Brief Curriculum Vitae (August 2012)

Professor Robin Ali PhD FMedSci

Qualifications

2007 FMedSci (Elected) UK Academy of Medical Sciences
1993 PhD Genetics, University College London
1988 BSc Genetics, University College London

Professional History

2011 -	Theme leader (Gene Therapy), NIHR Biomedical Research Centre, Moorfields Eye Hospital
2008 -	Head of Research Department (Genetics) UCL Institute of Ophthalmology
2007 -	Faculty, NIHR Biomedical Research Centre at Moorfields Eye Hospital
2006 -	Management Board, UCL Institute of Ophthalmology
2003 -	Professor of Human Molecular Genetics, UCL Institute of Ophthalmology & UCL Institute of Child Health (joint appointment)
2001 - 2003	Reader in Physiology, UCL Institute of Ophthalmology
1999 - 2001	Lecturer, UCL Institute of Ophthalmology
1994 - 1998	Senior Research Fellow, UCL Institute of Ophthalmology
1992 - 1994	Postdoctoral Scientist, MRC National Institute for Medical Research, London

Other Appointments and Affiliations

(i) Funding Boards: From 2012 Telethon Italy, Scientific Committee **2011 -** L'Agence nationale de la recherché (ANR), France, (University Hospital Institutes Jury) **From 2011** UK Medical Research Council (Translational Stem Cell Committee) From **2010** UK Medical Research Council (Neuroscience and Mental Health Board) **2009** Health Research Board, Ireland (Molecular and Cellular Medicines Committee) **2008 -** Fighting Blindness, Ireland (Chief Scientific Advisor) **2006** UK Multiple Sclerosis Society (Advisory Board for Myelin Repair Centres, Edinburgh & Cambridge) **(ii) Editorial Boards: From 2008** Gene Therapy (Associate Editor from 2011) **From 2007** Expert Review of Ophthalmology **From 2005** Regenerative Medicine **2002 – 2006** British Journal of Ophthalmology **(iii) International Societies: From 2011** Board member European Society of Gene and Cell Therapy **2008 - 2011** UK Academy of Medical Sciences - Sectional Committee (Biochemistry, Molecular Biology, Immunology, Microbiology, Genetics and Developmental Biology) **(iv) Prize Committees: 2011** Foukes Foundation Medal Committee **2010** Sir Jules Thorn Charitable Trust Biomedical Research Award Committee **(v) Industrial Advisory Boards: From 2012** Retina Institute Japan, Kyoto, Scientific Advisory Board; **2011** Regeneron Inc., New York, USA, Consultant **From 2011** ReGenX BioSciences LLC, Washington USA, Medical Advisory Board **From 2010** Alcon Pharmaceuticals, Ft Worth USA, Scientific Advisory Board **2007** Third Rock Ventures, New York, Consultant **2005 – 2007** Amsterdam Molecular Therapeutics, Netherlands, Scientific Advisory Board From **2002** Oxford Biomedica PLC, Oxford UK, Consultant **(vi) International Meeting Committees: From 2011** Board member of European Society of Gene and Cell Therapy **From 2010** American Society of Gene and Cell Therapy – Neurologic and Ophthalmic Gene and Cell Therapy Committee **From 2007** British Society for Gene and Cell Therapy – Program Organisation Committee **From 2007** European Society of Gene and Cell Therapy – Scientific Committee on Genetic and Metabolic Diseases

Invited Lectures

Over the last 10 years I have been given over 50 invited presentations at international meetings in USA, Europe, Middle East, Japan and Australia. I have received regular invitations to speak at annual meetings of American Society of Gene and Cell Therapy and European Society of Gene and Cell Therapy as well as international meetings on vision/ophthalmology, including FASEB and Gordon Research Conferences

KeyNote and Named Lectures

2012 Pascol Rol Keynote Lecture, SPIE XXII Ophthalmic Technologies Conference, San Francisco **2011** Asia Association for Vision Research and Ophthalmology, Singapore; 18th International Chromosome Conference, Manchester, UK; COBRE Distinguished Vision Lecture, University of Oklahoma **2010** Elsemay Bjorn Lecture (Finnish Association for Eye Research), Tampere, Finland**;** Annual Congress of Japanese Ophthalmology, Kobe, Japan; Gordon Research Conference on Visual System Development, Barga Italy **2008** Cole Eye Distinguished Lecture, Cleveland Clinic, Ohio **2005** Jesse Mole Lecture, University of Oxford **2006** British Association of Optometry Annual Meeting **2004** Fincham Lecture, City University of London.

