Wellcome Trust Biomedical Vacation Scholarships Projects 2025

Biochemistry, Dr Minkoo Ahn: Understanding the co-translational translocation of membrane proteins

Protein folding within cells is highly complex, particularly for membrane proteins that undergo co-translational translocation during biosynthesis. Approximately one-third of the proteome consists of membrane-bound proteins, which are directed to cell membranes during translation through a coordinated mechanism involving the ribosome, the signal recognition particle (SRP), and the SecYEG translocon. While recent cryo-EM studies have revealed transiently folded membrane protein segments in the SecYEG translocon, detailed structural and dynamic insights into this process remain elusive. This project aims to investigate the co-translational translocation of an engineered membrane protein using solution NMR spectroscopy, a technique well-suited for studying protein dynamics. The model protein is efficiently produced in E. coli and its sequence can be computationally modified providing a flexible platform for exploring co-translational membrane protein folding and insertion dynamics. The central hypothesis is that the model protein will form transient helical structures at different stages of translocation, particularly within the SecYEG channel. This project will provide training in molecular biology, preparatory biochemistry for generating and purifying membrane proteins and SecYEG translocon. Additionally, it offers a unique opportunity to apply solution NMR spectroscopy to study membrane protein structure and dynamics within the complex molecular machinery of the cell. This research will contribute valuable insights into membrane protein biogenesis, enhancing our understanding of cellular protein folding and guiding the design of novel bioengineered membrane channels for therapeutic and industrial applications.

Biological Sciences, Dr Nathalie Stroeymeyt: Using spatial architecture to decrease epidemic risk: lessons from social insects

Human and animal societies function as complex systems, whose properties emerge from who individuals interact with, where, and when. Recent work has shown that social, spatial and temporal heterogeneities within groups shape fundamental collective processes, such as the spread of diseases. This raises the tantalising possibility that architecture could be harnessed to decrease epidemic risk. As biological systems have been shaped by millions of years of evolution, they have the potential to provide a valuable source of inspiration for designing buildings or urban layouts that slow down pathogen transmission. The aim of this summer project will be to use ant colonies as an experimental system to use manipulative experiments to investigate how ants modify the architecture of built above-ground nests when faced with an infectious pathogen, and test whether these changes contribute to increase their resilience to future disease challenges. The project will use a range of cutting-edge techniques for data recording (3D-surface scanning) and analysis (network analysis, computer vision). This project may uncover intervention architectural strategies that have been tuned by millions of years of evolution to balance epidemic mitigation against societal disruption and so pave the way

towards new bio-inspired principles for the design of efficient and resilient disease-free environments.

Biological Sciences, Dr Sinead English: Impacts of stress in pregnancy on mothers and offspring

Across many animals, it is known that experiencing stress in pregnancy leads to adverse outcomes for mothers and offspring, both immediately and in the long term. Many populations now face multiple stressors, including extreme weather events, infectious disease outbreaks and the double burden of nutrition (over- and under-nutrition). In our lab we study how these stressors affect outcomes for mothers and their offspring from an evolutionary perspective, using long-term studies on humans, comparative analyses, theoretical models or experiments on insects which get pregnant (tsetse flies or Pacific beetle-mimic cockroaches). For this summer project, the student could get involved in a component of this project that fits their interest and training needs best: for example, testing the effect of night-time temperatures on pregnancy outcomes in an insect model; or whether females who were themselves stressed in utero have higher stress resilience at adulthood. The intern will thus have hands-on experience in the lab of setting up insect experiments and being involved in husbandry, measurements and data organisation. If the project involves a more comparative or theoretical aspect, the project could be focused on extracting data from the published literature and using tools of meta-analysis to investigate broader trends.

Bristol Medical School, Dr Denize Atan: Ocular biomarkers of neurological disease

Ocular biomarkers of neurological disease: A study of retinal imaging and/or eye tracking abnormalities associated with neurological disease, including dementia, stroke, and brain tumours. This project could be tailored to clinical research and/or data analysis depending on the interests of the student.

