

# Curriculum Vitae: Simon Kaja, PhD

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## Contact details:

Loyola University Chicago, Stritch School of Medicine, Department of Ophthalmology, 2160 S. First Ave, Maywood, IL 60153  
Phone: (708) 216-9223 | Phone: (708) 216-3557 | Email: [skaja@luc.edu](mailto:skaja@luc.edu)

## Personal Information:

Immigration status: US Permanent Resident (since Mar 2011)  
Citizenship: German

## Education:

- **2007:** Ph.D. (2002-2006) *in Neuroscience/Neurophysiology*  
*University of Leiden, Leiden, The Netherlands*  
*Date of award: Feb 6, 2007*  
*Dissertation: Synaptic effects of mutations in neuronal Cav2.1 calcium channels. (ISBN 9-78097819050-7)*  
*Mentors: M.D. Ferrari (M.D.) and R.R. Frants (Ph.D.)*
- **2002:** B.Sc. (1998-2002) First Class Honours *in Molecular Biology and Biochemistry with Industrial Placement*,  
*School of Biological and Biomedical Sciences, University of Durham, Durham, UK*  
*Thesis: Aberrant cerebellar GABA<sub>A</sub> receptor expression in the ataxic mouse mutant, Tottering.*  
*Mentor: C.L. Thompson (Ph.D.)*

## Professional Experience:

### Present positions:

- 07/2015 – present: Assistant Professor; Dr John P & Therese E Mulcahy Endowed Professor in Ophthalmology  
*Loyola University Chicago, Stritch School of Medicine, Department of Ophthalmology*
- 07/2015 – present: Research Health Scientist (WOC)  
*Edward Hines Jr. Veterans Administration Hospital*

### Previous Positions:

- 01/2009 – 07/2015: Research Assistant Professor  
*University of Missouri – Kansas City, Department of Ophthalmology, School of Medicine;*  
*Associate Director Preclinical Research; Vision Research Center;*  
*Adjunct Doctoral Faculty, University of Missouri – Kansas City, School of Graduate Studies.*
- 10/2008 – 12/2008: Research Scientist  
*Laboratory Professor Peter Koulen, University of North Texas Health Science Center at Fort Worth, Fort Worth, TX*  
*Department of Pharmacology and Neuroscience*
- 07/2008 - 10/2008: Research Scientist II, Neuroscience Consultant  
*Neurosearch A/S, Ballerup, Denmark; Department of Behavioral Pharmacology II*
- 2006-2008: Senior Research Associate  
*Laboratory Professor Terrance P. Snutch, Michael Smith Laboratories, The University of British Columbia,*  
*Vancouver, BC, Canada and Neuromed Pharmaceuticals, Vancouver, BC, Canada*
- 2000-2001: Research Assistant  
*NovoNordisk A/S, Søborg, Denmark; Department of Molecular Biology and Virology*

## Honors and Awards:

- Excellence in Mentoring Award 2013; UMKC School of Medicine (*this annual award recognizes one faculty member who has shown outstanding commitment to student education*);
- Michael Smith Foundation for Health Research postdoctoral trainee award (2006-2008);
- European Molecular Biology Organization postdoctoral fellowship (2006-2008);
- RUBICON grant (Netherlands Organisation for Scientific Research);
- Ph.D. scholar of the German National Merit Foundation (2003-2006);
- British Neuroscience Association Undergraduate Award 2002/2003 for outstanding achievement in Neuroscience;
- Neuroscience North East 2002, Sunderland, UK: Best oral presentation award
- Boulter Prize in Molecular Biology 2002, University of Durham; *recognizes the top-of-class graduate*
- Scholar of the e-fellows.net Foundation (2001 – 2006);
- Undergraduate scholar of the German National Merit Foundation (1999-2002).

## Teaching Experience:

- Neurochemistry 415
- Pharmacology 407 – Drug Discovery
- Pharmacology 408 – Receptor Pharmacology
- Pharmacology 409 – Advanced Pharmacology
- Human Structure Function – Cardiac Physiology
- Course director: UMKC, Medical School Elective #1895 - Research in Ophthalmology
- Course director: UMKC, Medical School Elective #2160 – Basic Research in Neuroscience

## Teaching Interests:

- Neurophysiology: synaptic transmission, central and peripheral synapses
- Cell Biology: synaptic biology of aging
- Research Methods, Ethics and Skills
- Methods in Neuroscience
- Pharmacology: calcium channels, GABAA receptors
- Neurobiology of disease: neurodegenerative, neurological, ocular disorders
- Neuroinflammation
- Other courses that fall into the general area of my expertise, i.e. neurophysiology, neuroscience, pharmacology, neuroanatomy, and molecular and cell biology.

## Research Support:

### Current Research Support

#### Pending Support

NIH 1R01EY026952-01  
Novel antioxidant therapy targeting lacrimal gland pathology in dry-eye disease  
Role: PI

NIH 1R03CA208571-01  
Targeting Kv11.1 channel for ovarian cancer therapeutic intervention.  
Role: Co-I

### Previous Research Support:

Kansas City Life Sciences Institute / Patton Trust Research Grant      Kaja (PI)      07/01/2011 – 06/30/2012  
A Novel Canine Model for Early-Onset Cerebellar Ataxia.  
The goal of this project was to characterize and identify the genetic locus of a novel canine model for rare childhood-onset cerebellar ataxia.  
Role: Co-PI

Fight for Sight / Grant-in-Aid      \$20,000      Kaja (PI)      08/01/2010 – 09/30/2011  
Lacrimal gland dysfunction: A first step towards novel pharmacotherapy for dry eye disease.  
The goal of this project was to show feasibility for novel cytoprotective therapy in dry eye disease, targeting intracellular calcium channels expressed in lacrimal acinar cells.

Role: PI

National Headache Foundation / Research Grant 2009 \$10,000 Kaja (PI) 04/01/2009 – 03/31/2010  
Novel mechanism underlying the visual impairments during migraine headaches.  
The goal of this project was to elucidate the mechanism of migraine-related altered intracellular calcium signaling in the retina and its effects on vision and to test the feasibility of pharmaceutical intervention to restore visual impairments during migraine.

