PENG SHANG

Scientist, Doheny Eye Institute

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**EDUCATION/TRAINING**

University of Pittsburgh School of Medicine Pittsburgh, USA

**Postdoctoral associate** Oct 2017-Jun 2022

University of Pittsburgh Katz Graduate School of Business Pittsburgh, USA

**Micro-credential MBA courses, Leading People in Organization**  Sep 2021-Mar 2022

## Tongji University Shanghai, China

## ****Ph.D*.,***** Biomedical Engineering Sep 2012-Jun 2017

## Tongji University Shanghai, China

## Successive master-doctor program, Immunology Sep 2010-Aug 2012

## Hunan University of Science and Technology Hunan, China

## BEng, Biological Engineering Sep 2006-Jun 2010

**PROFESSIONAL EXPERIENCE**

1. **Visiting research student at The Wilmer Eye Institute, The Johns Hopkins University, School of Medicine, Baltimore, Maryland, USA. (2014-2017)**
2. **Scientist at Doheny Eye Institute, Pasadena, California, USA. (2022-present)**

**PROFESSIONAL MEMBERSHIP**

1. Member, Association for Research in Vision and Ophthalmology 2015-Present
2. Member, International Society for Eye Research 2018-2020

**HONORS**

1. National scholarship, Hunan University of Science and Technology, Hunan, China, 2008.
2. Outstanding student awards (for 4 consecutive years), Hunan University of Science and Technology, Hunan, China, 2006-2010.
3. A-grade academic scholarship, Tongji University, Shanghai, China, 2010-2015.
4. **Special acknowledgement award in** Wilmer Research Meeting, The Johns Hopkins University, School of Medicine, MD, USA, 2016.
5. Travel fellowship award from the International Society for Eye Research, Belfast, UK, 2018.
6. Junior Trainee award in the Biology and Chemistry of Vision Conference, Steamboat Springs, CO, USA, 2019.

**PATENT**

U.S. patent (Application No. 63/348,583) filed on “ANTI-LCN-2 ANTIBODIES AS A TREATMENT FOR EYE DISORDERS”, dated June 3, 2022. Inventors: Debasish Sinha, Jose Alain Sahel, Nadezda Anatolyena Stepicheva, **Peng Shang,** Sayan Ghosh, Stacey Hose, Urvi Gupta.

**PUBLICATIONS**

Gupta U, Ghosh S, Wallace CT, **Shang P**, Xin Y, Nair AP, Yazdankhah M, Strizhakova A, Ross MA, Liu H, Hose S, Stepicheva NA, Chowdhury O, Nemani M, Maddipatla V, Grebe R, Das M, Lathrop KL, Sahel JA, Zigler JS Jr, Qian J, Ghosh A, Sergeev Y, Handa JT, St Croix CM, Sinha D. Increased LCN2 (lipocalin 2) in the RPE decreases autophagy and activates inflammasome-ferroptosis processes in a mouse model of dry AMD. Autophagy. 2022 Apr 26;:1-20. doi: 10.1080/15548627.2022.2062887. [Epub ahead of print] PMID: 35473441.

**Shang P**, Stepicheva NA, Liu H, Chowdhury O, Franks J, Sun M, Hose S, Ghosh S, Yazdankhah M, Strizhakova A, Stolz DB, Zigler JS Jr, Sinha D. A Novel Method of Mouse RPE Explant Culture and Effective Introduction of Transgenes Using Adenoviral Transduction for In Vitro Studies in AMD. Int J Mol Sci. 2021 Nov 5;22(21). doi: 10.3390/ijms222111979. PMID: 34769409.

Yazdankhah M, Ghosh S, **Shang P**, Stepicheva N, Hose S, Liu H, Chamling X, Tian S, Sullivan MLG, Calderon MJ, Fitting CS, Weiss J, Jayagopal A, Handa JT, Sahel JA, Zigler JS Jr, Kinchington PR, Zack DJ, Sinha D. BNIP3L-mediated mitophagy is required for mitochondrial remodeling during the differentiation of optic nerve oligodendrocytes. Autophagy. 2021 Oct;17(10):3140-3159. doi: 10.1080/15548627.2020.1871204. Epub 2021 Jan 19. PMID: 33404293.

**Shang P**, Stepicheva N, Teel K, McCauley A, Fitting CS, Hose S, Grebe R, Yazdankhah M, Ghosh S, Liu H, Strizhakova A, Weiss J, Bhutto IA, Lutty GA, Jayagopal A, Qian J, Sahel JA, Samuel Zigler J Jr, Handa JT, Sergeev Y, Rajala RVS, Watkins S, Sinha D. βA3/A1-crystallin regulates apical polarity and EGFR endocytosis in retinal pigmented epithelial cells. Commun Biol. 2021 Jul 8;4(1):850. doi: 10.1038/s42003-021-02386-6. PMID: 34239035.

