society for Eye Research, Montreal, Quebec

63. 7/26/10 “Transcriptional control of retinal cell fate specification”, McGill University, Montreal, Quebec

64. 9/1/10 “Molecular mechanisms of cell specification and regeneration in mammalian hypothalamus”, Department of Neuroscience, Albert Einstein School of Medicine, New York, NY

65. 11/8/10 “Molecular mechanisms of cell specification and regeneration in mammalian hypothalamus”, Department of Neurology, Northwestern University School of Medicine, Chicago, IL

66. 1/12/11 “Molecular mechanisms of cell specification and regeneration in mammalian hypothalamus”, Department of Psychiatry, Johns Hopkins University School of Medicine, Baltimore, MD

67. 2/07/11 “Molecular pathways regulating photoreceptor differentiation and disease”, Program in Neuroscience, University of Illinois, Urbana, IL

68. 3/23/11 “Transcriptional regulation of photoreceptor specification and survival”, National Eye Institute, Bethesda, MD

69. 3/31/11 “How to build a mammalian retina”, Department of Ophthalmology and Visual Science, Washington University, St. Louis, MO

70. 5/2/11 “Control of retinal differentiation by long noncoding RNAs”, American Society for Research in Vision and Ophthalmology, Fort Lauderdale, FL

71. 5/13/11 “How to build a mammalian hypothalamus”, RIKEN Brain Sciences Institute, Saitama, Japan

72. 5/16/11 “Transcriptional control of retinal cell fate specification”, Department of Biological Sciences, KAIST, Daejon, South Korea

73. 5/17/11 “How to build a mammalian hypothalamus”, Department of Biological Sciences, GIST, Gwangju, South Korea

74. 5/18/11 “How to build a mammalian hypothalamus”, Annual Meeting of Korean Society of Biochemistry and Molecular Biology, Seoul, South Korea

75. 10/12/11 “Transcriptional control of retinal cell fate specification”, Medical College of Wisconsin, Milwaukee, WI

76. 10/17/11 “How to build a mammalian hypothalamus”, Department of Pharmacology, University of Pennsylvania School of Medicine, Philadelphia, PA

77. 4/2/12 “Long noncoding RNAs in retinal development”, Keystone Symposium on Noncoding RNAs, Snowmass, CO

78. 6/7/12 “Radial glia in health and disease”, Nationwide Children’s Hospital, Columbus, OH

79. 8/22/12 “Transcriptional control of retinal glial development and function”, Visual Systems Development Gordon Research Conference, New London, NH.

80. 9/12/12 “The blueprint of behavior: assembling the mammalian hypothalamus”, NIDDK, NIH, Bethesda, MD

81. 12/6/12 “The blueprint of behavior: assembling the mammalian hypothalamus”, Diabetes Research Center, UCSF, San Francisco, CA

82. 4/5/13 “Radial glia in health and disease”, Department of Pharmacology, Case Western Reserve University, Cleveland, OH.

83. 4/12/13 “Muller glia and tanycytes in health and disease”, NICHD, NIH, Bethesda, MD

84. 4/12/13 “The blueprint of behavior: assembling the mammalian hypothalamus”, Endocrine Grand Rounds, NIH, Bethesda, MD

85. 4/26/13 “Muller glia and tanycytes in health and disease”, Department of Cell and Systems Biology, University of Toronto, Toronto, Canada.

86. 5/3/13 “Muller glia and tanycytes in health and disease”, Department of Genetics, Development and Cell Biology, Iowa State University, Ames, IA.

87. 5/8/13 “Muller glia and tanycytes in health and disease”, Center for Neural Repair and Rehabilitation, Temple University School of Medicine, Philadelphia, PA.

88. 6/16/13 “Dietary regulation of postnatal hypothalamic neurogenesis”, Annual Meeting of the Endocrine Society, San Francisco, CA.

89. 7/30/13 “Lhx2 is a competence factor for Notch-dependent regulation of retinal gliogenesis”, RIKEN-Brain Science Institute, Wako, Saitama, Japan

90. 7/31/13 “Lhx2 is a competence factor for Notch-dependent regulation of retinal gliogenesis”, University of Tokyo, Tokyo, Japan.

91. 8/5/13 “Lhx2 is a competence factor for Notch-dependent regulation of retinal gliogenesis”, Japanese Vision Forum, Ritsumeikan University, Shiga, Japan.