Role: PI

MSFHR ST-PDF-140(05-1)BM \$5,000 Kaja (PI) 07/01/2006 – 06/30/2008  
Functional characterization of low-voltage activated T-type calcium channels in cerebellar slices of wild-type and P/Q-type calcium channel mutant mice.  
The goal of this project was to identify the mechanisms underlying cerebellar neurological deficits associated with calcium channelopathies in ataxic and non-ataxic calcium channel mutant mice.

Role: PI

## Professional Affiliations:

### Current:

- Society for Neuroscience
- Association for Research in Vision and Ophthalmology
- International Society for Eye Research
- Association for Ocular Pharmacology and Therapeutics

### Previous:

- Biophysical Society (full member)
- The Institute of Biology London (MBiol)
- British Neuroscience Association (student member; member in training)
- Dutch Neurofederation (student member)
- Federation of European Neuroscience Societies (student member)
- International Brain Research Organization (student member)

## Service:

### Editorial Activities

- Editor in Chief: Journal of Biology and Medicine (2013 – present)
- Editorial Board: Asian Journal of Neuroscience (2012 – present)
- Editorial Board: Webmed Central Plus (2012 – present)
- Topical Editor: Pharmacology, Journal of Life Medicine (2014 – present)
- Editorial Board: Austin Journal of Clinical Ophthalmology (2014 – present)

### Reviewer Activities

- Grant reviewer:
  - Alzheimer's Association,
  - Fight for Sight,
  - University of Missouri Research Board

### Journal reviewer:

- Neurobiology of Aging,
- Clinical Therapeutics,
- PLoS One
- Brain Research,
- Clinical Ophthalmology;
- Eye and Brain,
- Neuroscience Letters;
- International Journal of Developmental Neuroscience;
- Journal of Clinical Trials;
- Journal of Biology and Medicine;
- Ophthalmology Research;
- Austin Journal of Clinical Ophthalmology

### Institutional Service:

- Member: Seminar Series Committee, Loyola University Chicago, Dept. of Molecular Pharmacology and Therapeutics (2015 to present)

- Member: Research Committee, Loyola University Chicago, Department of Ophthalmology
- Member: Institutional Biosafety Committee, Edward Hines Jr. VA Hospital (2016 to present)
- Sarah Morrison Student Research Award, UMKC School of Medicine, Member of the Faculty Evaluation Committee (2010 – 2015)
- UMKC School of Medicine Student Research Day, Juror (2011-2014)

Professional service:

- Juror, Annual Meeting, Chicago Chapter Society for Neuroscience (2016)

## Publications:

Peer-reviewed articles:

1. Kaja S, Payne AJ, Nielsen EO, Thompson CL, Van den Maagdenberg AM, Koulen P, Snutch TP. Differential Cerebellar GABAA Receptor Expression in Mice with Mutations in CaV2.1 (P/Q-type) Calcium Channels. **Neuroscience**. 2015, 304: 198-208.
2. Kaja S, Payne AJ, Naumchuk Y, Levy D, Zaidi DH, Altman AM, Nawazish S, Ghuman JK, Gerdes BC, Moore MA, Koulen P. Plate reader-based cell viability assays for glioprotection using primary rat optic nerve head astrocytes. **Exp Eye Res**. 2015, 138:159-66.
3. Rao VR, Perez-Neut M, Kaja S, Gentile S. Voltage-gated ion channels in cancer proliferation. **Cancers (Basel)** 2015, 7:849-875.
4. Kaja S, Shah AA, Haji SA, Patel KB, Naumchuk Y, Zabaneh A, Gerdes BC, Kunjukunju N, Sabates NR, Cassell MA, Lord RK, Pikey KP, Poulouse A, Koulen P. Namp1/PBEF/visfatin serum levels – a new biomarker for retinal blood vessel occlusions. **Clin Ophthalmol** 2015, 9:611-618.
5. Kaja S, Payne AJ, Singh T, Ghuman JK, Sieck EG, Koulen P. An optimized lactate dehydrogenase release assay for screening of drug candidates in neuroscience. **J Pharmacol Toxicol Methods** 2015, 73: 1-6.
6. Kaja S, Payne AJ, Patel KR, Naumchuk N, Koulen P. Differential subcellular Ca<sup>2+</sup> signaling in a highly specialized subpopulation of astrocytes. **Experimental Neurology** 2015, 265: 59-68
7. Kaja S, Sumien N, Shah VV, Puthawala I, Maynard AN, Khullar N, Payne AJ, Forster MJ, Koulen P. Loss of Spatial Memory, Learning, and Motor Function During Normal Aging Is Accompanied by Changes in Brain Presenilin 1 and 2 Expression Levels. **Molecular Neurobiology** 2014, [Epub ahead of print] PMID: 25204494.
8. Payne AJ, Kaja S, Koulen. Regulation of ryanodine receptor-mediated calcium signaling by presenilins. **Receptors and Clinical Investigation** 2015, 2:e449.
9. Nielsen EØ, Kaja S.  $\uparrow$  GABA<sub>A</sub> Receptor Expression in the Forebrain of Ataxic Rolling Nagoya Mice. **Journal of Biology and Medicine** 2014, 6:1.
10. McCalley AE, Kaja S, Payne AJ, Koulen P. Resveratrol and calcium signaling: molecular mechanisms and clinical relevance. **Molecules** 2014, 19:7327–40.
11. Payne AJ, Kaja S, Naumchuk Y, Kunjukunju N, Koulen P. Antioxidant drug therapy approaches for neuroprotection in chronic diseases of the retina. **International Journal of Molecular Sciences** 2014, 15:1865-86.
12. Kaja S,\* $\uparrow$  Naumchuk Y,\* Grillo SL, Borden PK, Koulen P. Differential up-regulation of Ves1-1/Homer 1 protein isoforms associated with decline in visual performance in a preclinical glaucoma model. **Vision Research** 2014, 94C; 16-23.
13. Payne AJ, Gerdes BC, Kaja S, Koulen P. Bicistronic mammalian expression vectors containing optogenetic markers: Effect of insert sequence length on transfection efficiency and differential effects on gene expression levels. **International Journal of Molecular and Cellular Biology** 2013; 4:201-208.
14. Payne AJ, Gerdes BC, Naumchuk Y, McCalley AE, Kaja S, Koulen P. Presenilins regulate the cellular activity of ryanodine receptors differentially through isotype-specific N-terminal cysteines. **Experimental Neurology** 2013; 250:143-150.
15. Payne AJ, Kaja S, Sabates NR, Koulen P. Neuroprotection in Eye Disease: Developments in Translational Research. **Missouri Medicine** 2013, 110:429-436.
16. Kaja S, Sumien N, Borden PK, Khullar N, Iqbal M, Collins JL, Forster MJ, Koulen P. Homer-1a immediate early gene expression correlates with better cognitive performance in aging. **Age** 2013, 35:1799-1808.
17. Wachter A, Kaja S  $\uparrow$ . Aggregation of microglia in 2D with String Gradient Weighted Moving Finite Elements. **Mathematical Methods in The Applied Sciences** 2013, 36:1649-1663