Bristol Medical School, Dr Denize Atan: Improving the diagnosis of papilloedema in primary care

Improving the diagnosis of papilloedema in primary care: Applying digital technology and developing an evidence base to inform and educate primary care practitioners in the diagnosis of papilloedema. This project could be tailored to educational research or primary care research depending on the interests of the student.

Bristol Medical School, Dr Denize Atan: 'Hidden hunger' and visual health

'Hidden hunger' and visual health: 'Hidden hunger' occurs when vitamin and mineral intake and absorption are too low to sustain health while visible signs of undernutrition, e.g., low weight,

are absent. This project could be tailored to clinical research and/or data analysis, depending on the interests of the student.

Bristol Medical School, Dr Denize Atan: Environmental risk factors for myopia (short-sightedness)

Environmental risk factors for myopia: Spending time outside is one of the best ways to prevent myopia (short-sight) in children. This project will investigate why time outside is protective against myopia and can be tailored for clinical research and/or public engagement/participation research, depending on the interests of the student.

Bristol Medical School, Professor Ellen Brooks Pollock: A mixed methods evaluation of vaccine uptake data in England

Vaccination is one of the most effective public health interventions, preventing the spread of infectious diseases and reducing morbidity and mortality worldwide. A student-led project aims to collate and critically evaluate vaccine uptake data for England, providing insights into coverage rates, regional disparities, and demographic trends. The project involves gathering data from publicly available sources, such as the UK Health Security Agency (UKHSA), NHS England, and the Office for National Statistics (ONS). Students will analyze vaccine uptake across different age groups, ethnicities, and socioeconomic backgrounds, identifying patterns and potential barriers to immunization. A key focus is on routine childhood vaccinations, influenza, and COVID-19 vaccines, assessing how uptake has evolved over time. Critical evaluation will include comparing England's vaccine uptake with historical trends and international benchmarks, considering factors such as misinformation, accessibility, and policy changes. Students will also assess the effectiveness of government initiatives aimed at increasing vaccination rates, such as public awareness campaigns and school-based immunization programs. Findings from the project will be compiled into a report with recommendations for policymakers and healthcare providers. By highlighting disparities and suggesting targeted interventions, this initiative can contribute to improving vaccine coverage and public health outcomes. The project not only enhances students' research and analytical skills but also fosters a deeper understanding of the real-world challenges in public health. Ultimately, this study underscores the importance of data-driven approaches in addressing vaccine hesitancy and ensuring equitable access to immunization.

Bristol Medical School, Dr Christin Hoffmann: Mapping behaviours and their determinants to optimise sustainable practices in surgery.

Climate change is one of the biggest threats to human health. The NHS is a major contributor to the UK's carbon footprint, being responsible for about 4% of total emissions. Operating theatres are the most resource intensive departments in hospitals. The NHS has committed to reach net zero carbon emissions by 2045 and set out key actions to reduce emissions. In particular, reducing emissions in operating theatres in a policy priority. Key national and global

stakeholders prioritised research into how to scale carbon reduction interventions during and around the time of an operation, including how healthcare professionals can be encouraged to adopt sustainable actions in practice. There is currently limited understanding about the specific factors that influence uptake of behaviours that underpin sustainable practices in surgery. Understanding the detailed individual-level behaviours and the determinants that influence these behaviours is the first fundamental step to discovering which behaviour change interventions might optimise implementation the implementation of carbon reduction initiatives. Exploratory research is needed to identify the key target behaviours and determinants affecting the uptake of sustainable practices in surgery. This project will use scoping review methodology to synthesise peer-reviewed literature, policy documents and healthcare sustainability reports to map target behaviours and their determinants in relation to sustainable practices during and around delivering an operation.