92. 2/6/14 “How Lhx2 builds and protects the retina”, Tata Institute of Fundamental Research, Mumbai, India.

93. 2/7/14 “Dietary regulation of postnatal hypothalamic neurogenesis”, “Adult Neurogenesis: From Stem Cells to Therapies”, Tata Institute of Fundamental Research, Mumbai, India.

94. 2/10/14 “The blueprint of behavior: assembling the mammalian hypothalamus”, Indian Institute of Technology, Kanpur, India.

95. 3/27/14 “How Lhx2 builds and protects the retina”, New York Medical College, Valhalla, NY.

96. 5/2/14 “Retinal nuclear hormone receptors and the Human Protein Capture Reagent Initiative”, American Society for Research in Vision and Ophthalmology, Orlando, FL

97. 6/1/14 “The blueprint of behavior: assembling the mammalian hypothalamus”, Technion, Haifa, Israel.

98. 6/2/14 “The blueprint of behavior: assembling the mammalian hypothalamus”, Tel Aviv University, Tel Aviv, Israel.

99. 7/9/14 “Functional genomics of retinal cell specification”, Sunnybrook Research Institute, University of Toronto, Toronto, Canada.

100. 7/22/14 “Control of retinal Notch signaling and gliogenic competence by Lhx2”, 21st Biannual Meeting of the International Society for Eye Research, San Francisco, CA.

101. 8/22/14 “Systems biology of retinal cell specification”, University of Edinburgh, Edinburgh, UK.

102. 9/12/14 “Hypothalamic development and postnatal neurogenesis”, European Neuroendocrine Association annual meeting, Sofia, Bulgaria.

103. 10/2/14 “Radial glia in health and disease”, Department of Neuroscience, University of North Carolina, Chapel Hill, NC.

104. 11/14/14 “Epigenetic regulation of retinal cell fate specification”, Neuroepigenetics Satellite Meeting, Arlington, VA.

105. 12/9/14 “From the proteome to the mAbome”, Antibody Engineering and Therapeutics Annual Meeting, Huntington Beach, CA.

106. 3/4/15 “How do transcription factors regulate both pluripotency and lineage commitment in retinal progenitors?”, Center for Advanced Biotechnology and Medicine, Rutgers University, New Brunswick, NJ.

107. 5/4/15 “How do transcription factors regulate both pluripotency and lineage commitment in retinal progenitors?”, American Society for Research in Vision and Ophthalmology, Denver, CO.

108. 6/19/15 “Control of retinal development by long noncoding RNAs”, FASEB Meeting on Photoreceptor Biology, Big Sky, MT.

109. 9/29/15 “Genetic control of hypothalamic development”, Janelia Hypothalamus meeting, Howard Hughes Medical Institute, Janelia Farm, VA.

110. 12/7/15 “Hypothalamic development and postnatal neurogenesis”, Fondation IPSEN, Paris, France.

111. 1/11/16 “Transcriptional regulation of retinal cell identity”, Wilmer Eye Institute, Johns Hopkins University School of Medicine, Baltimore, MD.

112. 1/27/16 Loris and David Rich Lecture, “Transcriptional regulation of retinal cell identity”, Department of Ophthalmology, University of Alabama, Birmingham, AL.

113. 2/12/16 “Transcriptional regulation of retinal cell identity”, Jules Stein Eye Institute, University of California Los Angeles School of Medicine, Los Angeles, CA.

114. 3/9/16 “How do transcription factors regulate both pluripotency and lineage commitment in retinal progenitors?”, Department of Neurobiology, University of Connecticut, Stoors, CT.

115. 4/12/16 “Transcriptional regulation of retinal cell identity”, Department of Neuroscience, University of Illinois, Urbana, IL.

116. 4/21/16 “Transcriptional regulation of retinal cell identity”, Department of Ophthalmology, Columbia University School of Medicine, New York, NY.

117. 5/3/15 “Transcriptional and epigenetic control of retinal cell identity”, American Society for Research in Vision and Ophthalmology, Seattle, WA.

118. 5/15/16 “Genetic control of hypothalamic development”, Cold Spring Harbor Asia conference on Neural Development, Suzhou, China.

119. 5/20/16 “Genetic control of hypothalamic development”, Chinese Academy of Sciences, Shanghai, China.

120. 8/7/16 “Genomic mechanisms controlling retinal progenitor cell developmental competence”, Visual Systems Development Gordon Research Conference, Mount Snow, VT

121. 9/19/16 “Genomic mechanisms controlling retinal progenitor cell developmental competence”,

 University of Tokyo, Tokyo, Japan.