18. Romero-Suarez S, Mo C, Touchberry C, Lara N, Baker K, Craig R, Brotto L, Andresen J, Wacker M, Kaja S, Abreu E, Dillmann W, Mestri R, Brotto M, Nosek T. Hyperthermia: From Diagnostic and Treatments to New Discoveries. **Recent Patents on Biotechnology** 2012, 6:172-183.
19. Kaja S, Hilgenberg JD, Clark JL, Shah AA, Wawwro D, Zimmermann S, Magnusson R, Koulen P. Detection of novel biomarkers for ovarian cancer with an optical nanotechnology detection system enabling label-free diagnostics. **Journal of Biomedical Optics** 2012, 17: 81412-21.
20. Kaja S, Goad DL, Ali F, Abraham A, Rebenitsch RL, Teymoorian S, Krishna R, Koulen P. Evaluation of tensile strength of tissue adhesives and sutures for clear corneal incisions using porcine and bovine eyes, with a novel standardized testing platform. **Clinical Ophthalmology** 2012, 6:305-9.
21. Chhablani J, Kaja S, Shah VA. Smartphones in ophthalmology. **Indian Journal of Ophthalmology** 2012, 60:127-31.
22. Kaja S, Mafe OA, Parikh RA, Kandula P, Reddy CA, Gregg EV, Xin H, Mitchell P, Grillo MA, Koulen P. Distribution and function of polycystin-2 in mouse retinal ganglion cells. **Neuroscience** 2012, 202:99-107.
23. Burroughs SL, Duncan RS, Rayudu P, Kandula P, Payne AJ, Clark JL, Koulen P, Kaja S. Plate reader-based assays for measuring cell viability, neuroprotection and calcium in primary neuronal cultures. **Journal of Neuroscience Methods** 2012, 203:141-52011.
24. Kaja S, Hilgenberg JD, Everett E, Olitsky SE, Gossage J, Koulen P. Effects of dilution and prolonged storage with preservative in a polyethylene container on Bevacizumab (Avastin™) for topical delivery as a nasal spray in anti-hereditary hemorrhagic telangiectasia and related therapies. **Human Antibodies**. 2011;20(3):95-101.
25. Kaja S, Hilgenberg JD, Rybalchenko V, Medina-Ortiz WE, Gregg EV, Koulen P. Polycystin-2 expression and function in adult mouse lacrimal acinar cells. **Invest Ophthalmol Vis Sci**. 2011;52(8):5605-11.
26. Burroughs SL, Kaja S, Koulen P. Quantification of deficits in spatial visual function of mouse models for glaucoma. **Invest Ophthalmol Vis Sci**. 2011;52(6):3654-9.
27. Garg P, Duncan RS, Kaja S, Zabaneh A, Chapman KD, Koulen P. Lauroylethanolamide and linoleylethanolamide improve functional outcome in a rodent model for stroke. **Neurosci Lett**. 2011;492(3):134-8.
28. Kaja S, Duncan RS, Longoria S, Hilgenberg JD, Payne AJ, Desai NM, Parikh RA, Burroughs SL, Gregg EV, Goad DL, Koulen P. Novel mechanism of increased Ca(2+) release following oxidative stress in neuronal cells involves type 2 inositol-1,4,5-trisphosphate receptors. **Neuroscience**. 2011;175:281-91.
29. Kaja S, Van de Ven RC, Broos LA, Frants RR, Ferrari MD, Van den Maagdenberg AM, Plomp JJ. Severe and progressive neurotransmitter release aberrations in familial hemiplegic migraine type 1 Cacna1a S218L knock-in mice. **J Neurophysiol**. 2010;104(3):1445-55.
30. Duncan RS, Goad DL, Grillo MA, Kaja S, Payne AJ, Koulen P. Control of intracellular calcium signaling as a neuroprotective strategy. **Molecules**. 2010;15(3):1168-95. PMID: 2847496.
31. van den Maagdenberg AM \*, Pizzorusso T \*, Kaja S \*, Terpolilli N \*, Shapovalova M, Hoebeek FE, Barrett CF, Gherardini L, van de Ven RC, Todorov B, Broos LA, Tottene A, Gao Z, Fodor M, De Zeeuw CI, Frants RR, Plesnila N, Plomp JJ, Pietrobon D, Ferrari MD. High cortical spreading depression susceptibility and migraine-associated symptoms in Ca(v)2.1 S218L mice. **Ann Neurol**. 2010;67(1):85-98.
32. Garg P, Duncan RS, Kaja S, Koulen P. Intracellular mechanisms of N-acylethanolamine-mediated neuroprotection in a rat model of stroke. **Neuroscience**. 2010;166(1):252-62. PMID: 2830814.
33. Plomp JJ, van den Maagdenberg AM, Kaja S. The ataxic Cacna1a-mutant mouse rolling nagoya: an overview of neuromorphological and electrophysiological findings. **Cerebellum**. 2009;8(3):222-30. PMID: 2734259.
34. Kaja S, Van De Ven RC, Frants RR, Ferrari MD, Van Den Maagdenberg AM, Plomp JJ. Reduced ACh release at neuromuscular synapses of heterozygous leaner Ca(v)2.1-mutant mice. **Synapse**. 2008;62(5):337-44.
35. Kaja S, Hann V, Payne HL, Thompson CL. Aberrant cerebellar granule cell-specific GABAA receptor expression in the epileptic and ataxic mouse mutant, Tottering. **Neuroscience**. 2007;148(1):115-25.
36. van de Ven RC, Kaja S, Plomp JJ, Frants RR, van den Maagdenberg AM, Ferrari MD. Genetic models of migraine. **Arch Neurol**. 2007;64(5):643-6.
37. Kaja S, van de Ven RC, van Dijk JG, Verschuuren JJ, Arahata K, Frants RR, Ferrari MD, van den Maagdenberg AM, Plomp JJ. Severely impaired neuromuscular synaptic transmission causes muscle weakness in the Cacna1a-mutant mouse rolling Nagoya. **Eur J Neurosci**. 2007;25(7):2009-20.
38. Kaja S, Todorov B, van de Ven RC, Ferrari MD, Frants RR, van den Maagdenberg AM, Plomp JJ. Redundancy of Cav2.1 channel accessory subunits in transmitter release at the mouse neuromuscular junction. **Brain Res**. 2007;1143:92-101.