International Prizes/Awards/Academy memberships

2010 ARVO/Pfizer Carl Camras Translational Research Award ($10k unrestricted personal award); **2009** Election to the Alcon Research Institute - Alcon Research Institute Award ($200k unrestricted personal award). Elected as Senior Investigator, UK National Institute of Health Research – Senior Investigator Award; Foundation Fighting Blindness (USA) - Board of Directors Award. To recognise seminal contribution to the development of gene therapy for treatment of retinal dystrophies **2008** Foulkes Foundation Medal (Academy of Medical Sciences). To recognise outstanding contribution to biomedical research by individuals at an early stage in their career (under 45 years) **2007** Election to Academy of Medical Sciences (UK) **2005** Jesse Mole Medal (British Retinitis Pigmentosa Society) **2004** Fincham Medal (The Worshipful Company of Spectacle Makers)

Current grants

The Medical Research Council **Using cell surface antigens for the isolation of photoreceptor precursor cells for retinal cell therapy* J Sowden and RR Ali; £450,000 10/10- 09/13 **Development of cell therapy to restore photopic vision* RR Ali, J Sowden and R Pearson; £2,272,786 01/12-12/16 **Modulating the local immune environment via gene transfer to surpress intraocular inflammation* Fellowship (C Chu); £228,000 08/11-08/14 **Development of an AAV vector for treatment of inherited retinal dystrophy caused by RPE65 deficiency* RR Ali & J Bainbridge; £304,000 11/11-10/13
The Wellcome Trust ** Retinal repair using ES-derived photoreceptor precursors* studentship (A Gonzalez-Cordero); £130,500 10/09-09/12 ** UCL Gene Therapy Centre (Biomedical Resources Award)* MC Collins, D Linch, A Nathwani, AJ Thrasher RR Ali, H Stauss; £1,700,000 1/08-12/12 *******Retinal repair: Mechanisms of photoreceptor precursor cell integration* R Pearson and RR Ali; £240,000 05/09-04/12
National Institute for Health Research **National Institute for Health Research UCL Institute of Ophthalmology and Moorfields Eye Hospital Biomedical Research Centre - Gene Therapy Theme* RR Ali £2,100,000 04/12-03/17 **NIHR Senior Investigator Award* RR Ali; £60,000 04/09-03/14 **CLRN Contingency Fund – An open-label dose escalation study of an AAV for gene therapy in severe early onset retinal degeneration* RR Ali & J Bainbridge; £36,982 06/10-05/13
RP Fighting Blindness **Photoreceptor replacement therapy and gliosis: development of strategies to improve cell integration* R Pearson and RR Ali; £190,000 02/10-01/13 *BRPS centre for the development of gene therapy for inherited retinal dystrophies RR Ali, J Bainbridge & M Michaelides; £853,516 08/11-07/16
Biotechnology and Biological Sciences Research Council *An evolutionary restricted role for purinergic signalling in the maintenance of retinal stem cells R Pearson, RR Ali and J Sowden; £403,500 01/11-12/13
European Union *FP7: *A treatment-oriented research project of NCL disorders as a major cause of dementia in childhood* RR Ali (collaborative grant of €3,000,000); €182,000 11/11-10/14
Fight for Sight **Gene-based induction cell replication: ex vivo and in vitro analysis* RR Ali and F Larkin (Studentship); £93,000 1/10-12/12
Special Trustees Moorfields Eye Hospital **Development of ocular gene therapy: towards a programme of clinical trials* RR Ali, L Da Cruz and JW Bainbridge*;* £300,000 2/08-03/13 **Salary support for gene therapy research manager* J Bainbridge & RR Ali; £52,174, 06/10-05/13
Rosetrees Trust / UCL Therapeutic Innovation Fund **Development of a novel therapeutic antibody* J Bainbridge, T Sepp and RR Ali; £50,000 05/11-04/12