Bristol Medical School, Dr Laura Tinner: Exploring mental health impacts of violence and harassment in public neighbourhood spaces using qualitative and mixed methods

This internship is an opportunity for someone interested in mental health from a public health perspective using mixed methods. The intern will be part of a team of mental health researchers at Bristol Medical School, gaining experience in different qualitative and mixed methods as well as public engagement work. There is a core project that the intern will be working on over the 6 weeks, with the opportunity to spend some time with different members of the team. The internship has been designed in this way to offer breadth of experience but also a concrete output based on a central project. The discreet project, which is part of PhD work, explores the mental health impacts of violence and harassment exposure in public neighbourhood spaces. Methods include photovoice, app-generated emotion tracking and go-along interviews, with the aim of developing a novel emotion-mapping app. The intern will contribute to data collection and qualitative analysis of interview data. They also can develop their own smaller sub-analysis using this data, aligning the research focus with their own interests and exercising autonomy over its direction. This will involve an exploration of the relationship between resident emotions in public neighbourhood spaces and specific neighbourhood features using a combination of study data (especially app-generated study data) and publicly available spatial datasets from Open Data Bristol (including features such as streetlights, crime reports, transport data, and neighbourhood amenities). We will set the internship objectives together at the start of the work, working towards an output (e.g., a report, blog, poster).

Bristol Medical School, Dr Monika Halicka: Effects of psychosocial and pharmacological interventions on the severity of cannabis use disorder - systematic review and meta-analysis

Cannabis use disorder (CUD) is characterised by habitual use, craving, and inability to stop consuming cannabis despite it causing physical or psychological harm. With increasing incidence and prevalence of CUD globally, more people are seeking treatment. Some psychosocial and pharmacological interventions have been shown to be promising. However, there is considerable variability in how their effectiveness is measured in clinical trials, and lack

of consensus on what represents a meaningful therapeutic change. This poses a challenge for comparing or pooling results across trials to identify the most effective treatments. Abstinence from cannabis tends to be the most commonly used indicator of intervention effectiveness. However, a clinical benefit could also be conceptualized as reduced symptoms, severity, or remission of CUD. We have recently completed two systematic reviews of the effectiveness of pharmacological and psychosocial interventions for CUD (NIHR167862; NIHR165373), which did not include CUD symptoms among the outcomes of interest. The proposed evidence synthesis project would address this gap in the evidence by evaluating the effectiveness of different pharmacological and psychosocial interventions in terms of reducing the number and severity of symptoms and remission of CUD. The intern will identify relevant trials published since the original database searches and also screen the studies included in our reviews for reporting of CUD symptom-related outcomes, extract the relevant results, assess their risk of bias, and synthesise the results using meta-analysis if sufficient data is available. The intern will also assess the certainty of the combined evidence.

Bristol Medical School, Dr Sangeetha Paramasivan: Inclusivity in clinical trials and health inequities

Ethnic minority groups have a high disease burden yet are under-represented in clinical trials. This includes trials of conditions that disproportionally affect them (e.g., diabetes), meaning the results of these trials are less likely to apply to them. This can perpetuate and widen existing health inequities. We are working towards addressing this in the QuinteT team. The intern will have the opportunity to be a part of our team for the 6-week duration, undertake desk-based and field research and write brief research reports. They will be able to contribute to qualitative data analysis in the team, ongoing reviews, and help with the organisation of workshops with Industry and community partners for a small-scale new project. Within the scope of the work undertaken in our team, we will choose projects that best align with the intern's interests in discussion with them at the start of the internship. Their contributions will be acknowledged with agreed co-authorship on resulting publications. We will buddy them with the PhD student and the NIHR pre-doctoral fellow in our team. Our aim is to provide the intern a taste of academic research (that has an applied/practical impact), corresponding skills and teamworking. This in turn will, we hope, contribute towards furthering their research interests in the longer term.

Bristol Medical School, Simona Kent-Saisch and Abi Howard: The PASSPORT Study - Developing content for a school-based physical activity intervention

Background: The PASSPORT study is taking a context-specific approach to developing a school-based physical activity intervention. School context includes the setting, facilities, culture, existing physical activity provision, expertise and interests of staff, and the pupil demographic. Traditional intervention approaches have had limited success in increasing children's physical activity, and we think this is partly because they ignore school context. PASSPORT is working with primary schools to co-design a tool that will be used to assess a schools' existing physical

activity context and identify opportunities to build on. To complement this, we are developing a portfolio of physical activity interventions that schools can select from. Schools will be recommended a selection of these in a report. Schools will then be provided with an action plan to implement the selected interventions.