39. Kaja S, van de Ven RC, Broos LA, Frants RR, Ferrari MD, van den Maagdenberg AM, Plomp JJ. Characterization of acetylcholine release and the compensatory contribution of non-Ca(v)2.1 channels at motor nerve terminals of leaner Ca(v)2.1-mutant mice. **Neuroscience**. 2007;144(4):1278-87.
40. Todorov B, van de Ven RC, Kaja S, Broos LA, Verbeek SJ, Plomp JJ, Ferrari MD, Frants RR, van den Maagdenberg AM. Conditional inactivation of the Cacna1a gene in transgenic mice. **Genesis**. 2006;44(12):589-94.
41. Kaja S, Van de Ven RC, Ferrari MD, Frants RR, Van den Maagdenberg AM, Plomp JJ. Compensatory contribution of Cav2.3 channels to acetylcholine release at the neuromuscular junction of tottering mice. **J Neurophysiol**. 2006;95(4):2698-704.
42. Kaja S, van de Ven RC, Broos LA, Veldman H, van Dijk JG, Verschuuren JJ, Frants RR, Ferrari MD, van den Maagdenberg AM, Plomp JJ. Gene dosage-dependent transmitter release changes at neuromuscular synapses of CACNA1A R192Q knockin mice are non-progressive and do not lead to morphological changes or muscle weakness. **Neuroscience**. 2005;135(1):81-95.
43. van den Maagdenberg AM, Pietrobon D, Pizzorusso T, Kaja S, Broos LA, Cesetti T, van de Ven RC, Tottene A, van der Kaa J, Plomp JJ, Frants RR, Ferrari MD. A Cacna1a knockin migraine mouse model with increased susceptibility to cortical spreading depression. **Neuron**. 2004;41(5):701-10.
44. Kaja S, Yang SH, Wei J, Fujitani K, Liu R, Brun-Zinkernagel AM, Simpkins JW, Inokuchi K, Koulen P. Estrogen protects the inner retina from apoptosis and ischemia-induced loss of Ves1-1L/Homer 1c immunoreactive synaptic connections. **Invest Ophthalmol Vis Sci**. 2003;44(7):3155-62.

#### Books and book chapters:

- Naumchuk Y, Shah V, **Kaja S**. Mobile Technology in Tele-education. In: Teleophthalmology in Preventive Medicine, Springer, Berlin Heidelberg, Georg Michelson (Ed.) 2015, pp 105-113. ISBN 978-3-662-44974-5
- **Kaja S**, A.J. Payne, S.L. Burroughs, P. Koulen. Homer. Encyclopedia of Signaling Molecules, Choi, Sangdun (Ed.), 1st Edition, 2013. ISBN 978-1-4419-0460-7.
- Naumchuk Y, Shah V, **Kaja S**. Mobile Technology in Tele-Education. In Tele-Ophthalmology in Preventive Medicine. Springer, Sven Klemp, Senior (Ed.). 2014
- **Kaja S**. Synaptic effects of mutations in neuronal Cav2.1 calcium channels. 2007 Doctoral thesis; ISBN 9-78097819050-7.

#### Editorials:

1. Kalesnykas G, Rawal AS and Kaja S. The need for relevant functional endpoints in ophthalmic drug discovery. **Austin Journal of Clinical Ophthalmology** 2014, 1:2.
2. Kaja S and Payne AJ. Novel Treatment Strategies for Neurological and Neurodegenerative Diseases. **Journal of Biology and Medicine** 2014, 1:S1.

### **Abstracts and conference contributions:**

#### All contributions of the previous five years

1. Kaja S, Payne AJ, Naumchuk Y, Sieck EG, Voelker DH, Zaidi DH, Koulen P. Glioprotection of adult optic nerve head astrocytes. Society for Neuroscience Annual Meeting 2015, Program #384.02, Oct 19, 2015. Chicago, IL.
2. Kaja S. Modulation of ryanodine receptors by presenilins. 4<sup>th</sup> International Conference on Neurology and Therapeutics, July 27-29, Rome, Italy.
3. Kaja S, Payne AJ, Naumchuk Y, Zaidi DH, Nawazish S, Levy D, Gerdes BC, Koulen P. Novel plate reader-based assay measuring glioprotection in primary adult optic nerve head astrocytes. ARVO Meeting 2015, Denver CO, May 2-7, 2015.
4. Naumchuk Y, Payne AJ, Patel KR, Kaja S, Koulen P. Differential control of intracellular calcium signaling in primary adult rat optic nerve head astrocytes. Association for Ocular Pharmacology and Therapeutics Annual Meeting 2015, Charleston, SC, Feb 26-29, 2015.
5. Kaja S, Payne AJ, Naumchuk Y, Zaidi DH, Nawazish S, Levy D, Ghuman JK, Gerdes BC, Koulen P. Novel plate reader-based assay measuring glioprotection in primary optic nerve head astrocytes. Association for Ocular Pharmacology and Therapeutics Annual Meeting 2015, Charleston, SC, Feb 26-29, 2015.