122. 9/21/16 “Genomic mechanisms controlling retinal progenitor cell developmental competence”,

 Ritsumeikan University, Shiga, Japan.

123. 9/28/16 “Transcriptional and epigenetic mechanisms controlling Muller glial lineage commitment”, 22nd Biannual Meeting of the International Society for Eye Research, Tokyo, Japan.

124. 10/2/16 “Genetic control of hypothalamic development”, Department of Biological Sciences, KAIST, Daejon, South Korea

125. 11/30/16 “Transcriptional regulation of retinal cell identity”, University of Indiana School of Medicine, Indianapolis, IN.

126. 1/31/17 “Transcriptional regulation of retinal cell identity”, Baylor College of Medicine, Houston, TX.

127. 2/15/17 “Functional genomics of retinal development”, University of Florida School of Medicine, Gainesville, FL.

128. 4/1/17 “Intrabody-mediated control of gene expression in wildtype CNS cells”, Mayo Clinic, Rochester, MN.

129. 4/27/17 “Transcriptional regulation of retinal cell identity”, Distinguished Lecture Series Program, Cole Eye Institute, Cleveland, OH.

130. 5/2/17 (Keynote Speaker) “Single-cell RNA-Seq analysis and retinal development”, Johns Hopkins School of Medicine Annual Genetics Core Facility Research Symposium, Baltimore, MD.

131. 5/7/17 “Single-cell RNA-Seq analysis and retinal development”, in Big Data: Current Status and Future Directions, Satellite Meeting, American Society for Research in Vision and Ophthalmology, Baltimore, MD.

132. 7/11/17 “Specification and function of mammalian retinal glia”, National Institute of Health, Bethesda, MD.

133. 10/1/17 “Transcriptional regulation of hypothalamic cell identity”, 11th Pituitary and Hypothalamus Workshop, Jerez de la Frontera, Spain.

134. 3/1/18 “Transcriptional regulation of retinal cell identity”, Frontiers in Visual Science Lecture, Bascom Eye Institute, Miami, FL.

135. 3/18/18 “Transcriptional regulation of hypothalamic cell identity”, Annual Meeting of the Endocrine Society, Chicago, IL.

136. 4/3/18 “Transcriptional regulation of retinal cell identity”, Department of Ophthalmology, State University of New York, Buffalo, NY.

137. 6/2/18 “Development of hypothalamic Lhx6-positive neurons”, Annual Meeting of the Associated Professional Sleep Societies, Baltimore, MD.

138. 9/7/18 “Control of hypothalamic cell fate specification”, Center for Craniofacial and Regenerative Biology, Kings College, University of London, U.K.

139. 9/10/18 “Building the retina one cell at a time”, 23rd Biannual Meeting of the International Society for Eye Research, Belfast, Northern Ireland.

140. 9/15/18 “Control of hypothalamic cell fate specification”, Circadian Biology Research Group, University of Manchester, Manchester, U.K.

141. 9/17/18 “Control of hypothalamic cell fate specification”, Department of Developmental Biology, University of Sheffield, Sheffield U.K.

142. 9/18/18 “Control of hypothalamic cell fate specification”, Institute of Metabolic Sciences, Cambridge University, Cambridge, U.K.

143. 11/1/18 “Building the retina and hypothalamus: from genes to cells to behavior”, Department of Neuroscience, University of California, San Francisco, CA.

144. 11/9/18 “Hypothalamic development: one cell at a time”, 12th Pituitary and Hypothalamus Workshop, Tepoztlan, Mexico.

145. 12/13/18 “Building the retina and hypothalamus: from genes to cells to behavior”, Friedman Brian Institute, Icahn School of Medicine at Mount Sinai, New York, NY.

146. 1/9/19 “Building and rebuilding the retina one cell at a time”, Department of Ophthalmology, University of Pittsburgh, Pittsburgh, PA.

147. 2/5/19 “Building and rebuilding the retina one cell at a time”, Department of Biological Sciences, University of Notre Dame, South Bend, IN.

148. 2/22/19 “Building and rebuilding the retina one cell at a time”, Integrated Biomedical Sciences Seminar Series, University of California, Davis, CA.

149. 3/12/19 “Building and rebuilding the retina one cell at a time”, Integrated Biomedical Sciences Seminar Series, University of California, Irvine CA.