Aim: To develop the intervention content within the school portfolio.

Project outcomes: The student will contribute to the design and development of the content of the portfolio intervention. There may be also be opportunities to assist in the development of bespoke content e.g. video briefings. The student will gain experience working on a pilot study in addition to having opportunity to engage with broader activities in the Centre for Public Health.

Bristol Medical School and School of Psychological Science, Dr Hannah Sallis and Dr Robyn Wootton: Making exercise more effective (MEME) - Using wearable devices to measure exercise during exercise interventions for depression and anxiety

Exercise is repeatedly shown to improve symptoms of depression and anxiety. Therefore, prescribing exercise could be an effective alternative (or adjunct) to treatment for the growing number of individuals presenting to university mental health services. However, there is currently no evidence-based framework to tailor the exercise intervention appropriately to individual needs. We need to better understand the mechanisms that make exercise beneficial for mental health. We are currently running a feasibility study piloting the use of wearable technology and collection of regular mood data via a smartphone app within an exercise intervention (Healthy Minds) at the University of Bristol. This will allow us to capture fine-grained measures of exercise and mood, with the long term aim of investigating how exercise and mood interact in real time, and identifying the most important components of exercise so interventions can be tailored appropriately. The student will be responsible for data collection as part of the feasibility study, attending project meetings and liaising with the Healthy Minds team where necessary. They will also have the opportunity to perform data analysis of existing datasets from a linked feasibility study and contribute to drafting the manuscript for publication. The student should have familiarity with running basic scripts in R.

Bristol Medical School, Professor Jason Johnson: Elucidating similarities in microRNA expression between vein graft failure and subclinical atherosclerosis

The development of subclinical atherosclerosis involves aberrant growth of vascular smooth muscle cells followed by an inflammatory infiltrate. A similar process occurs during the failure of vein grafts. Collectively, both diseases underlie the majority of cardiovascular deaths. The intern will be utilising existing next generation sequencing transcriptomics data from human atherosclerotic coronary artery samples alongside those obtained from a porcine vein graft model. The project will involve applying machine learning and bioinformatic tools to differing data sets to identify distinct microRNAs which overlap between two cardiovascular diseases – atherosclerosis and vein graft failure. Accordingly, identification of differentially expressed

microRNAs between the two diseases has the potential to identify novel therapeutic targets. The mechanism of microRNAs involves their inhibition of mRNA to protein translation for specific mRNA targets. Consequently, a second aim of this project is to deploy machine learning prediction tools to determine common mRNA targets for shared microRNAs. Subsequently, the protein expression of identified mRNAs will be explored in human coronary atherosclerotic plaque sections and porcine vein grafts samples through immunohistochemistry. The intern will then utilise image analysis of digital pathological images to quantify protein expression alongside vascular smooth muscle cells markers to explore potential similarities between subclinical atherosclerosis and vein graft disease.

Cellular and Molecular Medicine, Dr Kate Burley: Bridging the Gap in Bleeding Disorder Diagnosis: A Big Data Approach to Symptom Quantification

