

# CURRICULUM VITAE

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## PRESENT APPOINTMENT

Reader in Biomedical Science/Vision Science  
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## PREVIOUS APPOINTMENT

August 2011-July 2013 Senior lecturer  
February 2010-July 2011 Lecturer, Glasgow Caledonian University  
July 2005-February 2010 Senior Investigator Scientist  
MRC Human Genetics Unit, Edinburgh  
July 2001-June 2005 Investigator Scientist  
MRC Human Genetics Unit, Edinburgh  
Nov. 1999-July 2001 Wellcome Trust Travelling Fellow  
University of Glasgow  
July 1997-Oct. 1999 Lecturer  
Hunan Agricultural University  
Jan. 1995-June 1996 Assistant lecturer  
Hunan Agricultural University

## EDUCATION

Fellow of the Higher Education Academy from 2011  
Feb 2010-July 2011 Postgraduate Certificate in Learning and Teaching in Higher Education, Glasgow Caledonian University  
Sep 1996-June 1999 PhD student, Pathobiology (Immunology), Hunan Medical University, China  
Sep 1992-Dec 1994 MSc student, Veterinary pathology, Hunan Agricultural University, China  
Sep 1988-July 1992 BSc student, Biological Sciences, Honours, 1st Class, Hunan Normal University, China

## RESEARCH GRANT

35. Investigate retinal cholesterol homeostasis in an Alzheimer's disease mouse model. £20,000 from December 2020-May 2022, funded by Tenovus Scotland. PI.
34. Transcriptomics and metabolomics analyses of TSPO deleted retinal pigment epithelial cells, implication for age-related macular degeneration. £10,000 from December 2019-November 2020, funded by Scottish Universities Life Sciences Alliance. PI.
33. Evaluation of the efficacy of aspalathin in treating diabetic retinopathy. £8600 from February-August 2020, funded by Scottish Funding Council Global Challenges Research Fund programme. PI.
32. Evaluation of therapeutic potential of TSPO ligands for age-related macular degeneration. £2000 from June to August 2019, funded by Medical Research Scotland. PI.
31. Promotion of RPE cholesterol removal: a new therapeutic strategy for age-related macular degeneration. £70,000 from 01/08/2018-31/01/2021, funded by National Eye Research Centre. PI.
30. Enhancing cholesterol removal from retinal pigment epithelium and choroid endothelium cells, a new therapeutic strategy for age related macular degeneration. £30,000 from 01/03/2018-28/02/2021, funded by the Rostrees Trust. PI.

29. Assessment of retinal toxicity caused by algae toxins, £70,000 (PhD studentship) from 01/02/2018-31/01/2021, funded by the Angola government. PI.
28. Cholesterol homeostasis in age-related macular degeneration, £70,000 (PhD studentship) from 01/10/2017-30/09/2020, funded by Kuwait government. PI.
27. Promotion of the removal of cholesterol from retinal epithelium cells, a potential therapy for treating age related macular degeneration, £2000, funded by Medical Research Scotland, 2016. PI.
26. Developing drugs for retinitis pigmentosa in a zebrafish model, £20,000 from 01/07/2015-30/06/2017, Funded by the Rosetrees Trust. PI
25. Developing potential drugs for the treatment of Leber's congenital amaurosis, £40,000 from 07/2015-06/2016, Funded by the Yorkhill Children's Charity. PI
24. Retinal Sleep Lamp for treatment/prevention of diabetic retinopathy, £5000 from 03-09/2015, Funded by the Scottish Funding Council. PI
23. Development of therapeutic strategies for retinal ciliopathy, £70,000 (PhD studentship) from 01/10/2014-30/09/2017, funded by Saudi Arabia government. PI.
22. Zebrafish as a model for myopia, £1500 from 06-08/2014, funded by the Visual Trust. PI
21. The function of STARD proteins in retinal degeneration, £70,000 (PhD studentship) from 01/05/2014-30/04/2017, funded by Kuwait government. PI.
20. Gene therapy for retinitis pigmentosa, £2000 from 08-11/2013, funded by the Carnegie Trust for the Universities of Scotland. PI
19. Creation of a mini RPGR promoter for retinitis pigmentosa gene therapy, £100,000 (three-year PhD studentship) from 01/10/2013-30/09/2016, funded by UK Fight for Sight. PI
18. Protection of Carnosic acid against acrylamide-induced retinal toxicity, £70,000 (PhD studentship) from 01/10/2013-30/09/2016, funded by Saudi Arabia government. PI.
17. Patient specific induced pluripotent stem cells for understanding the pathogenesis of retinitis pigmentosa, £15,000 from 01-12/2013, funded by UK Fight for Sight. PI
16. NoPILLS in water, £2.1 million from January 2013-December 2015, funded by European Union. £150,000 to Dr X Shu. CoI.
15. An exploration of the anti-atherogenic potential of compounds targeting mitochondrial cholesterol transporter protein (TSPO) and the cholesterol efflux pathway, £90,000 from 2012-2014, funded by the Heart Research UK. CoI
14. Understanding the pathogenesis and development of therapeutic strategies for retinitis pigmentosa caused by RPGR mutations, £15,000 from 12/2011-11/2014, funded by Rosetrees Trust. PI
13. Making transgenic zebrafish for characterization of retinitis pigmentosa-causing RPGR mutations, £1000 from 1/08/2011-30/10/2011, funded by the Carnegie Trust for the Universities of Scotland. PI
12. The role of vitamin D in diabetic retinopathy, £70,000 (PhD studentship) from 01/10/2011-30/09/2014, funded by Saudi Arabia government. PI.
11. Functional characterization of retinitis pigmentosa-causing RPGR mutants, £60,000 (three-year PhD studentship) from 10/2011 to 09/2014, funded by national Eye Research Center. PI.
10. Characterization of a zebrafish retinitis pigmentosa model, £60,000 (PhD studentship) from 10/2011 to 09/2014, funded by Glasgow Caledonian University.
9. Functional characterisation of retinitis pigmentosa-causing RPGR mutations, £1440 from 07-09/2011, funded by Nuffield Foundation. PI.
8. Genetic and phenotypic analyses of X-linked retinitis pigmentosa in the Western Scotland, £4800 from 04/2011-03/2012, funded by the WH Ross Foundation. PI.
7. Zebrafish as a model for understanding the pathogenesis of retinitis pigmentosa, £15,000 from 10/2010-09/2011, funded by the Royal Society, London. PI.