150. 5/2/19 “Building and rebuilding the retina one cell at a time”, American Society for Research in Vision and Ophthalmology, Vancouver, Canada.

151. 7/25/19 “Building and rebuilding the retina and hypothalamus one cell at a time”, Center for Developmental Biology-RIKEN, Kobe, Japan.

152. 7/26/19 “Building and rebuilding the retina one cell at a time”, Asia-Pacific Conference on Vision, Osaka, Japan.

153. 8/4/19 “Building and rebuilding the retina one cell at a time”, Zhongshan Ophthalmologic Center, Sun Yat Sen University, Guangzhou, China.

154. 9/5/19 “Building the retina and hypothalamus: from genes to cells to behavior”, Department of Physiology, University of California, Irvine, CA.

155. 9/19/19 “Building and rebuilding the retina one cell at a time”, Department of Biological Sciences, KAIST, Daejon, South Korea.

156. 9/24/19 “Control of hypothalamic cell fate specification”, International Brain Research Organization annual meeting, Daegu, South Korea.

157. 10/8/19 “Control of hypothalamic cell fate specification”, Department of Human Genetics, University of Michigan School of Medicine, Ann Arbor, MI.

158. 10/17/19 “Building the retina one cell at a time”, National Eye Institute, National Institutes of Health, Bethesda, MD.

159. 10/31/19 “Building the retina and hypothalamus: from genes to cells to behavior”, Wu Tsai Neurosciences Institute, Stanford University, Palo Alto, CA.

160. 11/2/19 “Building the retina one cell at a time”, “Eye Development and Disease: Pax6 and beyond”, University of Virginia, Charlottesville, VA

161. 11/11/19 “Building and rebuilding the retina one cell at a time”, Okinawa Institute of Science and Technology, Okinawa, Japan.

162. 11/15/19 “Building and rebuilding the retina one cell at a time”, University of Tokyo, Tokyo, Japan.

163. 12/5/19 “Building and rebuilding the hypothalamus one cell at a time”, Department of Neuroscience, University of Texas Southwestern School of Medicine, Dallas, TX.

164. 1/13/20 “Building and rebuilding the retina one cell at a time”, Department of Neurobiology, Ohio State University, Columbus, OH.

165. 1/31/20 “Building and rebuilding the retina one cell at a time”, Genentech, South San Francisco, CA.

166. 2/17/20 “Building and rebuilding the retina one cell at a time”, Department of Ophthalmology, Northwestern University School of Medicine, Chicago, IL.

167. 4/1/20 (postponed due to COVID-19) “Building and rebuilding the retina one cell at a time”, Conference on 3D Hybrid Organotypic Systems, Karlsruhe Institute of Technology, Germany.

168. 4/4/20 (cancelled due to COVID-19) “Building and rebuilding the retina one cell at a time”, Gavin Herbert Eye Institute Bench to Bedside Symposium, University of California, Irvine, CA.

169. 4/16/20 (postponed due to COVID-19) “Building and rebuilding the retina one cell at a time”, 5th annual David. C. Beebe Lecture, Department of Ophthalmology, Washington University School of Medicine, St. Louis, MO.

170. 4/23/19 (cancelled due to COVID-19) “Building and rebuilding the hypothalamus one cell at a time”, Department of Neuroscience, University at Buffalo, Buffalo, NY.

171. 5/3/20 (cancelled due to COVID-19) “Building and rebuilding the retina one cell at a time”. ARVO-China workshop, American Society for Research in Vision and Ophthalmology, Baltimore, MD.

172. 5/3/20 (cancelled due to COVID-19) “Single cell transcriptomics and epigenomics identifies genes regulatory networks controlling retinal cell differentiation”, Special Interest group on Application of Single Cell Genomic Technology, American Society for Research in Vision and Ophthalmology, Baltimore, MD.

173. 5/5/20 (cancelled due to COVID-19) “Single cell transcriptomics and epigenomics identifies genes regulatory networks controlling retinal cell differentiation”, American Society for Research in Vision and Ophthalmology, Baltimore, MD.

174. 5/7/20 (cancelled due to COVID-19) “Single cell transcriptomics and epigenomics identifies genes regulatory networks controlling retinal regeneration”, Special Interest Group on Deciphering the Landscape of Retinal Regeneration and Degeneration using Single-Cell Genomics, American Society for Research in Vision and Ophthalmology, Baltimore, MD.