Research record

I was first to demonstrate efficient AAV-mediated photoreceptor transduction (Hum Mol Genet, 1996). I then optimised production of vectors and efficiency of transduction, including development of new vector systems (Nature Med, 2006) and was also first to demonstrate functional rescue of a mouse model of retinitis pigmentosa. This established POC for ocular gene therapy (Nature Genet, 2000). Over the next 10 years, I demonstrated POC for gene therapy for a wide range of ocular disorders, with effective rescue of 10 animal models of retinal dystrophy, as well as demonstrating POC for gene therapy for ocular angiogenesis and uveitis. In doing so, I have established a pipeline of therapies, supported by charities, NIHR, MRC and industry that is feeding into a growing portfolio of clinical trials. As chief investigator, I established the world's first clinical trial of gene therapy for retinopathy. The results from this trial reporting an improvement in vision (NEJM, 2008), along with results from two other trials, established proof of principle of gene therapy for inherited retinal degeneration and are widely regarded as a landmark for the whole gene therapy field. More recently, I have provided the first POC for photoreceptor transplantation with the key discovery that transplantation of rod precursor cells at a specific stage of development results in integration and differentiation into rod photoreceptors that form synaptic connections in the retina (Nature, 2006). We have spent 5 years improving efficiency and recently demonstrated that photoreceptor transplantation improves vision in a mouse model of visual dysfunction (Nature, 2012). These studies provide the first POC for effective transplantation of neurons and provide the basis for ES cell-derived photoreceptor transplantation - now a major programme in my laboratory.

Selected Publications

Published over 130 papers since 1996; > 5300 citations; H-index of 40; Between 1998-2009, 16th most cited European researcher in eye/vision/ophthalmology research and youngest on list see http://www.vision-research.eu/index.php?id=686)

1. Restoration of vision following transplantation of photoreceptors. RA Pearson, AC Barber, M Rizzi, C Hippert, T Xue, EL West, Y Duran, AJ Smith, JZ Chuang, SA Azam, UFO Luhmann, A Benucci, CH Sung, JW Bainbridge, M Carandini, KW Yau, JC Sowden, RR Ali ***Nature*** 2012 **485** (7396): 99-103

2. Von Hippel-Lindau protein in the RPE is essential for normal ocular growth and vascular development. CAK Lange, UFO Luhmann, FM Mowat, EL West, H Sayed, AJ Smith, JC Sowden, PH Maxwell, RR Ali and JW Bainbridge. ***Development*** 2012 **139** (13): 2340-50

3. Analysis of the transplantation competence of ES cell-derived retinal cell populations. EL West, A Gonzalez-Cordero, C Hippert, F Osakada, RA Pearson, JC Sowden, M Takahashi, RR Ali ***Stem Cells*** 2012; **30** (7): 1424-35

4. Long-term and age-dependent restoration of visual function in a mouse model of CNGB3-associated achromatopsia following gene therapy. LS Carvalho, J Xu, RA Pearson, AJ Smith, JW Bainbridge, LM Morries, SJ Fliesler, XQ Ding and RR Ali. ***Hum Mol Genet.*** 2011; **20** (16): 3161-75

5. Long-term preservation of cones and improvement in visual function following gene therapy in a mousemodel of Leber congenital amaurosis (LCA) caused by GC1 deficiency. M Mihelec, RA Pearson, SJ Robbie, PK Buch, WB Bainbridge, AJ Smith and RR Ali ***Human Gene Therapy*** 2011; **22** (10): 1179-90

6. Cone and rod photoreceptor transplantation in models of the childhood retinopathy Leber congenital amaurosis using flow-sorted Crx-positive donor cells. J Lakowski, M Baron, JW Bainbridge, AC Barber, RA Pearson, RR Ali and JC Sowden. ***Hum Mol Genet.*** 2010; **19** (23): 4545-59

7. Long term survival of photoreceptors transplanted into the adult murine neural retina requires immune modulation. EL West, RA Pearson, SE Barker, UF Luhmann, RE MacLaren, AC Barber, Y Duran, AJ Smith, JC Sowden and RR Ali. ***Stem Cells.*** 2010; **28** (11): 1997-2007

8. Adult ciliary epithelial cells, previously identified as retinal stem cells with potential for retinal repair fail to differentiate into new rod photoreceptors. S Gualdoni, M Baron, J Lakowski, S Decembrini, AJ Smith, RA Pearson, RR Ali, JC Sowden. ***Stem Cells*** 2010; **28** (6): 1048-59.