6. Functional characterization of RPGR mutants in HEK 293T cells, £1200 from 09/2010-08/2011, funded by Visual Research Trust. PI
5. Functional analysis of RPGR mutations which cause retinitis pigmentosa in humans, £4000 from August 2010-July 2011, funded by the Tenovus Scotland. PI.
4. The role of RPGR in retinal degeneration, £96,804 from 02/2008-01/2010, funded by the British Retinitis Pigmentosa Society. PI.
3. Cell adhesion and extracellular deposit formation in age-related macular degeneration, £60,100 from 2005-2008, funded by UK Fight for Sight. PI
2. Morphological changes in human fungal pathogen *Paracoccidioides brasiliensis*: the role of the cAMP signalling pathway (project grant, £82,471, 1999-2001), funded by Wellcome trust. CoI
1. Vaccine for *Aeromonas hydrophila* in aquatic animals (30,000 RMB, 1999), funded by the Educational Department of Hunan Province. PI.

## Publications

101. Aitchison RT, Kennedy GJ, Shu X, Mansfield DC, Shahani U. Sub-clinical thickening of the fovea in diabetes and its relationship to glycaemic control: a study using swept-source optical coherence tomography. *Graefes Arch Clin Exp Ophthalmol*, in press.
100. Tu J, Liu X, Jia H, Reilly J, Yu S, Cai C, Liu F, Lv Y, Huang Y, Lu Z, Han S, Jiang T, **Shu X**, Wu X, Tang Z, Lu Q, Liu M. The chromatin remodeler Brg1 is required for formation and maintenance of hematopoietic stem cells. *FASEB J*. 2020 Aug 1. doi: 10.1096/fj.201903168RR.
99. Aderemi OA, Hunter C, Pahl O, Roberts J, Shu X (2020). Developmental Anomalies and Oxidative Stress Responses in Zebrafish (*Danio Rerio*) Following Embryonic Exposure to Human Pharmaceuticals. *International Journal of Toxicology and Environmental Health*, 4(2): 109-125.
98. Ibrahim KS\*, Craft JA, Biswas L, Spencer J, **Shu X\***. Etifoxine reverses weight gain and alters the colonic bacterial community in a mouse model of obesity. *Biochem Pharmacol*. 2020, 180, 114151. \*Corresponding author.
97. Tohari AM, Almarhoun M, Alhasani RH, Biswas L, Reilly J, Zeng Z, **Shu X\***. Protection by vitamin D against high-glucose-induced damage in retinal pigment epithelial cells. *Exp Cell Res*. 2020;392(1):112023. \* Corresponding author.
96. Biswas L, Zeng Z, Graham A, **Shu X\***. Gypenosides mediate cholesterol efflux and suppress oxidized LDL induced inflammation in retinal pigment epithelium cells. *Exp Eye Res*, 2020;191:107931. \* Corresponding author.
95. Zhao Z, Li G, Xiao Q, Jiang H, Tchivelekete GM, Shu X, Liu H. 2020. Quantification of the influence of drugs on zebrafish larvae swimming kinematics and energetics. *PeerJ* 8:e8374
94. Lu Z, Hu X, Reilly J, Jia D, Liu F, Yu S, Liu X, Xie S, Qu Z, Qin Y, Huang Y, Lv Y, Li J, Gao P, Wong F, **Shu X**, Tang Z, Liu M. Reply to Corbeil et al.: Deletion of the transmembrane protein Prom1b in zebrafish disrupts outer-segment morphogenesis and causes photoreceptor degeneration. *J Biol Chem*. 2019 Nov 8;294(45):17167.
93. Tohari AM, Alhasani RH, Biswas L, Patnaik SR, Reilly J, Zeng Z, **Shu X\***. Vitamin D Attenuates Oxidative Damage and Inflammation in Retinal Pigment Epithelial Cells. *Antioxidants (Basel)*, 2019,8(9). pii: E341. \* Corresponding author.
92. Lu Z, Hu X, Reilly J, Jia D, Liu F, Yu S, Liu X, Xie S, Qu Z, Qin Y, Huang Y, Lv Y, Li J, Gao P, Wong F, **Shu X**, Tang Z, Liu M. Deletion of the transmembrane protein Prom1b in zebrafish disrupts outer-segment morphogenesis and causes photoreceptor degeneration. *J Biol Chem*. 2019, 294(38): 13953-13963.
91. Zhang X, Shahani U, Reilly J, **Shu X\***. Disease mechanisms and neuroprotection by tauroursodeoxycholic acid in Rpgk1 knockout mice. *J Cell Physiol*, 2019, 234(10): 18801-18812. \*Corresponding author.
90. Alamri A, Biswas L, Watson DG, **Shu X\***. Deletion of TSPO resulted in change of metabolomic profile in retinal pigment epithelial cells. *Int J Mol Sci* 2019, 20(6). pii: E1387. \* Corresponding author.
89. Xie S, Han S, Qu Z, Liu F, Li J, Yu S, Reilly J, Tu J, Liu X, Lu Z, Hu X, Yimer TA, Qin Y, Huang Y, Lv Y, Jiang T, **Shu X**, Tang Z, Jia H, Wong F, Liu M. Knockout of Nr2e3 prevents rod photoreceptor differentiation and leads to

