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UK Biobank Eye and Vision Consortium Newsletter

UK Biobank Repeat Imaging Study

In 2014, UK Biobank launched the world's largest multimodal imaging study, including the brain, heart and abdominal MRI, whole-body DEXA and carotid Doppler ultrasound on 100,000 participants. Up to 60,000 of the 100,000 participants will be re-invited to undergo a complete repeat of the imaging enhancement between 2022 and 2028.

The following eye measures will also be added to the anticipated UK Biobank Repeat Imaging (Re-Imaging) Study:

- Topcon Triton OCT
- Autorefraction
- Keratometry
- Broken letter reading

There has been strong support for including eye measures in the Repeat Imaging Study. Consortium members Denize Atan, Paul Foster (Chair), Anthony Khawaja, Tom McGillivray, Chris Owen, Praveen Patel, Axel Petzold, Alicja Rudnicka have worked with UK Biobank to secure a multi-million pound award from a US-based foundation that will fund eye measures in the Whole Body Re-Imaging Study that is due to start mid-2022 at three sites around England. The proposal was focused on providing data on potential ophthalmic "biomarkers" of accelerated cognitive ageing and early cognitive decline, although it will generate important data on diseases affecting eyes and vision. UK Biobank will be making a media announcement when the project launches.

PUBLICATION NEWS

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The consortium members have published 27 papers since 2020. Congratulations!

1. Multitrait analysis of glaucoma identifies new risk loci and enables polygenic prediction of disease susceptibility and progression. Craig J.E, Han X, Qassim A, et al; UK Biobank Eye and Vision Consortium. *Nature Genetics* [\[PDF\]](#)
2. Genome-wide association meta-analysis of corneal curvature identifies novel loci and shared genetic influences across axial length and refractive error. Qiao F, Pozarickij A, Tan N.Y.Q, et al; UK Biobank Eye and Vision Consortium. *Communications Biology* [\[PDF\]](#)
3. Non-additive (dominance) effects of genetic variants associated with refractive error and myopia. Pozarickij A, Williams C, Guggenheim J.A, et al; UK Biobank Eye and Vision Consortium. *Molecular Genetics and Genomics* [\[PDF\]](#)
4. Meta-analysis of 542,934 subjects of European ancestry identifies new genes and mechanisms predisposing to refractive error and myopia. Hysi P.G, Choquet H, Khawaja A.P, et al; UK Biobank Eye and Vision Consortium. *Nature Genetics* [\[PDF\]](#)
5. Ambient Air Pollution Associations with Retinal Morphology in the UK Biobank. Chua SYL, Khawaja AP, Dick AD, et al; UK Biobank Eye and Vision Consortium. *Investigative Ophthalmology & Visual Science* [\[PDF\]](#)
6. Effect of Education on Myopia: Evidence from the United Kingdom ROSLA 1972 Reform. Plotnikov D, Williams C, Atan D, et al; UK Biobank Eye and Vision Consortium. *Investigative Ophthalmology & Visual Science* [\[PDF\]](#)
7. The Role of Chromosome X in Intraocular Pressure Variation and Sex-Specific Effects. Simcoe MJ, Khawaja AP, Mahroo OA, et al; UK Biobank Eye and Vision Consortium. *Investigative Ophthalmology & Visual Science* [\[PDF\]](#)
8. Genome-wide association study of corneal biomechanical properties identifies over 200 loci providing insight into the genetic etiology of ocular diseases. Simcoe MJ, Khawaja AP, Hysi PG, et al; UK Biobank Eye and Vision Consortium. *Human Molecular Genetics* [\[PDF\]](#)
9. Retinal asymmetry in multiple sclerosis. Petzold A, Chua SYL, Khawaja AP, et al; UK Biobank Eye and Vision Consortium. *Brain* [\[PDF\]](#)
10. Retinal Vascular Tortuosity and Diameter Associations with Adiposity and Components of Body Composition. Tapp RJ, Owen CG, Barman SA, et al; UK Biobank Eye and Vision Consortium. *Obesity* [\[PDF\]](#)
11. Relationships between retinal layer thickness and brain volumes in the UK Biobank cohort. Chua SY, Lascaratos G, Atan D, et al; UK Biobank Eye and Vision Consortium. *European Journal of Neurology* [\[PDF\]](#)
12. Association of ambient air pollution with age-related macular degeneration and retinal thickness in UK Biobank. Chua SYL, Warwick A, Peto T, et al; UK Biobank Eye and Vision Consortium. *British Journal of Ophthalmology* [\[PDF\]](#)
13. Association Between Medication-Taking and Refractive Error in a Large General Population-Based Cohort. Patasova K, Khawaja AP, Tamraz B, et al; UK Biobank Eye and Vision Consortium. *Investigative Ophthalmology & Visual Science* [\[PDF\]](#)
14. Investigation of associations between retinal microvascular parameters and albuminuria in UK Biobank: a cross-sectional case-control study. Paterson EN, Cardwell C, MacGillivray TJ, et al; UK Biobank Eye and Vision Consortium. *BMC Nephrology* [\[PDF\]](#)
15. Socioeconomic risk factors and age-related macular degeneration in the UK Biobank study. Yip JLY, Muthy Z, Peto T, et al; UK Biobank Eye and Vision Consortium. *BMJ Open Ophthalmology* [\[PDF\]](#)
16. Evaluation of Shared Genetic Susceptibility to High and Low