Yazdankhah M, **Shang P**, Ghosh S, Hose S, Liu H, Weiss J, Fitting CS, Bhutto IA, Zigler JS Jr, Qian J, Sahel JA, Sinha D, Stepicheva NA. Role of glia in optic nerve. Prog Retin Eye Res. 2021 Mar;81:100886. doi: 10.1016/j.preteyeres.2020.100886. Epub 2020 Aug 6. Review. PMID: 32771538.

Ghosh S, Liu H, Yazdankhah M, Stepicheva N, **Shang P**, Vaidya T, Hose S, Gupta U, Calderon MJ, Hu MW, Nair AP, Weiss J, Fitting CS, Bhutto IA, Gadde SGK, Naik NK, Jaydev C, Lutty GA, Handa JT, Jayagopal A, Qian J, Sahel JA, Rajasundaram D, Sergeev Y, Zigler JS Jr, Sethu S, Watkins S, Ghosh A, Sinha D. βA1-crystallin regulates glucose metabolism and mitochondrial function in mouse retinal astrocytes by modulating PTP1B activity. Commun Biol. 2021 Feb 24;4(1):248. doi: 10.1038/s42003-021-01763-5. PMID: 33627831.

Yazdankhah M, **Shang P**, Ghosh S, Bhutto IA, Stepicheva N, Grebe R, Hose S, Weiss J, Luo T, Mishra S, Riazuddin SA, Ghosh A, Handa JT, Lutty GA, Zigler JS Jr, Sinha D. Modulating EGFR-MTORC1-autophagy as a potential therapy for persistent fetal vasculature (PFV) disease. Autophagy. 2020 Jun;16(6):1130-1142. doi: 10.1080/15548627.2019.1660545. Epub 2019 Sep 1. PMID: 31462148.

Ghosh S, Stepicheva N, Yazdankhah M, **Shang P**, Watson AM, Hose S, Liu H, Weiss J, Zigler JS Jr, Valapala M, Watkins SC, Sinha D. The role of lipocalin-2 in age-related macular degeneration (AMD). Cell Mol Life Sci. 2020 Mar;77(5):835-851. doi: 10.1007/s00018-019-03423-8. Epub 2020 Jan 4. Review. PMID: 31901947.

Ghosh S, Padmanabhan A, Vaidya T, Watson AM, Bhutto IA, Hose S, **Shang P**, Stepicheva N, Yazdankhah M, Weiss J, Das M, Gopikrishna S, Aishwarya, Yadav N, Berger T, Mak TW, Xia S, Qian J, Lutty GA, Jayagopal A, Zigler JS Jr, Sethu S, Handa JT, Watkins SC, Ghosh A, Sinha D. Neutrophils homing into the retina trigger pathology in early age-related macular degeneration. Commun Biol. 2019;2:348. doi: 10.1038/s42003-019-0588-y. eCollection 2019. PMID: 31552301.

Stepicheva NA, Weiss J, **Shang P**, Yazdankhah M, Ghosh S, Bhutto IA, Hose S, Zigler JS Jr, Sinha D. Melatonin as the Possible Link Between Age-Related Retinal Regeneration and the Disrupted Circadian Rhythm in Elderly. Adv Exp Med Biol. 2019;1185:45-49. doi: 10.1007/978-3-030-27378-1\_8. PMID: 31884587.

Wang J, Zibetti C, **Shang P**, Sripathi SR, Zhang P, Cano M, Hoang T, Xia S, Ji H, Merbs SL, Zack DJ, Handa JT, Sinha D, Blackshaw S, Qian J. ATAC-Seq analysis reveals a widespread decrease of chromatin accessibility in age-related macular degeneration. Nat Commun. 2018 Apr 10;9(1):1364. doi: 10.1038/s41467-018-03856-y. PMID: 29636475.

Ghosh S, **Shang P**, Terasaki H, Stepicheva N, Hose S, Yazdankhah M, Weiss J, Sakamoto T, Bhutto IA, Xia S, Zigler JS Jr, Kannan R, Qian J, Handa JT, Sinha D. A Role for βA3/A1-Crystallin in Type 2 EMT of RPE Cells Occurring in Dry Age-Related Macular Degeneration. Invest Ophthalmol Vis Sci. 2018 Mar 20;59(4):AMD104-AMD113. doi: 10.1167/iovs.18-24132. PMID: 30098172.

**Shang P**, Stepicheva NA, Hose S, Zigler JS Jr, Sinha D. Primary Cell Cultures from the Mouse Retinal Pigment Epithelium. J Vis Exp. 2018 Mar 16;(133). doi: 10.3791/56997. PMID: 29608155.