selective L-/M-cone photoreceptor degeneration in zebrafish. *Biochim Biophys Acta Mol Basis Dis.* 2019, pii: S0925-4439(19)30022-5.

**88.** Biswas L, Farhan F, Reilly J, Bartholomew C, **Shu X\***. TSPO ligands promote cholesterol efflux and suppress oxidative stress and inflammation in choroidal endothelial cells. *Int J Mol Sci* 2018, 19(12), 3740. \* Corresponding author.

**87.** Hu X, Lu Z, Yu S, Reilly J, Liu F, Jia D, Qin Y, Han S, Liu X, Qu Z, Lv Y, Li J, Huang Y, Jiang T, Wang Q, Liu J, **Shu X**, Tang Z, Liu M. CERKL regulates autophagy via the NAD-dependent deacetylase SIRT1. *Autophagy*, 2018, 25:1-13.

**86.** Aitchison RT, Ward L, Kennedy GJ, **Shu X**, Mansfield DC, Shahani U. Measuring visual cortical oxygenation in diabetes using functional near-infrared spectroscopy. *Acta Diabetologica*, 2018, 55(11):1181-1189.

**85.** Albalawi A, Alhasani R, Biswas L, Reilly J, Akhtar S, **Shu X\***. Carnosic acid attenuates acrylamide-induced retinal toxicity in zebrafish embryos. *Exp Eye Res*, 2018, 175: 103-114. \* Corresponding author.

**84.** Patnaik SR, Zhang X, Biswas L, Akhtar S, Zhou X, Kusuluri DK, Reilly J, May-Simera H, Chalmers S, McCarron JG, **Shu X\***. RPGR protein complex regulates proteasome activity and mediates store-operated calcium entry. *Oncotarget*, 2018, 9(33): 23183-23197. \* Corresponding author.

**83.** Patibandla S, Jiang JQ, **Shu X**. Toxicity assessment of four pharmaceuticals in aquatic environment before and after ferrate(VI) treatment. *J Environ Chem Eng*, 2018, 6: 3787-3797.

**82.** Patibandla S, Zhang Y, Tohari AM, Gu P, Reilly J, Chen Y, **Shu X\***. Comparative analysis of the toxicity of gold nanoparticles in zebrafish. *J Appl Toxicol.* 2018,38(8): 1153-1161. \* Corresponding author.

**81.** Alhasani RH, Biswas L, Tohari AM, Zhou X, Reilly J, He JF, **Shu X\***. Gypenosides protect retinal pigment epithelium cells from oxidative stress. *Food Chem Toxicol.* 2018, 112:76-85. \* Corresponding author.

**80.** Zhang X, Biswas L, Tohari AM, Reilly J, Tiano L, **Shu X\***. Coenzyme Q10 as a therapeutic candidate for treating inherited photoreceptor degeneration. *Neural Regen Res.* 2017,12(12):1979-1981. \* Corresponding author.

**79.** Raghupathy RK, Zhang X, Liu L, Alhasani RH, Biswas L, Akhtar S, Pan L, Moens CB, Li W, Liu M, Kennedy BN, **Shu X\***. Rpgrip1 is required for rod outer segment development and ciliary protein trafficking in zebrafish. *Sci Rep* 2017, 7(1):16881. \* Corresponding author.

**78.** Biswas L, Zhou X, Dhillon B, Graham A, **Shu X\***. Retinal pigment epithelium cholesterol efflux mediated by the18kDa translocator protein, TSPO, a potential target for treating age-related macular degeneration. *Hum Mol Genet*, 2017, 26(22):4327-4339. \* Corresponding author.

**77.** Zhang X, Tohari AM, Marcheggiani F, Zhou X, Reilly J, Tiano L, **Shu X\***. Therapeutic potential of co-enzyme Q10 in retinal diseases. *Curr Med Chem.* 2017,24(39):4329-4339. \* Corresponding author.