175. 5/29/20 (postponed due to COVID-19) “Single cell transcriptomics and epigenomics identifies genes regulatory networks controlling retinal regeneration”, Janet and Donald Rowley Biological Sciences Honors Symposium, University of Chicago, Chicago, IL.

176. 6/2/20 (converted to virtual meeting due to COVID-19) “Gene regulatory networks that guide the development of hypothalamic neural circuitry controlling circadian rhythms and sleep”. Society for Research in Biological Rhythms, Amelia Island, FL.

177. 7/31/20 (converted to virtual meeting due to COVID-19) “Building and rebuilding the retina one cell at a time”, Japanese Neuroscience Society Meeting, Kobe, Japan.

178. 8/3/20 (postponed due to COVID-19) “Building the retina and hypothalamus: from genes to cells to behavior”, Department of Neurobiology, Kyoto University, Kyoto, Japan.

179. 10/28/20 (cancelled due to COVID-19) “Building and rebuilding the retina one cell at a time”, 24th Biannual Meeting of the International Society for Eye Research, Buenos Aires, Argentina.

180. 1/11/20 “Building and rebuilding the retina one cell at a time”, Department of Cellular and Molecular Medicine, University of Ottawa, Canada.

182. 3/2/21 “Building and rebuilding the retina one cell at a time”, Conference on 3D Hybrid Organotypic Systems, Karlsruhe Institute of Technology, Germany.

181. 4/8/21 “ Building and remodeling the hypothalamus: from genes to circuits to behavior”, International Institute of Molecular and Cell Biology, Warsaw, Poland.

182. 4/20/21 “Building the retina and hypothalamus: from genes to cells to behavior”, Columbia Neuroscience Seminar Series, Columbia University, Columbia, NY.

183. 4/27/21 “Building and rebuilding the hypothalamus one cell at a time”, Department of Neuroscience, University at Buffalo, Buffalo, NY.

184. 5/2/21 “Control of neurogenic competence in retinal Muller glia”, American Society for Research in Vision

and Ophthalmology, (held virtually in 2021).

185. 5/3/21 “Comprehensive analysis of retinal development at single cell resolution”,

American Society for Research in Vision and Ophthalmology, (held virtually in 2021).

186. 5/5/21 “Single cell transcriptomics and epigenomics identifies genes regulatory networks controlling retinal cell differentiation”, American Society for Research in Vision and Ophthalmology, (held virtually in 2021).

187. 5/21/21 “Control of neurogenic competence in retina Muller glia cells”, Korean Society of Brain

and Neural Sciences (KSBNS), Seoul, South Korea.

188. 5/28/21 “Building and rebuilding the hypothalamus one cell at a time”, Danish Single Cell Biology

Interest Group, University of Copenhagen, Denmark.

189. 9/8/21 “Building and rebuilding the retina and hypothalamus one cell at a time”, Department of Cell and Developmental Biology, University of Illinois, Urbana-Champaign, IL.

190. 10/8/21 “Building and rebuilding the retina one cell at a time”, Hearing Research Foundation (virtual)

191. 11/6/21 “Building and rebuilding the retina one cell at a time”, 2nd Aniridia meeting, University of Virginia, Charlottesville, VA.

192. 11/18/21 “Development of hypothalamic circuitry controlling sleep and circadian timing” (keynote address), Sleep and Neurodevelopment Workshop, Baylor University School of Medicine Neurological Research Institute/NIH (virtual meeting).

193. 12/13/21 “Building and rebuilding the retina one cell at a time”, VisoNYC (joint vision-related training program of Columbia, Cornell, NYU, and SUNY), New York, NY.

193. 1/12/22 “Building and rebuilding the retina one cell at a time”, University of Alabama, Birmingham, AL.

194. 1/26/22 “Building and rebuilding the retina one cell at a time”, University College, London, U.K.

195. 2/8/22 “Building and rebuilding the retina one cell at a time”, Department of Molecular and Human Genetics, Baylor University School of Medicine, Houston, TX.

196. 2/28/22 “Development of hypothalamic circuitry controlling sleep and circadian timing”, Sleep Research Seminar, Department of Medicine, Johns Hopkins University School of Medicine, Baltimore, MD.

197. 3/28/22 “Building and rebuilding the retina one cell at a time”, Department of Neuroscience, Scripps

Research Institute, San Diego, CA.