Haematologists frequently assess patients for potential bleeding disorders; however, confirming a diagnosis in this population can be challenging due to the variability of symptoms and their overlap with other medical conditions. Studies of patients referred based on a personal or family history of bleeding have shown that only 30% ultimately receive a diagnosis of a defined bleeding disorder, such as von Willebrand disease or a platelet function defect. This highlights the existence of numerous bleeding tendencies that remain unclassified. To advance our understanding of the genetic architecture of bleeding, it is essential to assess bleeding symptoms across large populations. Current methodologies for analysing electronic health records primarily focus on hospital admissions, for example for acute intracranial haemorrhage, often overlooking the subtler aspects of bleeding, such as easy bruising, that may not require specialist intervention. This summer student project aims to develop and pilot a bleeding assessment tool that integrates data from both general practice and hospital records, facilitating the quantification of bleeding symptoms across large-scale cohorts such as the UK Biobank. The student will work on designing algorithms to extract and categorise bleeding-related symptoms from electronic health records. They will gain hands-on experience with big data analysis, coding (e.g. Python, R), and statistical modelling. Additionally, the student will have the opportunity to observe haemostasis clinics, gaining clinical insights into the challenges of diagnosing and managing bleeding disorders. This interdisciplinary project will provide valuable exposure to biomedical research, computational methods, and translational applications in haematology.

Physiology, Pharmacology and Neuroscience, Dr Stanley Buffonge: Investigating the Mechanism by Which Finerenone Improves Cardiac Microvascular Function in Inflammatory Diseases

The endothelial glycocalyx, a protective layer lining vascular endothelial cells, plays a crucial role in regulating microvascular permeability. Our research has shown that clinically licensed mineralocorticoid receptor antagonists, such as Finerenone, have the potential to protect the endothelial glycocalyx in diabetes. However, the precise mechanism of action remains unclear. This project aims to investigate the mechanisms through which Finerenone preserves the

endothelial glycocalyx, with a particular focus on key enzymes involved in glycocalyx shedding, including MMP9. The student will gain hands-on experience with in vitro techniques such as tissue culture, ELISA, immunofluorescence, and Western blotting. Additionally, there may be opportunities to analyse echocardiography data from animal studies. This project offers valuable training in cardiovascular research and endothelial cell biology, providing insights into potential therapeutic strategies for improving microvascular function in inflammatory diseases like diabetes.

Physiology, Pharmacology and Neuroscience, Dr Tamara Boto: Effects of traumatic brain injury in Drosophila sleep

Traumatic brain injury (TBI) is a leading cause of deterioration of health and wellbeing leading to long-lasting changes in brain function. TBI is difficult to treat because the specific mechanisms of disease progression are not understood. These mechanisms include chronic neuroinflammation and neural damage, leading to persistent cognitive symptoms. Drosophila offers powerful genetic approaches to study pathological processes at different timescales, providing cellular resolution while preserving intact nervous and immune systems. The Boto lab has adapted a paradigm to induce repetitive mild trauma that allows both precision at the site of impact and programable intensity in the fruit fly. The proposed project will consist in the calibration of the TBI apparatus and analysis of the effects of the administered trauma in sleep: we have previously reported that TBI in Drosophila induces neuroinflammation and sleep-wake disturbances (SWDs) in flies, recapitulating symptoms observed in human patients. The student working in this project will be closely mentored by the principal investigator and collaborate with other lab members, acquiring experience working in a dynamic research environment, using Drosophila genetics and acquiring automatised behaviour data. This will set up the fundamental groundwork for future studies on how acquire trauma leads to the deterioration of brain function.

Physiology, Pharmacology and Neuroscience, Professor Hugh Piggins: Circadian Rhythms and Nicotine Addiction

Nicotine is a highly addictive substance whose consumption through the chewing and smoking of tobacco products (including vapes) poses significant risk to individual and population health (1). Nicotine exerts is actions via nicotinic receptors in the brain of which a key structure is the habenula (2) which communicates with midbrain reward centres. The habenula (Hb) also rhythmically expresses circadian clock genes and shows daily changes in its neuronal activity (3). This raises the possibility that nicotine's actions on the Hb are time of day dependent. Here, the student will investigate if and how the actions of nicotinic compounds on mouse Hb neurons varies across the 24h cycle. They will learn to make Hb brain slices and to use a multielectrode array system to record spontaneous Hb neuronal activity at different times of the 24h cycle and determine if neuronal sensitivity to nicotine changes from day to night. The student will also learn to use fluorescent in situ hybridisation to visualise nicotinic receptor subunit expression in the Hb. This will enable determination of whether nicotinic receptors are