**76.** Yu S, Li C, Biswas L, Hu X, Liu F, Reilly J, Liu X, Liu Y, Huang Y, Lu Z, Han S, Wang L, Liu JY, Jiang T, **Shu X**, Wong F, Tang Z, Liu M. CERKL gene knockout disturbs photoreceptor outer segment phagocytosis and causes rod-cone dystrophy in zebrafish. *Hum Mol Genet.* 2017, 26(12):2335-2345.

**75.** Albalawi A, Alhasani RH, Biswas L, Reilly J, **Shu X\***. Protective effect of carnosic acid against acrylamide-induced toxicity in RPE cells. *Food Chem Toxicol.* 2017, 108(Pt B):543-553. \* Corresponding author.

**74.** Jia L, Raghupathy RK, Albalawi A, Zhao Z, Reilly J, Xiao Q, **Shu X\***. A colour preference technique to evaluate acrylamide-induced toxicity in zebrafish. *Comp Biochem Physiol C Toxicol Pharmacol.* 2017, 199:11-19. \* Corresponding author.

**73.** Liu F, Qin Y, Yu S, Soares DC, Yang L, Weng J, Li C, Gao M, Lu Z, Hu X, Liu X, Jiang T, Liu JY, **Shu X**, Tang Z, Liu M. Pathogenic Mutations in *Retinitis Pigmentosa 2* Predominantly Result in Loss of RP2 Protein Stability in Human and Zebrafish. *J Biol Chem.* 2017, 292(15):6225-6239

**72.** Zhang X, Reilly J, **Shu X\***. Reflection on the Efficacy of Gene Therapy in the Treatment of Inherited Retinal Degeneration. *Clon Transgen*, 2016, 5:e122. \* Corresponding author.

**71.** Raghupathy RK, Zhang X, Alhasani RH, Zhou X, Mullin M, Reilly J, Li W, Liu M, **Shu X\***. Abnormal photoreceptor outer segment development and early retinal

- degeneration in *kif3a* mutant zebrafish. *Cell Biochem Funct.* 2016, 34(6):429-40.  
\* Corresponding author.
70. Tohari A, Zhou X, **Shu X\***. Protection against oxidative stress by vitamin D in cone cells. *Cell Biochem Funct* 2016; 34(2): 82-94. \* Corresponding author.
69. Pawlyk BS, Bulgakov OV, Sun X, Adamian M, **Shu X**, Smith AJ, Berson EL, Ali RR, Khani S, Wright AF, Sandberg MA, Li T. Photoreceptor rescue by an abbreviated human RPGR gene in a murine model of X-linked retinitis pigmentosa. *Gene Ther.* 2016; 23(2):196-204.
68. Raghupathy RK, Gautier P, Soares DC, Wright AF, **Shu X\***. Evolutionary Characterization of the Retinitis Pigmentosa GTPase Regulator Gene. *Invest Ophthalmol Vis Sci.* 2015, 56(11):6255-64. \* Corresponding author.
67. Wang X, Yin D, Li P, Yin S, Wang L, Jia Y, **Shu X**. MicroRNA-Sequence Profiling Reveals Novel Osmoregulatory MicroRNA Expression Patterns in Catadromous Eel *Anguilla marmorata*. *PLoS One.* 2015;10(8):e0136383
66. **Shu X\***, Pang JJ, Zhang H, Mansfield D. Retinitis Pigmentosa: Disease Mechanisms, Diagnosis, and Therapies. *J Ophthalmol.* 2015;2015:819452.
65. Patnaik SR, Raghupathy RK, Zhang X, Mansfield D, **Shu X**. The Role of RPGR and Its Interacting Proteins in Ciliopathies. *J Ophthalmol.* 2015;2015:414781. \* Corresponding author.
64. Akhtar S, Patnaik RS, Raghupathy RK, Al-Mubrad TM, Craft JA, **Shu X\***. Histological characterization of the *Dicer1* mutant zebrafish retina. *J Ophthalmol.* 2015;2015:309510. \* Corresponding author.
63. Liu F, Chen J, Yu S, Raghupathy RK, Liu X, Qin Y, Li C, Huang M, Liao S, Wang J, Zou J, **Shu X**, Tang Z, Liu M. Knockout of RP2 decreases GRK1 and rod transducin subunits and leads to photoreceptor degeneration in zebrafish. *Hum Mol Genet.* 2015;24(16):4648-59.
62. Raghupathy RK, McCulloch DL, Akhtar S, Al-Mubrad TM, **Shu X\***. Pathogenesis of X-linked RP3: insights from animal models. *Adv Exp Med Biol.* 2014;801:477-85. \* Corresponding author.
61. Li C, Wang L, Zhang J, Huang M, Wong F, Liu X, Liu F, Cui X, Yang G, Chen J, Liu Y, Wang J, Liao S, Gao M, Hu X, **Shu X**, Wang Q, Yin Z, Tang Z, Liu M. CERKL interacts with mitochondrial TRX2 and protects retinal cells from oxidative stress-induced apoptosis. *Biochim Biophys Acta.* 2014;1842(7):1121-9
60. **Shu X**. Gene Therapy for X-Linked Retinitis Pigmentosa. *Clon Transgen* 3:e108. 2013, doi: 10.4172/2168-9849.1000e108
59. Raghupathy RK, Patnaik SR, **Shu X\***. Transgenic zebrafish models for understanding retinitis pigmentosa. *Clon Transgen*, 2013: 10. Doi:10.4172/2168-9849.1000110. \* Corresponding author.
58. Raghupathy RK, McCulloch DL, Akhtar S, Al-Mubrad TM, **Shu X\***. Zebrafish model for the genetic basis of X-linked retinitis pigmentosa. *Zebrafish*, 2013,10(1):62-69. \* Corresponding author.
57. Jiang J, Zhou Z, Patibandla S, **Shu X**. Pharmaceutical removal from wastewater by ferrate(VI) and preliminary effluent toxicity assessments by the zebrafish embryo model. *Microchem J*, 2013, 110:239-245
56. Ansari M, McKeigue PM, Skerka C, Hayward C, Rudan I, Vitart V, Polasek O, Armbricht A, Yates J, Vataavuk Z, Bencic G, Kolcic I, Oostra BA, Van Duijn CM, Campbell S, Stanton CM, **Shu X**, Khan JC, Shahid H, Harding SP, Bishop PN, Deary IJ, Moore AT, Dhillon B, Rudan P, Zipfel PF, Sim RB, Hastie ND, Campbell H, Wright AF. Genetic influences on plasma CFH and CFHR1 concentrations and their role in susceptibility to age-related macular degeneration. *Hum Mol Genet.* 2013; 22(23):4857-69.
55. **Shu X\***, Simpson JR, Hart A, Zeng Z, Patnaik SR, Gautier P, Murdoch E, Tulloch B, Wright AF. Functional characterisation of the human *RPGR* proximal promoter. *Invest Ophthalmol Vis Sci*, 2012,53(7):3951-8. \* Corresponding author.
54. Dinculescu A, Estreicher J, Zenteno JC, Aleman TS, Schwartz SB, Huang WC, Roman AJ, Sumaroka A, Li Q, Deng W, Min S, Chiodo VA, Neeley A, Liu X, **Shu X**, Matias-Florentino M, Buentello-Volante B, Boye SL, Cideciyan AV, Hauswirth WW, Jacobson SG. Gene Therapy for Retinitis Pigmentosa caused by *MFRP* (Membrane-type Frizzled Related Protein) Mutations: Human Phenotype and Preliminary Proof-of-Concept. *Hum Gene Ther.* 2012, 23, 367-76.