6. Kaja S, Payne AJ, Naumchuk Y, Levy DL, Altman AM, Gerdes BC, Koulen P. Primary rat optic nerve head astrocyte culture for glioprotection studies in glaucoma. 7<sup>th</sup> Ocular Diseases Drug Discovery Conference, Mar 19-20, San Diego CA
7. Kaja S. The eye: an accessible gateway to altering brain function. 12th Annual Meeting of the Society for Brain Mapping & Therapeutics, Mar 6-8, Los Angeles, CA
8. Kaja S, Sumien N, Shah VV, Puthawala I, Maynard AN, Khullar N, Payne AJ, Forster MJ, Koulen P. Loss of Spatial Memory, Learning, and Motor Function During Normal Aging Is Accompanied by Changes in CNS Presenilin 1 and 2 Expression Levels. Society for Neuroscience Annual Meeting 2014, Program #384.05, Nov 17, 2014. Washington, DC. [*Minisymposium*]
9. Kaja S. Calcium signaling in adult rat optic nerve head astrocytes. EMBO US Fellows Meeting, San Diego CA, Nov 7-10, 2014.
10. Hahl P, Davis T, Rogers JT, Kaja S, Smith A. Using the cytoprotective hemopexin system to explain a mechanism for heme toxicity: or why heme oxygenases need help. 8<sup>th</sup> International Conference on Heme Oxygenases, Biolron & Oxidative Stress, Sydney, Australia, Oct. 8-11, 2014.
11. Kaja S, Shah AA, Haji SA, Patel KB, Naumchuk Y, Zabaneh A, Gerdes BC, Kunjukunju N, Sabates NR, Cassell MA, Lord RK, Pikey KP, Poulouse A, Koulen P. Serum Namp1/PBEF/visfatin levels correlate with incidence of retinal vein occlusions. ARVO Meeting 2014, Orlando FL, May 3-8, 2014.
12. Koulen P, Payne AJ, Patel KR, Naumchuk Y, Kaja S. IP3 and ryanodine receptors control intracellular calcium signaling in adult rat optic nerve head astrocytes. ARVO Meeting 2014, Orlando FL, May 3-8, 2014.
13. Kaja S, Naumchuk Y, Sumien N, Khullar N, Moore MA, Forster MA, Koulen P. Age-related changes of cerebellar Ves1/Homer expression correlate with decline in motor coordination. Society for Neuroscience Annual Meeting 2013, Program #717.14, Nov 13, 2013. San Diego, CA.
14. Kaja, S. Drug discovery for cerebellar ataxias: novel strategies (Opening keynote lecture). 2<sup>nd</sup> Annual Conference on Neurology and Therapeutics, June 17-19, 2013, Chicago, IL.
15. Kaja, S, Naumchuk Y, Grillo SL, Borden PK, Koulen P. Differential overexpression of Homer 1 isoforms is associated with hallmarks of disease and decline in visual performance in a preclinical model of glaucoma. ARVO Meeting Abstracts June 16, 2013 54:6099.
16. Kaja, S. Smartphones in Vision Research (program #354; slide presentation), in: Smartphones in Ophthalmology (Organizers: Kaja S and Shah V). ARVO Meeting, May 5-9, 2013, Seattle, WA.
17. Kaja, S. Neuroprotection of the Retina by N-acylethanolamines (program # 266; slide presentation), in: Endocannabinoid Signaling in the Retina – From Biochemistry to Disease to Therapy (Organizers: Koulen P and Kaja S). ARVO Meeting, May 5-9, 2013, Seattle, WA.
18. Smith A, Hahl P, Davis T, Thakor P, Kaja S, Washburn C, Rogers JT. Modeling heme, iron and copper homeostasis in brain injury. Poster #202. International Biolron Society 2013 Annual Meeting. April 14 – 18, 2013. University College London, London, UK.
19. S. Kaja, S.L. Burroughs, P.K. Borden, Y. Naumchuk, P. Koulen. Homer-1 expression in the glaucomatous neural retina. Program No. 163.23. 2012 Neuroscience Meeting Planner. New Orleans, LA: Society for Neuroscience, 2012.
20. P. Koulen, S. Kaja, N. Sumien, P.K. Borden, N. Khullar, M.J. Forster. A decrease in Homer-1a immediate early gene expression predicts cognitive decline in aging. Program No. 835.09. 2012 Neuroscience Meeting Planner. New Orleans, LA: Society for Neuroscience, 2012.
21. S. Kaja, P. Koulen. Antioxidants Restore Lacrimal Gland Function Through A Calcium-Mediated Mechanism In Experimental Models Of Dry-eye Disease. ARVO Meeting Abstracts March 26, 2012 53:2346.
22. P. Koulen, K.D. Chapman, S. Kaja, S.L. Burroughs. Structural and Functional Protection of the Retina by N-Acylethanolamines in Glaucoma. ARVO Meeting Abstracts March 26, 2012 53:1135.
23. S. Kaja. Smartphone-Applications May Improve Workflow in Ophthalmology. World Ophthalmology Congress, Abu Dhabi, UAE, Feb 16-20, 2012. Slide presentation, *invited symposium speaker*.
24. P. Koulen, R.S. Duncan, S. Kaja. Functional and structural protection of retinal ganglion cells by N-acylethanolamines in diabetic retinopathy. Program No. 366.13. 2011 Neuroscience Meeting Planner, Washington, DC: Society for Neuroscience, 2011.
25. S. Kaja, P. Garg, P. Koulen. Novel mouse model for sporadic Alzheimer's Disease. Program No. 352.22. 2011 Neuroscience Meeting Planner, Washington, DC: Society for Neuroscience, 2011.
26. S. Kaja, J.D. Hilgenberg, P. Koulen. Polycystin-2 In Mouse Lacrimal Gland Acinar Cells. ARVO Meeting Abstracts April 22, 2011 52:3716.
27. P. Koulen, O.A. Mafe, R.S.Duncan, S. Kaja. Functional and Structural Protection by N-Acylethanolamines in Diabetic Retinopathy. ARVO Meeting Abstracts April 22, 2011 52:3937
28. S. Kaja, R.S. Duncan, P. Garg, S.L. Burroughs, P. Koulen. Neuroprotection by N-linoleoylethanolamine in vitro and in vivo. Society for Neuroscience Annual Meeting 2010, San Diego, CA, Nov 16-21, 2010. Poster presentation.