9. Targeted disruption of outer limiting membrane junctional proteins (Crb1 and ZO-1) increases integration of transplanted photoreceptor precursors into the adult wild-type and degenerating retina. Pearson RA, Barber AC, West EL, MacLaren RE, Duran Y, Bainbridge JW, Sowden JC, Ali RR ***Cell Transplant.*** 2010; **19** (4): 487-503.

10. Gene therapy for retinitis pigmentosa and Leber congenital amaurosis caused by defects in AIPL1: effective rescue of mouse models of partial and complete Aipl1 deficiency using AAV2/8 vectors. MH Tan, AJ Smith, B Pawlyk, X Xu, X Liu, JW Bainbridge, M Basche, J McIntosh, HV Tran, A Nathanwi, T Li and RR Ali ***Hum Mol Genet*** **.** 2009; **18** (12): 2099-114

11. Effect of gene therapy on visual function in Leber Congenital Amaurosis. JWB Bainbridge, AJ Smith, SE Barker, S Robbie, R Henderson, KS Balaggan, A Viswanathan, GE Holder, A Stockman, N Tyler, S Petersen-Jones, SS Bhattacharya, AJ Thrasher, FW Fitzke, BJ Carter, GS Rubin, AT Moore and RR Ali ***N Engl J Med.*** 2008; **358** (21): 2231-9

12. Effective gene therapy with non-integrating lentiviral vectors. RJ Yáñez-Muñoz, KS Balaggan, A MacNeil, S Howe, M Schmidt, AJ Smith, P Buch, RE MacLaren, PN Anderson, SE Barker, Y Durán, C Bartholomae, C Von Kalle, JR Heckenlively, C Kinnon, RR Ali and AJ Thrasher ***Nature Med.*** 2006; **12** (3) :348-353

13. Retinal repair by transplantation of photoreceptor precursors. RE MacLaren, RA Pearson, A MacNeil, RH Douglas, TE Salt, M Akimoto, A Swaroop, JC Sowden and RR Ali ***Nature*** 2006; **444** (7116): 203-207

14. Gene therapy of X-linked severe combined immunodeficiency by use of a pseudotyped gammaretroviral vector. HB Gaspar, KL Parsley, S Howe, D King , KC Gilmour, J Sinclair, G Brouns, M Schmidt, C Von Kalle, T Barington, M Jakobsen, HO Christensen, A Al Ghonaium, HN White, JL Smith, RJ Levinsky, RR Ali, C Kinnon and AJ Thrasher ***Lancet*** 2004; **364** (9452): 2181-2187

15. Intraocular gene delivery of ciliary neurotrophic factor results in significant loss of retinal function in normal mice and in the Prph2Rd2/Rd2 model of retinal degenration. FC Schlichtenbrede, A McNeil, AJ Smith, M Tschernutter, JWB Bainbridge and RR Ali ***Gene Ther.*** 2003; **10** (6): 523-527

16. AAV-mediated gene transfer slows photoreceptor loss in the RCS rat model of retinitis pigmentosa. AJ Smith, FC Schlichtenbrede, M Tschernutter, JW Bainbridge, AJ Thrasher and RR Ali ***Mol. Ther.*** 2003; **8** (2): 118-195

17. Inhibition of retinal neovascularisation by gene transfer of soluble VEGF receptor sFlt-1. JWB Bainbridge, A Mistry, M De Alwis, E Paleolog, A Baker, AJ Thrasher and RR Ali ***Gene Ther.*** 2002; **9** (5): 320-326

18. Gene replacement therapy in the retinal degeneration slow (rds) mouse: the effect on retinal degeneration following a partial transduction of the retina. G Sarra, C Stephens, M de Alwis, JWB Bainbridge, AJ Smith, AJ Thrasher and RR Ali ***Hum. Mol. Genet.*** 2001; **10** (21): 2353-2361

19. Restoration of photoreceptor ultrastructure and function in retinal degeneration slow mice by gene therapy. RR Ali, G Sarra, C Stephens, M de Alwis, JWB Bainbridge, PM Munro, S Fauser, MB Reichel, C Kinnon, DM Hunt, SS Bhattacharya and AJ Thrasher ***Nature Genet.*** 2000; **25** (3): 306-310

20. Gene transfer into the mouse retina mediated by an adeno-associated viral vector. RR Ali, MB Reichel, AJ Thrasher, RJ Levinsky, C Kinnon, N Kanuga, DM Hunt and SS Bhattacharya ***Human Mol. Genet.*** 1996; **5** (5): 591-594