53. Dinour D, Gray NK, Ganon L, Knox AJ, Shalev H, Sela BA, Campbell S, Sawyer L, **Shu X**, Valsamidou E, Landau D, Wright AF, Holtzman EJ. Two novel homozygous SLC2A9 mutations cause renal hypouricemia type 2. *Nephrol Dial Transplant*, 2012, 27(3):1035-1041
52. **Shu X**, Luhmann U, Aleman TS, Barker SE, Lennon A, Tulloch B, Chen M, Xu H, Jacobson SG, Ali R, Wright A. Characterisation of Clqtnf5 Ser163Arg knock-in mouse model of late-onset retinal macular degeneration. *PLoS One*, 2011, 6, e27433.
51. Gakovic M, **Shu X**, Kasioulis I, Carpanini S, Moraga I, Wright AF. The role of RPGR in cilia formation and actin stability. *Hum Mol Genet*, 2011, 20, 4840-50
50. **Shu X**, Zeng Z, Gautier P, Lennon A, Gakovic M, Cheetham ME, Patton EE, Wright AF. Knock-down of the zebrafish orthologue of the retinitis pigmentosa 2 (RP2) results in retinal degeneration. *Invest Ophthalmol Vis Sci*, 2011, 52, 2960-2966
49. Vlachantoni D, Bramall AN, Murphy MP, Taylor RW, **Shu X**, Tulloch B, Veen TV, Turnbull DM, McInnes RR, Wright AF. Evidence of severe mitochondrial oxidative stress and a protective effect of low oxygen in mouse models of inherited photoreceptor degeneration. *Hum Mol Genet*, 2011, 20, 322-335
48. **Shu X**, Zeng Z, Gautier P, Lennon A, Gakovic M, Patton E, Wright AF. Zebrafish Rpgr is required for normal retinal development and plays a role in dynein-based retrograde transport process. *Hum Mol Genet*, 2010, 19, 657-670
47. Dinour D, Gray N, Campbell S, **Shu X**, Sawyer L, Richardson W, Rechavi G, Amariglio N, Ganon L, Sela B-A, Bahat H, Goldman M, Weissgarten J, Wright AF, Holtzman EJ. Homozygous loss-of-function mutations of GLUT9 cause severe renal hypouricemia. *J. Am. Soc. Nephrol*, 2010, 21, 64-72
46. **Shu X**, McDowall E, Brown A, Wright AF. The human Retinitis Pigmentosa GTPase Regulator gene variant database. *Hum Mutat*. 2008, 29, 605-608
45. Vitart V, Rudan I, Hayward C, Gray NK, Floyd J, Palmer CNA, Knott SA, Kolcic I, Polasek O, Graessler J, Wilson JF, Marinaki A, Riches PL, **Shu X**, Janicijevic B, Smolej-Narancic N, Gorgoni B, Morgan J, Campbell S, Biloglav Z, Barac-Lauc L, Pericic M, Martinovic Klaric I, Zgaga L, Skaric-Juric T, Wild SH, Richardson WA, Hohenstein P, Kimber CH, Tenesa A, Donnelly LA, Fairbanks LD, Aringer M, McKeigue PM, Ralston SH, Morris AD, Rudan P, Hastie ND, Campbell H, Wright AF. The major facilitator superfamily member SLC2A9 is a novel uric acid transporter influencing serum urate concentrations, urate excretion and gout. *Nat Genet*. 2008, 40, 437-442
44. Nan X, Hou J, Maclean A, Nasir J, Lafuente MJ, **Shu X**, Kriaucionis S, Bird A. Interaction between chromatin proteins MECP2 and ATRX is disrupted by mutations that cause inherited mental retardation. *Proc Natl Acad Sci U S A*. 2007, 104, 2709-2714
43. **Shu X**, Black GC, Rice JM, Hart-Holden N, Jones A, O'Grady A, Ramsden S, Wright AF. RPGR mutation analysis and disease-an update. *Hum Mutat*. 2007, 28, 322-328
42. **Shu X**, Clark SJ, Dodds AW, Slingsby F, Day AJ, Sim RB, Wright AF. ClqTNF5, which is mutated in late-onset retinal macular degeneration, interacts with complement factor H. *Mol Immunol*, 2007, 44, 240