29. Payne, S. Kaja, S.-Y. Hwang, P. Koulen. Presenilin potentiates ryanodine receptor-mediated calcium release from intracellular stores. Society for Neuroscience Annual Meeting 2010, San Diego, CA, Nov 16-21, 2010. Slide presentation.
30. R.S. Duncan, S. Kaja, J.D. Hilgenberg, J. Clark, P. Koulen. N-acylethanolamines activate transcription factors involved in neuroprotective signaling. Society for Neuroscience Annual Meeting 2010, San Diego, CA, Nov 16-21, 2010. Poster presentation.
31. A.J. Payne, S. Kaja, and P. Koulen. Control of Ryanodine Receptor Mediated Calcium Signaling by Presenilins in Mouse Retinal Ganglion Cells. ARVO Meeting Abstracts April 11, 2010 51:1876. Poster presentation.
32. S. Kaja, D. L. Goad, E. V. Gregg, M. D. Ferrari, A. M. J. M. Van den Maagdenberg, T. P. Snutch, and P. Koulen. Reduced Presynaptic Signaling in Retinal Neurons of a Transgenic Mouse Model for Familial Hemiplegic Migraine. ARVO Meeting Abstracts April 11, 2010 51:5796. Slide presentation.
33. S. Kaja, R.S. Duncan, E.V. Gregg, D.L. Goad, P. Koulen. Type 2 inositol-1,4,5-trisphosphate (IP3) receptors mediate oxidative stress-induced increases of intracellular Ca<sup>2+</sup> release. Society for Neuroscience Annual Meeting 2009, Chicago, IL, Oct 16-21, 2009. Poster presentation.
34. P. Koulen, R.S. Duncan, S. Kaja, D.L. Goad. Potentiation of intracellular calcium release by gonadal steroid hormones in the central nervous system. Society for Neuroscience Annual Meeting 2009, Chicago, IL, Oct 16-21, 2009. Slide presentation.
35. S. Kaja, D.L. Goad, E.S. Nixon, P. Koulen. Estrogen controls intracellular calcium signaling in the retina. Society for Neuroscience Annual Meeting 2009, Chicago, IL, Oct 16-21, 2009. Slide presentation.
36. S. Kaja, E. Nixon, P. Koulen. Estrogen signaling in retinal neurons. Annual Meeting of the Association for Research in Vision and Ophthalmology 2009, Fort Lauderdale, FL, May 3-7, 2009. Poster presentation.

Selected contributions prior to 2009:

1. S. Kaja, J. Mezeyova, L. Qiu, R.S. Gopaul, A.M. Van den Maagdenberg, D. Parker, T.P. Snutch. Reduced expression of low-voltage activated calcium channels and GABA type A receptors in the cerebellum of familial hemiplegic migraine type 1 S218L knock-in mice. Society for Neuroscience Annual Meeting 2008, Washington, D.C., Nov 14-19, 2008. Poster presentation.
2. S. Kaja, M. Shapovalova, A. Tottene, J. Mezeyova, D. Parker, M.D. Ferrari, A.M. van den Maagdenberg, D. Pietrobon, T.P. Snutch. Absence of Functional Compensation in Cerebellar Neurons of Knock-in Mice with the Familial Hemiplegic Migraine Type 1 S218L Mutation. Society for Neuroscience Annual Meeting San Diego, CA 2007. Slide presentation
3. S.Kaja, R.C.G. Van de Ven, M.D. Ferrari, R.R. Frants, A.M.J. Van den Maagdenberg, J.J. Plomp. Differential non-Cav2.1 compensation profiles at motor nerve terminals of Leaner and Null Cav2.1-mutant mice. Society for Neuroscience Annual Meeting Atlanta, GA 2006. Slide presentation

**Invited Lectures:**

<b>Date</b>	<b>Title of presentation</b>	<b>Location</b>	<b>Host</b>
10/8/2014	Novel Avenues for Neuroprotection: Targeting Ca <sup>2+</sup> Signaling Pathways in Aging and Disease.	Departmental Seminar, Dept. of Molecular Pharmacology and Therapeutics, Loyola University, Maywood, IL	Dr. W. Keith Jones
7/23/2014	Novel targets for neuroprotection in glaucoma.	Ophthalmology Grand Rounds Seminar, Department of Ophthalmology, Loyola University, Maywood, IL	Dr. Charles Bouchard
6/16/2014	Novel targets for neuroprotection in glaucoma.	Departmental Seminar, Dept. of Ophthalmology, University of Tampere, Tampere, Finland	Dr. Hannu Uusitalo
6/13/2014	Novel Avenues for Neuroprotection: Targeting Calcium Signaling Pathways in Aging and Disease.	Departmental Seminar, Dept. of Neurobiology, University of Eastern Finland, Kuopio, Finland	Dr. Giedrius Kalesnykas
6/12/2014	The need for functional endpoints in drug discovery for ocular diseases.	Seminar, Experimentica Ltd., Kuopio, Finland	Dr. Giedrius Kalesnykas
1/16/2014	Calcium signaling in neurodegenerative and neurological disease	Departmental Seminar, Dept. of Cell Biology and Anatomy, Rosalind Franklin University of Medicine and Science, The Chicago Medical School, North Chicago, IL	Dr. William Frost



