ENRICHING ENGAGEMENT: AWARDEES

August 2020: seven projects have been awarded funding in Round 2 of the Enriching Engagement award, a pilot grants programme (£10k - £100k) open to Wellcome grant holders and awardees at the University of Oxford to develop and deliver Public Engagement with Research projects. This follows the announcement of six successful projects funded in Round 1, awarded in November 2019. Summaries of all projects are below.

Enriching Engagement awardees: Round 2 (awarded July 2020)

PI: Dr Catherine Manning (Experimental Psychology, Oxford)
Project team: Dr Brett Heasman (UCL), Becky Lyddon (Sensory Spectacle), Emily (21andsensory)
"Sensory Street" – immersive experience
£91,916.72

Autistic individuals often experience sensory symptoms, like discomfort under fluorescent lights or heightened sensitivity to sounds. Sensory processing differences are part of what make the world disabling for autistic people, impacting family life, education and mental health. While members of the autism community are all too aware of the importance of sensory processing differences, people without autism-specific training or expertise may be unaware of the effects that sensory processing differences have on daily life. In this project, we will be working with autistic people to create an immersive experience to inform those who come into day-to-day contact with autistic people (e.g., hairdressers, shopkeepers) about sensory processing differences. Shops, hairdressing salons and leisure places will be transformed into sensory experiences based on descriptions of difficulties faced by autistic individuals. To do this, we will first work with autistic individuals to hear which aspects of different environments most affect them and which audiences they would most like to be informed about their sensory needs.

PI: Dr Jacinta O'Shea (Psychiatry, Oxford)
Project team: Dr Carinne Piekema, Dr Maria Larriva-Hormigos, Dr Polly Waite, Dr Maryann Noonan (Oxford), Katrina O'Malley (Cooper School)
"Building stress resilience in early adolescence" – co-creation with young people
£72,256.84

Stress related disorders, anxiety and depression, affect over 615 million people worldwide. They impose huge personal, health and socioeconomic costs. For most people the problem develops before their early twenties. The longer a person has a mental health problem, the

harder it is to treat. Therefore, intervening earlier in life, to promote stress resilience, is a promising preventative strategy to reduce the burden of mental ill health. Early adolescence is a critical period of brain development in which circuits that control cognitive and emotional functions mature. We aim to engage young teenagers and equip them with the knowledge and practical skills to drive their own brain development in a positive direction that promotes good mental health. The central scientific insight we wish to share is that stress is a biological state with positive benefits, but which undermines mental and physical health when it becomes chronic. We aim to inform, inspire and empower teenagers to cultivate stress resilience skills and thus enable them to better manage their own minds. To achieve this goal, we will partner with students and teachers across schools in Oxfordshire to co-create a 2-year program of stress resilience skills development, to be delivered in schools to Years 7-9. Students will be partners and co-creators throughout each step of the process, from conception to evaluation. We will co-create a reusable shareable toolkit of practical and digital content and embed it in the curriculum.

PI: Prof. Martin Maiden (Zoology, Oxford)
Project team: project leads Dr Charlene MC Rodrigues & Dr Frances Colles (Oxford), various other researchers and public engagement professionals (Oxford)
"Genome Detectives" – citizen science and animation project
£49,115.88

'We are drowning in information but starved for knowledge' (John Naisbitt, Megatrends, 1988) is a statement that is currently very relevant to public health microbiology, the science that tries to keep people safe from infectious diseases. A particular problem is the enormous amounts of information generated by reading the DNA of disease-causing microbes. Clever computer programs can help with this, but people are much better. This project enables interested members of the public help us to understand epidemics, pandemics, and the microbes that cause them. Using the citizen science platform 'Zooniverse' (https://www.zooniverse.org/), state-of-the art animations will show participants how to examine the genetic makeup of disease-causing bugs. Then, using special on-line tools, they will analyse the data. The results will be fed through to scientists who will assimilate their information into knowledge that will be incorporated into the website. The goal is a two way-dialogue to build and disseminate understanding while simultaneously generating engagement with research.