41. Wright AF and **Shu X**. Focus on Molecules: RPGR. *Exp Eye Res*. 2007, 85, 1-2
40. **Shu X\***, Tulloch B, Lennon A, Vlachantoni D, Zhou X, Hayward C, Wright AF. Disease mechanisms in late-onset retinal macular degeneration associated with mutation in ClqTNF5. *Hum Mol Genet*, 2006, 15, 1680-1689 (\* **corresponding author**)
39. **Shu X**, Tulloch B, Lennon A, Hayward C, O'Connell M, Cideciyan AV, Jacobson SG, Wright AF. Biochemical characterisation of the ClqTNF5 gene associated with late-onset retinal degeneration. A genetic model of age-related macular degeneration. *Adv Exp Med Biol*. 2006, 572, 41-8.
38. **Shu X**, Zeng Z, Eckmiller MS, Gautier P, Vlachantoni D, Manson FDC, Tulloch B, Sharpe C, Gorecki DC, Wright AF. Developmental and tissue expression of *Xenopus laevis* RPGR. *Invest Ophthalmol Vis Sci*. 2006, 47, 348-356
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36. **Shu X**, Fry, AM, Tulloch B, Manson FDC, Crabb JW, Khanna H, Faragher AJ, Lennon A, Trojan P, Giessl A, Wolfrum U, Swaroop A, Vervoort R, Wright AF. RPGR ORF15 isoform co-localises with RPGRIP1 at centrioles and interacts with nucleophosmin. *Hum Mol Genet*, 2005,14, 1183-1197
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34. Wright AF, Reddick AC, Schwartz SB, Ferguson JS, Aleman TS, Kellner U, Jurklies B, Schuster A, Zrenner E, Wissinger B, Lennon A, **Shu X**, Cideciyan AV, Stone EM, Jacobson SG, Swaroop A. Mutation analysis of NR2E3 and NRL genes in Enhanced S Cone Syndrome. *Hum Mutat*. 2004, 24, 439
33. Hayward C\*, **Shu X\***, Cideciyan A, Lennon A, Barran P, Zareparsis S, Sawyer S, Hendry G, Dhillon B, Milam A, Luthert P, Swaroop A, Hastie A, Jacobson S and Wright A. Mutation in a short-chain collagen gene, *CTRP5*, results in extracellular deposit formation in late-onset retinal degeneration - a genetic model for age-related macular degeneration. *Hum. Mol. Genet*. 2003, 12, 2657-2667
- (\*joint First Authors)
32. Borges-Walmsley MI, Chen D, **Shu X**, Walmsley AR. The pathobiology of *Paracoccidioides brasiliensis*. *Trends Microbiol*. 2002, 10, 80-87
31. **Shu X**, Yi X, Zeng X, Zhang S. *Schistosoma japonicum* recombinant ferritin: expression and it's immunodiagnostic potential for evaluation of chemotherapeutic efficacy. *Chin J Parasit Dis Control*, 2000, 13 (2): 134-138
30. **Shu X**, Yi X, Zeng X. *Schistosoma japonicum*: evaluation of therapeutic efficacy by detection of specific IgG and IgG4 with antigens of different development stages. *Chin J Modern Medicine*, 10 (8): 6-8
29. **Shu X**, Yi X, Zeng X. Immunoscreening of phage random peptide library with sera from patients with schistosomiasis japonica. *J Cell Mol Immunol*, 2000, 16 (2): 109-112
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27. Zhang S, Yi X, **Shu X**, Li Z, Zeng Q, Zhou J, Zeng X. Evaluation of *Schistosoma japonicum* tegumental membrane antigen (SjMag) in immunodiagnosis and efficacy assessment. *Chin J Parasitol & Parasitic Dis*, 2000;18(2):69-72
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#### BOOK CHAPTER