<b>Date</b>	<b>Title of presentation</b>	<b>Location</b>	<b>Host</b>
9/10/2013	Novel Neuroprotective Strategies for Neurodegenerative Diseases: Targeting Calcium Signaling Pathways	Departmental Seminar, Neuroscience Institute, Loyola University, Maywood, IL	Dr. Evan Stubbs
6/18/2013	Calcium signaling in preclinical disease models for migraine and glaucoma	Special Seminar, Department of Ophthalmology, Loyola University, Maywood, IL	Dr. Shuchi Patel
6/17/2013	Drug discovery for cerebellar ataxias: novel strategies	"Neurology and Therapeutics 2013" conference, Northbrook, IL	Organization Committee
6/13/2013	Functional imaging of calcium signaling pathways in neurodegenerative disease	Special Seminar, Creighton University, Omaha, NE	Dr. Richard Hallworth
2/13/2012	Neuroprotective strategies targeting calcium signaling: new hope for neurodegenerative diseases	Seminar Series, Ruhr University Bochum, Bochum, Germany	Dr. S. Herlitz
7/21/2011	qPCR: a user's perspective	Seminar Series, Shock/Trauma Research Center, University of Missouri- Kansas City, School of Medicine, Kansas City, MO	Dr. Charles Van Way III
12/09/2010	Novel neuroprotective strategies for neurodegenerative disease: targeting intracellular calcium signaling	Departmental Seminar, Institute of Physiology, University of Bern, Switzerland	Dr. Nina Ullrich
2/6/2010	Novel neuroprotective strategies for neurodegenerative disease: using high-resolution and high-throughput imaging for targeting intracellular calcium signaling	Invited Lecture, Perkin Elmer Germany and Hamburg Screening Port, Hamburg, German	Dr. Martin Daffertshofer
11/6/2010	Neuroprotection in Alzheimer's disease	Opening lecture, European Molecular Biology Organization US Fellows Meeting 2010, San Diego, CA	Organization Committee
8/26/2010	Calcium signaling in neurological and neurodegenerative disease: novel avenues for neuroprotection	Departmental Seminar, School of Biological Sciences, University of Missouri Kansas City, Kansas City, MO	Dr. Lawrence Dreyfus
2/12/2010	Ca <sup>2+</sup> signaling in neurodegenerative disease: novel avenues for neuroprotection	Departmental Seminar, School of Biological and Biomedical Sciences, University of Durham, UK	Dr. Paul Chazot
5/8/2009	Migraine, epilepsy, cerebellar ataxia and trauma: one pathophysiological mechanism?	Seminar Series, McKnight Brain Institute, University of Florida, Gainesville, FL	Dr. D. Steindler
3/11/2009	Novel Insights into Familial Hemiplegic Migraine: Involvement of the Visual System	Vision Research Seminar, Eye Foundation of Kansas City, UMKC School of Medicine, Department of Ophthalmology, Kansas City, MO	Dr. N. Sabates
10/7/2008	Novel therapeutic approaches for cerebellar ataxias	Scientific Seminar, Memory Disorders Research Unit, Copenhagen University Hospital, Copenhagen, Denmark	Dr. Joergen E. Nielsen
10/3/2008	Migraine: Insights from transgenic mouse models.	Scientific Seminar, Glostrup Research Institute, Glostrup Hospital, Glostrup, Denmark	Dr. Inger Jansen Olesen
6/22/2008	The role of Cav3.1 and GABA-A receptors in cerebellar ataxia.	Expert Seminar, Neuromed Pharmaceuticals Ltd., Vancouver, B.C., Canada	Dr. Terrance P. Snutch
4/8/2008	Migraine: Insights from two novel transgenic mouse models.	The Chris Thompson Memorial Symposium and Neuroscience North East, School of Biological and Biomedical Sciences, University of Durham, Durham, UK	Dr. Paul Chazot
1/22/2008	Migraine: Insights from a novel transgenic mouse model.	Departmental Seminar, Department of Pharmacology and Neuroscience, University of North Texas Health Science Center, Fort Worth, TX	Dr. M. Singh

<b>Date</b>	<b>Title of presentation</b>	<b>Location</b>	<b>Host</b>
11/23/2007	Migraine: Insights from two novel transgenic mouse models.	Departmental Seminar, School of Biological Sciences, University of Liverpool, Liverpool, UK	Dr. Steve Edwards
5/11/2007	Calcium Channel Dysfunction in Mouse Models for Epilepsy and Migraine.	Departmental Seminar, Department of Pharmacology, University of Innsbruck, Innsbruck, Austria	Dr. J. Striessnig
5/9/2007	<i>Cacna1a</i> S218L Knock-In Mice: A Model for Migraine, Trauma and Ataxia.	Departmental Seminar, Institute for Surgical Research, Ludwig-Maximilians-University Munich, Munich, Germany	Dr. N. Plesnila
5/7/2007	The Role of Calcium Channel Dysfunction in Migraine.	Departmental Seminar, Institute for Physiology II/Neurophysiology, University of Jena, Jena, Germany	Dr. F. Richter
5/4/2007	Migraine: Insights from a novel mouse model with the S218L mutation in the P/Q-type Ca <sup>2+</sup> channel.	Expert Seminar, Neuromed Pharmaceuticals Ltd., Vancouver, B.C., Canada	Dr. Terrance P. Snutch
10/10/2006	Muscle Weakness Contributes to the Phenotype of Rolling Nagoya Mutant Mice.	Colloquium, Michael Smith Laboratories, The University of British Columbia, Vancouver, BC, Canada	Dr. Terrance P. Snutch
10/3/2006	Synaptic effects of mutations in neuronal Cav2.1 calcium channels.	Departmental Seminar, Department of Pharmacology and Neuroscience, University of North Texas Health Science Center, Fort Worth, TX	Dr. Peter Koulen
3/22/2006	Synaptic effects of neurological disease-associated mutations in Cav2.1 calcium channels.	Departmental Seminar, Department of Neuropathology, Friedrich Alexander University Erlangen-Nuremberg, Erlangen, Germany	Dr. Ingmar Blümcke
10/11/2005	Characterization of neuromuscular synaptic transmission in the novel <i>Cacna1a</i> knock-in mouse model for familial hemiplegic migraine.	Departmental Seminar, Center for Molecular Neurobiology, University of Hamburg, Hamburg, Germany	Dr. T. Jentsch
5/16/2005	Recent advances in the study of Ca <sup>2+</sup> channel mutant mice.	Laboratory Seminar, Michael Smith Laboratories, University of British Columbia, Vancouver, Canada	Dr. Terrance P. Snutch
7/20/2004	P/Q-Type Calcium Channels in Health and Disease.	Departmental Seminar Molecular and Cell Biology Series, University of Durham, Durham, UK	Dr. Christopher Thompson