PI: Prof. Anne Goriely (Weatherall Institute of Molecular Medicine, Oxford)
Project team: Dr Nina Hallowell, Dr Hana Mlcochova, Arianna Manzini (Oxford)
"Me and my genome: What am I really made of?" – critical thinking and young people
£32,000

There is an ever-growing enthusiasm and fascination for 'recreational genetics' (home-testing kits) to query our own ancestral history, identify genetic relatives, discover personalised health-related susceptibilities, or even create tailored diets, with likely impacts on medical treatments, society and our own sense of identity. This project aims to develop a comprehensive educational package for young people (16-18yrs old) to promote

understanding and critical thinking on the promises and potential pitfalls of this so-called 'genomic revolution'. As a team composed of genetics researchers and bioethicists, we will address key scientific and ethical aspects of genomics that derive from our own research. In 'Me and My genome' we will explore some of the ways genetic differences between people arise. We will develop online engagement materials and run workshops that are designed to explore the processes by which new mutations (which can sometimes cause disease or differences between people) arise during the production of sperm and how these are passed down through generations. We will demonstrate how these genomic variations complicate the interpretation of the information contained in our genomes and the predictive power of genome analysis.

PI: Dr Carlo Rinaldi (Paediatrics, Oxford)
Project team: Dr Mitra Forouhan (Oxford), Athanase Kollias (K-Invent)
"Muscle Switch" – interactive
£15,000

Incorporating video-gaming and hands-on craft workshops, 'Muscle Switch' aims to inform the audience about the mechanisms of transcriptional regulation of muscle mass in health and disease, while triggering a debate over the role of muscle in whole-body wellbeing, what makes us strong, and what is considered 'normal strength', based on multiple factors such as age and sex. In the video-game the participant will have to collect proteins floating in the cytoplasm of a muscle cell and bring those into the nucleus and then on the DNA. Once this task is completed and the transcriptional complex fully assembled, a short animation about muscle will seal victory. In order to control the character the player will need to apply maximum hand grip force through a specialised joystick, which is a hand-held dynamometer equipped with electronic force transducers. By capitalising on the UK network of local science festivals, with our engagement programme we aim to encourage children and young adults to think about what living with muscle wasting diseases is like.

PI: Prof. Jane Mckeating (Nuffield Department of Medicine, Oxford)
Project team: project lead Alison Stibbe (Oxford); research fellows and DPhil students (Oxford); Lois Muddiman (artist); Rosehill Primary School
"Understanding viruses: combining science and art to empower young people" – exhibition and workshops
£10,000

The project will forge a partnership between virologists at Reuben College, an artist and a local primary school with the goal of educating young children about viruses. The scientists will create materials to introduce and explain the microbial world to young children, particularly what viruses look like, how they replicate and are transmitted. Our workshops will build a sense of empowerment by engaging with this unseen world in the active creation of art – paintings or models – that will be exhibited and celebrated at the College.

PI: Dr Anna Mitchell (Experimental Psychology, Oxford)
Project team: Dr Brook Perry, Dr Juan Carlos Mendez, Eleonora Lomi, Stuart Mason (Oxford)
"APE: Animations and Public Engagement to promote transparency in primate neuroscience research" – animations, schools and festivals engagement
£10,000

This project will conceptualise for the public using video, animations, hands-on workshops and talks why and how we use animal models and humans to investigate the brain circuitry involved in learning new information, making memories, and making value-based decisions. We'll describe the methods and techniques we used and explain some of our latest findings and the projects we are working on to study the normal brain and what happens when we can no longer learn or remember so well.

Enriching Engagement awardees: Round 1 (awarded November 2019)

PI: Prof. Chris Lintott (Physics, Oxford)
Project team: project lead Dr Helen Spiers
"Scribbling for Science in Schools: Taking Authentic Research into Schools with the Zooniverse" – citizen science workshops
£63,743.00

This project adapts the online citizen science format of the Zooniverse platform into a workshop that can be brought into schools. The project team are applying their experience of developing successful educational workshops for primary school pupils to the 'Science Scribbler' suite of projects. The research focus of the workshops, based on the research of the main Wellcome grant it is associated with, is understanding the biological basis of Huntingdon's Disease and advancing knowledge of virus replication. The project is producing three novel, hour-long workshops that are focused on creating even more enriching experience for the citizen science volunteers.

PI: Prof. Patricia Kingori (Ethox Centre, Oxford)
Project team: Eloise King (filmmaker)
"The Shadow Scholars of Global Health" – documentary
£52,450.65

This documentary project aims to stimulate public engagement on the subject of fakes, fabrications and falsehoods in global health. It focuses on the people and processes involved in 'shadow scholarship' - people being paid to produce academic work in the name of others. The documentary provides an accessible means in which 'shadow scholars' can co-produce their own accounts of the nature of the academic writing for hire industry and is the first documentary to explore this issue. It raises important questions related to the growth of 'shadow scholars' and what the impact of these activities is for the value,

relevance and benefits of education, and about current strategies to build or strengthen capacity in STEM in the Global South. This Enriching Engagement project will enable the PI to engage with the shadow scholars, rather than as part of the 'formal' research process, which has the potential to open up conversations and enrich and enhance their research.