1. Wright AF and **Shu X**. X-linked retinal dystrophies and microtubular functions within the retina. In: *Retinal degenerations: biology, diagnostics, and therapeutics*. (eds. Tombran-Tink J & Barnstable CJ). The Human Press, 2007, ISBN: 978-1-58829-620-78.

#### Patent

RPGR gene therapy for retinitis pigmentosa (WO2016014353)

<https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2016014353&recNum=157&docAn=US2015040866&queryString=nawab%20OR%20ikramullah%20OR%20khan&maxRec=6064>

#### INVITED TALKS

- Xinhua Shu** Dysregulation of cholesterol homeostasis in age-related macular degeneration. Shaoyang University, Shaoyang, China. December 2019.
- Xinhua Shu** Retinal ciliopathy: disease mechanisms and therapy. Hunan Provincial Institute of Reproductive Medicine, Changsha, China. December 2019
- Xinhua Shu** Therapeutic potential of gypenosides for retinal degeneration. Institute of Chinese Materia Medica, Hunan Academy of Chinese Medicine, Changsha, China. December 2019
- Xinhua Shu** Zebrafish model for retinal degeneration. Changsha University, Changsha, China. December 2019



**Xinhua Shu.** Mouse models for retinal degeneration. The 4<sup>th</sup> International Brain School, Isparta, Turkey. June 2019

**Xinhua Shu** Development of antioxidant therapeutic strategies for age-related macular degeneration. The International Society of Antioxidants in Nutrition and Health 21<sup>st</sup> Redox congress, Muscat, Oman. March 2019

**Xinhua Shu.** The translocator protein, TSPO, a therapeutic target for age-related macular degeneration. Henan Eye Institute, Henan, China. October 2018

**Xinhua Shu.** Imbalance of retinal cholesterol homeostasis in age related macular degeneration. Jinan University, Guangzhou, China. April 2017

**Xinhua Shu.** Evaluation of the therapeutic potential of gypenoside for retinal degeneration. The 2nd International Symposium on Phytochemicals in Medicine and Food, Fuzhou, China. April 2017

**Xinhua Shu.** A colour preference technique to evaluate the toxicity of acrylamide in zebrafish. The 30<sup>th</sup> ESCPB, Barcelona, Spain. September 2016

**Xinhua Shu.** Developing therapeutic drugs for retinal degeneration using a zebrafish model. Jinan University, Guangzhou, China. January 2016.

**Xinhua Shu.** Disease mechanisms and therapy of retinal ciliopathies. Ningbo University, Ningbo, China. January 2016.

**Xinhua Shu.** A genetic model for age related macular degeneration. Universita Politecnica delle Marche, Ancona, Italy. December 2015.

**Xinhua Shu.** Gene therapy for retinitis pigmentosa. Universita Politecnica delle Marche, Ancona, Italy. November 2015.

**Xinhua Shu.** Development of new drugs for retinal degeneration using a zebrafish model. Universita Politecnica delle Marche, Ancona, Italy. September 2015.

**Xinhua Shu.** NoPILLS project: evaluation of ecotoxicity of pharmaceuticals in Zebrafish. The 9<sup>th</sup> European Zebrafish meeting. Oslo, Norway, June 2015.

**Xinhua Shu.** New disease mechanisms involve in the pathogenesis of retinitis pigmentosa. The APAO Congress 2015. Gunagzhou, China. April 2015

**Xinhua Shu.** zebrafish model for Leber's congenital amaurosis. Yorkhill Research Day 2014, Glasgow, October 2014

**Xinhua Shu.** Elucidating disease mechanisms of retinitis pigmentosa in zebrafish model. The 29<sup>th</sup> ECSPB, Glasgow. 1-4 September 2014.

**Xinhua Shu.** Disease mechanisms of ciliopathies. Glasgow Neuroscience Day. 17<sup>th</sup> January 2014.

**Xinhua Shu** Function of RPGR in the pathogenesis of X-linked retinitis pigmentosa. The 9<sup>th</sup> International symposium of Ophthalmology. Guangzhou, China November 2013

**Xinhua Shu.** Functional characterization of retinitis pigmentosa causing RPGR mutations. European Association for Vision and Eye Research 2013, 18-21 September 2013, Nice, France

**Xinhua Shu.** Understanding the pathogenesis of retinal degeneration: from human to zebrafish, University of Science and Technology of China. December 2011

**Xinhua Shu.** Disease mechanisms in retinopathies, Hunan University of Traditional Chinese Medicine. China. December 2011

**Xinhua Shu.** Zebrafish as a model for human diseases and drug discovery, Hunan Agricultural University. China. December 2011