### **Trainees (current):**

- Zachary Green – M.S. - Committee member (current)
- Alexander Rockwell – M.S./M.B.A. – Lab rotation supervisor (current)
- Nikeyia Stiff – Volunteer, Proviso Academy of Mathematics and Science, Maywood, IL
- Elliot Savarese – Volunteer, DePaul University, Chicago, IL
- Vicki Husak – Research Health Scientist, Edward Hines Jr. VA Hospital

### **Trainees/Mentees (previous):**

#### Graduate students

- Bryan C. Gerdes – Ph.D. (commit) Biological Sciences, UMKC School of Medicine
- Michael A. Grillo – Ph.D. (2013) Biological Sciences, UMKC School of Medicine
- Andrew J. Payne – Ph.D. (2012) Pharmacology and Neuroscience, UNT Health Science Center

#### Ophthalmology residents

- Dr. Mouhammed AbuAttieh (2012-2013) – project: Biomarker discovery in Diabetic Retinopathy
- Dr. Hashim Haji (2012-2013) – project: Identification of SNPs in retinal vein occlusion
- Dr. Luke Rebenitsch (2011-2013) – project: Tissue adhesives in ophthalmology

#### Medical students

- Aarika Meenes (class of 2010; now resident, department of Ophthalmology, Mayo Clinic in Rochester, MN)

- Neeti Desai (class of 2011; now resident, department of Ophthalmology, Henry Ford Hospital, Detroit, MI) # \* \$
  - Ashley Abraham (class of 2012; now resident, department of Ophthalmology, UMKC, Kansas City, MO) # \$ --  
*Vice-Chancellor Honor's Medal Recipient for Leadership Spring 2012*
  - Parvathi Rayudu (class of 2012; now resident, department of Ophthalmology, UMSL, St. Louis, MO) \$
  - Fatima Ali (class of 2012; now resident, department of Ophthalmology, UMKC, Kansas City, MO) \* \$
  - Maaz Iqbal (class of 2012; now resident; department of Radiology, University of Kansas Wichita, Wichita, KS) #
  - Alexander Zabaneh (class of 2013; matched into residency; department of Ophthalmology, University of Chicago, Chicago, IL) # \$
  - David Camejo (class of 2013; matched into residency; department of Ophthalmology, Temple University, Philadelphia, PA)
  - ChanakyaRam Reddy (class of 2013; matched into residency; department of Internal Medicine, Washington University, St. Louis, MO) # \* \$
  - Sanjeev Keshary (class of 2013; matched into residency; department of Neurology, University of Kansas Medical Center, Kansas City, KS)
  - An D. Pham (class of 2013; matched into residency; department of Obstetrics & Gynecology, Loma Linda University, Loma Linda, CA) #
  - Ruby Parikh (class of 2014; matched into residency; department of Ophthalmology, Sinai Hospital, Baltimore, MD)
  - Anna Shah (class of 2014; matched into residency; department of Neurology, University of Michigan, Ann Arbor, MI) # \* \$ & % -- *Vice-Chancellor Honor's Medal Recipient for Leadership Spring 2014*
  - Seth Eisenberg (class of 2014) #
  - Prasanthi Kandula (class of 2014; matched into residency; department of Dermatology, Indiana University, Indianapolis, IN) # \* \$
  - Krishna Patel (class of 2014; matched into preliminary year, department of Surgery, Loyola University Chicago; residency: department of Ophthalmology, Cook County Hospital, Chicago IL) # \$
- 
- Trina Ghosh (class of 2015)
  - Aranyak Rawal (class of 2015) \$
  - Krupa Patel (class of 2015) &
  - Erin Sieck (class of 2015) \$ &
  - Imran Puthawala (class of 2015) #
  - Tulsi Singh (class of 2015)
  - Nitasha Khullar (class of 2016) & \$
  - Lorelei Robie (class of 2016)
  - Setu Patel (class of 2016) ¶
  - Vidhi Shah (class of 2016) # & \$
  - Lauren Thai (class of 2017)
  - Hasan Bader (class of 2016)
  - Harris Choudhry (class of 2016)
  - Saba Nawazish (class of 2016) &
  - Alexa Altman (class of 2016)
  - Deborah Levy (class of 2017) &
  - Reid Waldman (class of 2017)
  - Danish Zaidi (class of 2017)
  - Ankhith Mehta (class of 2017)
  - Jasleen Ghuman (class of 2017) &
  - Dayne Voelker (class of 2017)

#### Undergraduate students

- Grant M. Fischer (class of 2012 Rockhurst University; admitted to MD/PhD program at UT Houston, Houston, TX) – for credit Research Rotation in collaboration with Rockhurst University (3 credit hours, 4 semesters)
- Audrey McCalley (class of 2014 – graduated Dec 2013, UMKC School of Biological Sciences) ¶ & % \$ --  
*Vice-Chancellor Honor's Medal Recipient for Leadership Fall 2013*
- Christian Lamb (class of 2014 Rockhurst University)
- Alexandra N. Maynard (admitted to pre-Med program at Kansas State University, Manhattan, KS) & \$

#### Research staff

- Jill Hilgenberg (Research Assistant, 2009-2012)
- Julie Collins (Research Assistant, 2011-2013)
- Priscilla Borden (Research Assistant, 2012-2013)
- Bryan Gerdes (Research Assistant, 2012-2015)