PI: Prof. Shankar Srinivas (Department of Physiology, Anatomy & Genetics, Oxford)
Project team: project lead Dr Tomoko Watanabe (Oxford), Anan Atoyama (choreographer)
"Dynamic Origins" – dance project
£29,560.00

This project brings together a dance choreographer with researchers that are focusing on embryonic cell movement. A major aspect of the researchers' work relies on using microscopes to image cell movements in the embryo and computer programs to visualise these data, so that they can understand how they lead to the emergence of form; however, even with these modern tools, they have difficulty sometimes truly assimilating the complicated three-dimensional changes occurring over time during development. AToU is a dance company with a strong emphasis on creating dance pieces to visualise invisible and unknown aspects of humans and society. This Enriching Engagement funded project brings researchers and AToU artists together to visualise and experiences processes that are not easily seen, through the medium of dance. Plans to share the project's outcomes more widely are currently being redeveloped in light of Covid-19.

PI: Prof. Derrick Crook (Nuffield Department of Medicine, Oxford)
Project team: project lead Dr Philip Fowler and PER Coordinator Carla Wright (Oxford)
"Broadening and deepening public participation in BashTheBug.net" – online citizen science project
£20,429.00

This project aims to improve how BashTheBug engages with both the wider public and their existing base of citizen scientists. Its secondary aim is to develop legacy planning for BashTheBug to ensure its longevity past the end of its parent research project, CRyPTIC. BashTheBug engages citizen scientists to classify image data relating to tuberculosis and its resistance to antibiotics. It is hosted by the online citizen science platform Zooniverse. The project recently reached the milestone of 4 million image classifications completed by its volunteers, and, as an entirely online project, is seeing very high engagement numbers during the Covid-19 lockdown. The Enriching Engagement scheme enabled the team to recruit a p/t PER Officer to focus on significantly improving the reach and diversity of the citizen science volunteers and effectiveness of this Citizen Science platform.

PI: Dr Alex Bullock (Structural Genomics Consortium, Oxford)
Project team: project lead Dr Ellie Williams (Oxford)
"Development of an SGC Zone within SMASHFest UK: Space Plague " – escape room
£10,000

This project developed an escape room focused on the problems and solutions to drug development and the use of open access research. It was successfully trialled in February 2020 at SMASHfestUK: Space Plague. SMASHfestUK was an immersive experience with a diverse mash-up of Science, Engineering, Technology, Maths & Arts - working for better gender, ethnic and socio-economic diversity in STEAM education and careers, and developing and publishing new design-led methods & approaches for creative public engagement, participation & impact. Through the story of an outbreak of a 'space plague', participants took on the role of scientists combatting the plague outbreak and learned about the real-life (and multidisciplinary) science behind it. Afterwards they had a chance to follow up on their experience and investigate the processes behind drug discovery in the escape room and at the same time learn about the work the Structural Genomics Consortium gets up to. The team is now developing an online version of the escape room in response to Covid-19. The Enriching Engagement scheme encouraged and enabled the team, funded by a Wellcome Strategic Award, to apply for PER funds for the first time.

PI: Prof. Deborah Gill (Radcliffe Department of Medicine – NDCLS, Oxford)
Project team: various (Oxford)
"Gene Therapy for lung diseases" – young people engagement
£5,000

This project team planned a series of hands-on activities suitable for a science stall or school workshop. The first of these were successfully trialled in spring 2020, and further school and festival plans are now being reassessed in light of Covid-19. These activities introduced basic concepts of genetic diseases in the lung and the use of DNA as a treatment. The driver for this was the discrepancy between how gene therapy works and public understanding of the topic. In previous engagement efforts, the project team had found that both young people and adults are generally surprised to find that there are UK patients currently receiving gene therapy, since film and TV drama tend to portray gene therapy as both fantastical and risky. The project aims to separate fact from fiction. The Enriching Engagement scheme enabled this team to both develop and test the activities and to build engagement capacity within the research team, including those in the early stages of their career.