- Myopia and Hyperopia. Tideman JW, Pärssinen O, Haarman AEG, et al; UK Biobank Eye and Vision Consortium. JAMA Ophthalmology [\[PDF\]](#)
17. Macular thickness varies with age-related macular degeneration genetic risk variants in the UK Biobank cohort. Kaye RA, Patasova K, Patel PJ, Hysi P, Lotery AJ; UK Biobank Eye and Vision Consortium. Scientific Reports. [\[PDF\]](#)
18. The Association of Ambient Air Pollution With Cataract Surgery in UK Biobank Participants: Prospective Cohort Study. Chua SYL, Khawaja AP, Desai P, et al. Investigative Ophthalmology & Visual Science [\[PDF\]](#)
19. Visual impairment and risk of dementia in two population-based prospective cohorts: UK Biobank and EPIC-Norfolk. Littlejohns TJ, Hayat S, Luben R, et al. Journals of Gerontology: Biological Sciences [\[PDF\]](#)
20. Impact of Persisting Amblyopia on Socioeconomic, Health, and Well-Being Outcomes in Adult Life: Findings From the UK Biobank. Bountziouka V, Cumberland PM, Rahi JS. Value Health. [\[PDF\]](#)
21. Genetic variation affects morphological retinal phenotypes extracted from UK Biobank optical coherence tomography images. Currant H, Hysi P, Fitzgerald TW, et al. PLoS Genetics [\[PDF\]](#)
22. Hyperopia Is Not Causally Associated With a Major Deficit in Educational Attainment. Plotnikov D, Sheehan NA, Williams C, et al; UK Biobank Eye and Vision Consortium. Translational Vision Science & Technology [\[PDF\]](#)
23. Associations of sleep apnoea with glaucoma and age-related macular degeneration: an analysis in the United Kingdom Biobank and the Canadian Longitudinal Study on Aging. Han X, Lee SS, Ingold N, et al. BMC Medicine [\[PDF\]](#)
24. Automated Detection of Glaucoma With Interpretable Machine Learning Using Clinical Data and Multimodal Retinal Images. Mehta P, Petersen CA, Wen JC, et al; UK Biobank Eye and Vision Consortium. American Journal of Ophthalmology [\[PDF\]](#)
25. Genome-wide meta-analysis identifies 127 open-angle glaucoma loci with consistent effect across ancestries. Gharahkhani P, Jorgenson E, Hysi P, et al. Nature Communications [\[PDF\]](#)
26. Alcohol Consumption and Incident Cataract Surgery in Two Large UK Cohorts. Chua SYL, Luben RN, Hayat S, et al; UK Biobank Eye and Vision Consortium. Ophthalmology [\[PDF\]](#)
27. Associations of Alcohol Consumption and Smoking with Disease Risk and Neurodegeneration in Individuals With Multiple Sclerosis in the United Kingdom. Kleerekooper I, Chua S, Foster PJ, et al; UK Biobank Eye and Vision Consortium. JAMA Network Open [\[PDF\]](#)

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NEW MEMBERS

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We would like to welcome these new members to the consortium.

Richard Oram [\[view details\]](#)

Professor Richard Oram is a Diabetes UK Harry Keen Fellow at the Institute of Biomedical and Clinical Science and NIHR Exeter Clinical Research Facility. His research interests and experience include the study of beta-cell loss in type 1 diabetes, biomarkers, genetics and the development of the type 1 diabetes genetic risk score.

Graeme Black [\[view details\]](#)

Graeme is Professor and Honorary Consultant in Genetics and Ophthalmology at Central Manchester University Hospitals NHS Foundation Trust. His major research interest is the investigation of genetic disorders associated with visual disability.

Panagiotis Sergouniotis [\[view details\]](#)

Dr Sergouniotis is a Wellcome Clinician Scientist at the University of Manchester and a Consultant in Paediatric Ophthalmology at the Manchester Royal Eye Hospital and the Manchester Centre for Genomic Medicine, UK.

Tasane Braithwaite [\[view details\]](#)

Dr Braithwaite is a consultant ophthalmologist specialising in the diagnosis and management of inflammatory eye disease and neuro-ophthalmic disorders. She holds a dual appointment as an adjunct and honorary senior lecturer in the School of Immunology and Microbial Sciences, and the School of Life Course Sciences, King's College London.

Mike Weedon [[view details](#)]

Dr Weedon is an associate professor working on the genetics of diabetes and related traits. This involves the study of common complex diseases such as Type 2 diabetes using GWAS to identify new common genetic variant associations, as well as whole-genome sequencing approaches to identify rare mutations causing familial diabetes.

CONSORTIUM AUTHORSHIP OR RECOGNITION

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Several consortium members have experienced challenges in trying to ensure recognition of the group's contribution to creating the data set. The approaches to overcoming this, based on past experience, seem to vary between different manuscript submissions, even with the same journal, through the same editorial office. Therefore, it appears that we need to adopt a flexible approach to this challenge.

The different approaches are to:

1. Name of the consortium as an author if this is felt appropriate
2. Add the statement at the end of the by-line that the work was carried out "For" or "On behalf of" the UK Biobank Eye and Vision Consortium.

An up-to-date list of members' names and affiliations is maintained on the consortium website. For advice or support on this matter, or for a detailed listing of all authors, please contact Paul Foster (p.foster@ucl.ac.uk).

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