198. 3/28/22 “Integrated multiomic analysis identifies gene regulatory networks controlling retinal

development”, 2022 RIMR meeting, Beckman Center, Irvine CA.

199. 4/22/22 “Building and rebuilding the retina and hypothalamus one cell at a time”, Endocrine Grand

Rounds, Beth-Israel Deaconess Hospital, Boston, MA.

200. 5/18/22 “Building and rebuilding the retina one cell at a time”, Czech Academy of Sciences, Prague,

Czech Republic.

201. 5/19/22 “Building and rebuilding the retina one cell at a time”, Center for Molecular and

Cellular Bioengineering, Technische Universität Dresden, Dresden, Germany.

202. 5/23/22 “Building and rebuilding the retina one cell at a time”, University of Heidelberg, Heidelberg,

Germany.

203. 6/30/22 “Gene regulatory networks controlling neurogenic competence in glia”, University College, London, U.K.

204. 7/8/22 “Gene regulatory networks inhibiting neurogenic competence in glia”,

*Cajal’s challenge accepted: Sharpening the toolbox for in vivo cell fate conversion,* FENS 2022 satellite symposium, Paris, France***.***

205. 7/26/22 “Building the hypothalamus: from form to function”, (keynote address),

Hypothalamus Gordon Research Conference, Ventura, CA.

206. 8/1/22 “Gene regulatory networks controlling neurogenic competence in glia”, Genentech, South Francisco, CA.

207. 9/8/22 “Building and rebuilding the retina one cell at a time”, 5th annual David. C. Beebe Lecture, Department of Ophthalmology, Washington University School of Medicine, St. Louis, MO.

208. 10/3/22 “Gene regulatory networks controlling neurogenic competence in glia”, Neuro Zoom (Host: Aaron Gitler).

209. 10/18/22 “Building and rebuilding the retina one cell at a time”, Burke Neurological Institute of Cornell University, White Plains, NY.

210. 12/3/22 “Building and rebuilding the retina one cell at a time”, Baylor College of Medicine Vision Research Symposium 2022, Houston, TX.

211. 2/22/23 “Gene regulatory networks controlling retinal glial fibrosis”, 24th Biannual Meeting of the International Society for Eye Research, Gold Coast, Australia.

212. 4/12/23 “Molecular mechanisms controlling species-specific aspects of neural development and regeneration”. Stowers Institute, Kansas City, MO (invited by students and postdocs).

213. 5/2/23 “Building and rebuilding the retina one cell at a time” (keynote and Kavli Distinguished Speaker), Brain and Behavior Institute seed grant symposium, University of Maryland, College Park, MD.

214. 5/10/23 “Building and rebuilding the retina one cell at a time” (plenary lecture), Inaugural Symposium, Paris-Saclay University, Paris, France.

215. 6/8/23 “Gene regulatory networks controlling retinal and hypothalamic neurogenesis”, Hong Kong

Baptist University, Hong Kong.

216. 6/9/23 “Gene regulatory networks controlling retinal regeneration”, Hong Kong City University, Hong

Kong.

217. 6/15/23 “Control of neurogenic competence in mammalian hypothalamic tanycytes”, ENDO2023, Chicago, IL.

218. 6/30/23 “Building the hypothalamus: from form to function” (keynote lecture), Symposium on Hypothalamic Development, University of Copenhagen, Denmark.

219. 7/4/23 “Building the hypothalamus: from form to function”, International Institute of Molecular and Cell Biology, Warsaw, Poland.

220. 7/8/23 “Gene regulatory networks controlling retinal regeneration”, XVI European Meeting on

Glial Cell Function in Health and Disease, Berlin, Germany.

221. 9/15/23 “Cell type and state-specific targeting of gene therapy vectors using splicing-dependent

frameshifting”, Wilmer Eye Center, Johns Hopkins University School of Medicine, Baltimore, MD.

222. 9/22/23 “Gene regulatory networks controlling neural regeneration”, Krembil Research Institute,

University of Toronto, Toronto, Canada.

223. 9/26/23 “Regenerating the retina and hypothalamus”, Ottawa Health Research Institute, Ottawa, Canada.

224. 9/30/23 “How the retina knows what time it is”, 3rd Aniridia meeting: “Pax6 and

beyond”, University of Virginia, Charlottesville, VA

225. 10/5/23 “Regenerating the retina”, Department of Ophthalmology, University of Louisville School of

Medicine, Louisville, KY.