**Xinhua Shu.** A genetic model for age related macular degeneration, Glasgow Caledonian University. April 2011

**Xinhua Shu.** Disease mechanisms of the X-linked retinitis pigmentosa, Glasgow Caledonian University. December 2010

**Xinhua Shu.** Insight into the pathogenesis of retinal degeneration, Gartnavel General Hospital, Glasgow. June 2010

**Xinhua Shu.** Late-on-set Retinal Macular Degeneration, a Genetic Model for Age Related Macular Degeneration. XIIIth International Symposium on Retinal Degeneration, China. September 2008

**Xinhua Shu.** Pathomechanisms in Retinal Degeneration. Eye Institute & Xiamen Eye Centre, Xiamen University, China. September 2008

**Xinhua Shu.** John Scrimgeour Non-Clinical Lecture: Insights into the pathogenesis of age-related macular degeneration, Western General Hospital, Edinburgh. April 2007

**Xinhua Shu.** C1QTNF5 is mutated in late-onset retinal macular degeneration and interacts with complement factor H. XXI International Complement Workshop, China. October 2006

**Xinhua Shu.** Disease Mechanism of Retinal Degeneration. University of Durham, UK. March 2006

**XinhuaShu.** Mechanism for extracellular deposit formation in autosomal dominant disorder resembling age-related macular degeneration. 12<sup>th</sup> CLSS meeting in University College London. September 2005

## **REVIEW EXPERIENCES**

**Editorial board:** Advances in Medicine; American Journal of Biomedical Research; Cloning & Transgenes; EC Ophthalmology; Journal of Coastal Life Medicine; Journal of Chemistry and Applications; Journal of Ocular Biology; New Journal of Science; Scientific Reports.

**Guest editor:** Journal of Ophthalmology.

**Reviewer for journals:** 3Biotech; Acta Histochemica; American Journal of Biomedical Research; Antioxidants; BBA - Molecular Basis of Disease; Bioscience Reports; Breast Cancer Research and Treatment; Biological Trace Element Research; British Journal of Dermatology; Chemosphere; Clinical Ophthalmology; Clinical and Experimental Ophthalmology; Current Medicinal Chemistry; Current Molecular Medicine; Current Nutrition & Food Science; Ecotoxicology and environmental safety; Environmental Toxicology and Pharmacology; Experimental and Therapeutic Medicine; Experimental Cell Research; Experimental Eye Research; Eye and Vision; Expert Opinion On Therapeutic Targets; Food and Chemical Toxicology; Food and Function; Free Radical Biology and Medicine; Free Radical Research; Gene; Frontiers in Cell and Developmental Biology; Frontiers in Genetics; Frontiers in Pharmacology; Frontiers of Medicine; Graefe's Archive for Clinical and Experimental Ophthalmology; Hypertension; Inflammation; Investigative Ophthalmology & Visual Science; Journal of Agricultural and Food Chemistry; Journal of Cellular Physiology; Journal of Comparative Neurology; Journal of Hazardous Materials; Journal of Pharmaceutical Technology and Drug Research; Journal of Pharmacology and Clinical Toxicology; Journal of Receptors and Signal Transduction; Journal of the Royal Society Interface; Journal of Visualized Experiments; Materials Science & Engineering C; Medical Science Monitor; Molecular Vision; Molecules, Nature Communication; Neural Regeneration Research; Neuro-Ophthalmology & Visual Neuroscience; Neurotoxicity Research; Oxidative Medicine and Cellular Longevity; Peer J; Pharmaceutical and Biomedical Research, PLOS One; Scientific Reports; Vision.

**For Funding bodies:** BBSRC, MRC, Fight for Sight, Kuwait Foundation for the Advancement of Sciences, Macular Society, Moorfields Eye Charity, National Natural Science Foundation of China, the Rosetrees Trust.

**Committee member:** The Scientific Committee of the 29th ESCPB 2014 Congress

## **EXAMINING POSTGRADUATE STUDENTS**

**2** MPhil students and **5** PhD students.

## **TEACHING**

Supervise Postdoctoral scientist, Research Assistants, technicians, PhD and MSc/MRes students. Eight PhD students have successfully finished their study under Dr Shu's supervision.

Teaching Biology of Disease, Essential Molecular Biology, Fundamental cell Biology, Mechanisms of cellular Regulation, Molecular Diagnosis, and Advanced Forensic Biology modules for undergraduate students; running workshops for undergraduate and MSc students; supervising Honour students' research projects and dissertations.

## **AWARDS**

2015 Visiting Professorship (three months), the Università Politecnica delle Marche, Italy

2015 Erasmus Mundus Programme International Mobility Programme for Academic and Knowledge Transfer Scholarship (one month for visiting Ningbo University, China)

2010 Caledonian Associate (teaching), GCU

2007 John Scrimgeour Non-Clinical Lectureship

2006 Young Investigator Award, the XXI International Complement Workshop, the International Complement Society

2004 Young Investigators Award, the XIth International Symposium on Retinal Degeneration, National Eye Institute, NIH

2003 Third Prize, Awarded with Progress Prizes on Science and Technology by Hunan Province

1999 Wellcome Trust Travelling Fellowship

1998 Third Prize, Awarded with Progress Prizes on Science and Technology by Hunan Province

1997 Third Prize, Awarded with Progress Prizes on Science and Technology by Hunan province