Ghosh S, **Shang P**, Yazdankhah M, Bhutto I, Hose S, Montezuma SR, Luo T, Chattopadhyay S, Qian J, Lutty GA, Ferrington DA, Zigler JS Jr, Sinha D. Activating the AKT2-nuclear factor-κB-lipocalin-2 axis elicits an inflammatory response in age-related macular degeneration. J Pathol. 2017 Apr;241(5):583-588. doi: 10.1002/path.4870. Epub 2017 Feb 20. PMID: 28026019.

**Shang P**, Valapala M, Grebe R, Hose S, Ghosh S, Bhutto IA, Handa JT, Lutty GA, Lu L, Wan J, Qian J, Sergeev Y, Puertollano R, Zigler JS Jr, Xu GT, Sinha D. The amino acid transporter SLC36A4 regulates the amino acid pool in retinal pigmented epithelial cells and mediates the mechanistic target of rapamycin, complex 1 signaling. Aging Cell. 2017 Apr;16(2):349-359. doi: 10.1111/acel.12561. Epub 2017 Jan 13. PMID: 28083894.

Sinha D, Valapala M, **Shang P**, Hose S, Grebe R, Lutty GA, Zigler JS Jr, Kaarniranta K, Handa JT. Lysosomes: Regulators of autophagy in the retinal pigmented epithelium. Exp Eye Res. 2016 Mar;144:46-53. doi: 10.1016/j.exer.2015.08.018. Epub 2015 Aug 28. Review. PMID: 26321509.

Zigler JS Jr, Valapala M, **Shang P**, Hose S, Goldberg MF, Sinha D. βA3/A1-crystallin and persistent fetal vasculature (PFV) disease of the eye. Biochim Biophys Acta. 2016 Jan;1860(1 Pt B):287-98. doi: 10.1016/j.bbagen.2015.05.017. Epub 2015 May 31. Review. PMID: 26022148.

Zhuge CC, Xu JY, Zhang J, Li W, Li P, Li Z, Chen L, Liu X, **Shang P**, Xu H, Lu Y, Wang F, Lu L, Xu GT. Fullerenol protects retinal pigment epithelial cells from oxidative stress-induced premature senescence via activating SIRT1. Invest Ophthalmol Vis Sci. 2014 May 20;55(7):4628-38. doi: 10.1167/iovs.13-13732. PMID: 24845634.

**ACADEMIC ACTIVITIES**

**Oral presentations:**

RPE Cell Biology and Metabolism Seminar Series, bA3/A1-crystallin regulates apical polarity and EGFR endocytosis in retinal pigmented epithelial cells, Online, December 2020.

XXIII Biennial Meeting of the International Society for Eye Research – ISER,bA3/A1-crystallin is a potential regulator of receptor tyrosine kinases (RTKs) endocytosis and maintain the polarity of RPE cells,Belfast, Ireland, September, 2018.

The Association for Research in Vision and Ophthalmology (ARVO) annual meeting, bA3/A1-crystallin/SLC36A4/V-ATPase complex in the RPE is a novel therapeutic target for AMD.Baltimore, MD, May 2017.

Wilmer Research Meeting, The Johns Hopkins University,bA3/A1-crystallin/SLC36A4/V-ATPase complex in the RPE is a novel therapeutic target for AMD*.*Baltimore, MD, April 2017.

**Poster presentations:**

The Association for Research in Vision and Ophthalmology (ARVO) annual meeting, HDAC11 is a crucial regulator for visual cycle genes and retinal function, Denver, CO, May 2022.

The Biology and Chemistry of Vision Conference, A possible role of bA3/A1-crystallin in clathrin-mediated endocytosis of RPE cells, Steamboat Springs, Colorado 2019.

The Association for Research in Vision and Ophthalmology (ARVO) annual meeting, bA3/A1-crystallin is necessary for intracellular protein trafficking in mature RPE cells, Honolulu, Hawaii, May 2018.

The Association for Research in Vision and Ophthalmology (ARVO) annual meeting, bA3/A1-crystallin is essential for autophagic lysosomal reformation (ALR) in the retinal pigmented epithelial (RPE) cells. Seattle, WA, May 2016.

Wilmer Research Meeting, The Johns Hopkins University,bA3/A1-crystallin is essential for autophagic lysosomal reformation (ALR) in the retinal pigmented epithelial (RPE), Baltimore, MD, April 2016.

International Conference on Lens Research,A causal association between smoking and cataract? – dissection of the molecular mechanism in DN mouse model. Kona, Hawaii, February 2012.

**MANUSCRIPT REVIEWING**

Aging cell; communications biology; ageing research review; Annals of Medicine; cellular signaling; Scientific reports; Experimental eye research; Journal of visualized experiments

**RESEARCH MENTORSHIP**

**Research Technician**

**Christopher Scott Fitting Sep 2019-Aug 2021**

**Rachel Daley Sep 2021-Jun 2022**

**Undergraduate research assistant**

**Emma Mahally Sep 2021-Jun 2022**