226. 10/6/23 “Gene regulatory networks controlling retinal regeneration and aging”, Department of

Biology, University of Louisville, Louisville, KY.

227. 10/12/23 “Gene regulatory networks controlling retinal aging”, 4th Interventions in

Aging Conference, Dubrovnik, Croatia.

228. 11/3/23 “Gene regulatory networks controlling retinal regeneration”, KAIST, Daejon, South Korea.

229. 11/7/23 “Gene regulatory networks controlling retinal regeneration”, Korean Society for Molecular

and Cell Biology, Jeju, South Korea.

230. 11/9/23 “Gene regulatory networks controlling retinal regeneration”, Yonsei University, Seoul, South

Korea.

231. 1/11/24 “The retina in time: development, regeneration, and aging viewed through the single-cell lens”,

Department of Ophthalmology, University of Texas Southwestern, Dallas, TX.

232. 1/25/24 “Gene regulatory networks controlling retinal regeneration”, Department of Biology, Florida

State University, Tallahassee, FL (invited by students).

233. 2/12/24 “Gene regulatory networks controlling retinal development and regeneration”, Department of

Neurobiology, University of Southern California, Los Angeles, CA.

234. 4/18/24 “Gene regulatory networks controlling retinal development and regeneration”, Department of

Neurobiology, Augusta University, Augusta, GA.

235. 5/22/24 “Retinal gene regulatory networks controlling cellular aging”, Visual System Development

Gordon Research Conference, Il Ciocco, Barga, Italy.

236. 5/27/24 “Gene regulatory networks controlling vertebrate retinal regeneration”, Institute of Molecular

Pathology, Vienna, Austria.

237. 6/12/24 “Gene regulatory networks controlling vertebrate retinal regeneration”, Academia Sinica, Taipei,

Taiwan.

238. 6/14/24 “Gene regulatory networks controlling vertebrate retinal regeneration”, Hong Kong University

of Science and Technology, Hong Kong.

239. 9/11/24 “Gene regulatory networks controlling vertebrate retinal regeneration”, Cellular Ecosystems in

CNS injury and repair Symposium, Karolinska Institute, Stockholm, Sweden.

240. 9/12/24 “Building and regenerating the retina”, Karolinska Institute, Stockholm, Sweden.

241. 10/14/24 “Constructing the hypothalamus, from form to function”, “Developmental

Specification of Complex Behaviors” meeting, Janelia Conference Center, Ashburn, VA.

242. 10/17/24 “Building and regenerating the retina”, keynote presentation, Focus on Fellows Symposium,

National Eye Institute, Bethesda, MD.

243. 10/22/24 “Gene regulatory networks controlling retinal regeneration”, International Society for Eye

Research biannual meeting, Buenos Aires, Argentina.

244. 11/7/24 “Gene regulatory networks controlling retinal development and regeneration”, Bioinformatics

Training and Education Program Distinguished Speakers Seminar Series, National Cancer Institute, NIH, Bethesda, MD.

245. 12/3/24 “Gene regulatory networks controlling neural development and regeneration”, University of

Georgia, Athens, GA.

246. 12/12/24 “Gene regulatory networks controlling neural development and regeneration”, Retinal Research

Foundation Seminar Series, Baylor College of Medicine, Houston, TX.

247. 1/7/25 “The retina in time: a single-cell view of development, regeneration, and aging”,

Single Cell Interest Group, Johns Hopkins University School of Medicine, Baltimore, MD.

248. 2/10/25 “Constructing the hypothalamus, from form to function”, Cold Spring Harbor Laboratories, Cold Spring

Harbor, NY.

249. 4/23/25 “The retina in time: a single-cell view of development, regeneration, and aging”,

Department of Neurobiology, University of Toronto, Toronto, Canada.

250. 7/14/25 (invited) “Constructing the hypothalamus, from form to function”, Center for Hypothalamus Research,

University of Texas Southwestern, Dallas, TX.

251. 9/2/25 (invited) “Gene regulatory networks controlling retinal development and regeneration”, Cell Replacement Strategies in the Visual System: Insights from Development, Les Treilles, France.

252. 10/27/25 (invited) “Gene regulatory networks controlling retinal development and regeneration”, IRCM, Montreal, Quebec.

252. 11/3/25 (invited) “Constructing the hypothalamus, from form to function”, Rockefeller Neuroscience Research

Institute, West Virginia University, Morgantown, WV.