increased or decreased in expression at different times of the day and illuminate optimal times of the day for anti-smoking medications. (1) Bilano, V., Gilmour, S., Moffiet, T., et al. (2015) The Lancet 385: 966-976. DOI: 10.1016/S0140-6736(15)60264-1 (2) Kim, K. and Picciotto, M.R. (2023) Curr. Opin. Neurobiol. 83:102797. DOI: 10.1016/j.conb.2023.102797. (3) Bano-Otalora, B. and Piggins, H.D. (2017). Pharm. Biochem. Behav. 162:46-54. DOI: 10.1016/j.pbb.2017.06.007.

Physiology, Pharmacology and Neuroscience, Professor James Hodge: In vivo characterisation of novel Alzheimers risk genes and mutations using flies

Genome sequencing of people with Alzheimer's disease (AD) have identified several genes and mutations associated with AD(Bellenguez et al., 2022). We use the genetic tractability and short lived, fruit fly, Drosophila to characterise the role of these novel AD genes. We have obtained transgenic mutant lines for the closest Drosophila genes equivalent to these human genes which will then be screened for AD-like effects in the fly. Firstly, mutants will be expressed in all neurons (using elav-GAL4) or all glia (using repo-GAL4) and the effect on lifespan will be measured. They will be expressed in the eye (using GMR-GAL4) to assess degeneration, all assays set up in the lab (Buhl et al., 2022). Secondarily, changes in memory will be assessed with the olfactory-shock conditioning assay by expressing the mutants in the fly's memory neurons, the mushroom body (with OK107-Gal4). Thirdly, the effect of the AD risk gene mutations on circadian rhythms and sleep will be assessed by expressing the candidates in all clock neuron (with Tim-Gal4) or pan-neuronally respectively again using assays routinely used in the lab to model AD(Buhl et al., 2019). Mechanistic insight will be provided by measuring neurodegeneration, neuronal excitability and whether the mutants make better or worse the effect of expressing human Tau and amyloid-? in the fly, the therapeutic potential of these novel AD models will be measured using pharmacology to reversal disease phenotypes(Higham et al., 2019a; Higham et al., 2019b; Lowe et al., 2019; Zhu et al., 2022b; Zhu et al., 2022a).

Physiology, Pharmacology and Neuroscience, Dr Paul Banks: Fluorescent labelling of brain cells involved in memory using virally encoded activity markers

Novel molecular-genetic tools permit fluorescent labelling of brain cells which have been strongly activated during a distinct time window. These technologies have been used to identify cells that encode multiple forms of memories. These genetic tools have now been packaged into viral vectors which can be delivered into brain tissues and will permit activity dependent labelling in animal models of disease or in animals which we can label specific cellular populations. In this studentship you will perform histological analysis to examine fluorescent labelling patterns in mouse brain tissue which has been treated with activity-dependent viral labelling tools. The project will be primarily computer based, using microscopy analysis software to optimise images and count cells within sections, and to quantify and organise data for presentation. There will also be scope for the student to perform image collection using fluorescence microscopy and ample time will be permitted to allow the student to observe lab

activities such as in vitro slice electrophysiology using whole-cell patch clamp and immunohistochemical staining.

Psychological Science, Dr Edwin Dalmaijer: How do food preferences and dislike impact stomach physiology?

The stomach influences our behaviour: its activity is modulated during periods of disgust, and when it is settled pharmacologically our disgust-avoidance behaviour is reduced. In this project, we aim to specifically look at disgust for unfamiliar foods in young children. Stomach physiology will be measured using electrogastrography, and we will teach you how to use this technique and how to analyse the generated data. Applicants should have an affinity with human physiology, children, and data. Programming skills are a plus, but not required.

Psychological Science, Professor Jeff Brunstrom: Does the micronutrient content of fruit combinations predict their palatability and consumption?

Non-human animals appear to select diets that can resolve micronutrient deficiencies. In our recent paper, we questioned whether this 'nutritional intelligence' extends to humans (1). Using an online food choice task, we found a greater preference for pairs of fruits and vegetables that offer a broad range of micronutrients (termed micronutrient complementarity). Furthermore, in real-world meals, we found a tendency to avoid food combinations that provide an excess of single micronutrients. Building on the above, this project aims to assess whether micronutrient complementarity in fruit combinations predicts choice, liking, and ideal portion-size selection. Moreover, this research seeks to translate the findings from an online hypothetical food-choice task to laboratory-based food consumption. These findings will ultimately contribute to understanding whether and how humans select micronutrients within their diet. In this project, the student will be based in the Nutrition and Behaviour Unitand will play a key role in data collection. Their role will involve participant recruitment, preparing food stimuli, and engaging with participants throughout the study. The student will also assiste with pre-registration and will have an opportunity to learn basic programming in Pavlovia (PsychoPy). After data collection, the student will also provide assistance with data wrangling and analysis. (Brunstrom, J. M., & Schatzker, M. (2022). Micronutrients and food choice: A case of 'nutritional wisdom' in humans? Appetite, 174, 10605).

Psychological Science, Dr Karla Holmboe: Longitudinal Executive and Attentional Functions (LEAF) Study

At the Bristol University Baby Lab (BUBL), we are running a large-scale longitudinal study investigating the earliest development of executive functions across infancy and toddlerhood. Executive functions (EFs) are a set of cognitive abilities that allow us to guide our behaviour and make adaptive decisions in everyday life, and they provide us with the ability to control our thoughts and actions, solve problems, and multi-task. EFs are particularly challenged in young children, and little is known about EFs before the age of 3. During the internship, you will be

given the opportunity and training to develop skills in collecting experimental data from infants and toddlers using both behavioural and eye-tracking measures and neuroimaging techniques, such as electroencephalography (EEG) and functional near-infrared spectroscopy (fNIRS). You will also be responsible for the systematic and timely back-up of data collected across this study and will develop strong record-keeping and data management skills. This project is an ideal opportunity for a student considering a career in research. It would also suit students who are looking to develop knowledge and skills transferable to a clinical career. You will be a fully involved member of the research team, alongside Dr Holmboe and her team. Dr Holmboe has extensive experience supervising research placements and previous placement students have secured research-focused or other competitive public sector jobs after graduation or have gained entry to competitive postgraduate degrees.

Psychological Science, Dr Kristopher Magee: Human Olfaction as a Therapeutic Tool Through the Modulation of Internal and External Cognition

While the effects of scent on mood, well-being, and cognition are well acknowledged, the mechanisms underlying these effects remain under-researched. A clearer understanding of these mechanisms would better inform how the olfactory system can be utilised in more targeted therapeutic applications to support mental well-being. One hypothesis is that scent may influence the balance between internally and externally directed cognition. This project aims to investigate whether olfactory stimuli affect the tendency to focus outward versus inward during a task designed to measure momentary internal and external awareness. We define external awareness as cognition directed toward the external environment via sensory input (i.e., outside the head or body), and internal awareness as cognition directed inward, involving processes such as daydreaming, inner speech, mental imagery, and memory. Internal awareness, often decoupled from the immediate environment, has been linked to reduced well-being and increased mind-wandering (Killingsworth & Gilbert, 2010). Depressive symptoms have also been found to correlate with greater time spent in internally oriented thought (e.g., Rostami et al., 2021). We propose that scent, as an external sensory cue, may help reduce internal focus and promote external awareness, thereby enhancing well-being. While the mood-enhancing effects of fragrance have been experimentally demonstrated (e.g., Herz, 2002), it remains unclear whether these effects are direct or mediated by a shift in attentional orientation. One aim of this project is to explore whether mood improvements from scent are linked to its ability to direct cognition externally. This role will offer the opportunity to be involved in the full research process, including reviewing the study design, participant recruitment, preparing and managing fragrance materials, as well as collecting and organising data, and contributing overall to a novel line of research.