King's College LONDON

IoPPN Research
Festival 2022

Translational Research:
From Discovery to Impact

Online event
14.00 – 17.30 Wednesday 11 May 2022

#IoPPNfestival

Welcome

We are pleased to welcome you to the 2022 IoPPN Research Festival, our annual showcase of exciting and innovative research from across the entirety of the Institute of Psychiatry, Psychology & Neuroscience.

While we hope to return to an in-person event in the coming years, we continue to be online for this year. Throughout the festival you will be learning about the valuable work and research being carried out by staff and researchers at a range of career levels. We will also be celebrating our 3-minute thesis finalists and the two inaugural winners of our Open Research Awards, emphasising our commitment to our students and the promotion of open science practices.

One of the highlights of the Research Festival has always been the chance to see the work going on in other departments and schools and make connections. And while we sadly won't be able to able to mingle and network with speakers and attendees over a coffee break or reception, we hope you will still take this event as an occasion to inspire collaboration.

This year we are also pleased to welcome our two keynote speakers:
Professor Louise Howard and **Professor Peter Goadsby**.

We would like to thank Annicka Ancliff, June Brown, Darren Williams, Marija-Magdalena Petrinovic, Hannah Warren, Trevor Brooks, Amelia Remmington and Robin Maginn; and all members of the RIC, and Press & Communications Department, who offered their guidance and support in the organisation of this year's festival.

We hope you will all enjoy the afternoon.

Professor Sir Simon Wessely
Interim Executive Dean of the
Institute of Psychiatry, Psychology
& Neuroscience

Professor Mitul Mehta
Chair of the Research
& Innovation Committee

Dr Paolo Deluca
RIC Lead for IoPPN Research
Festival

About this year's festival

This year's festival focuses on Translational Research: From Discovery to Impact.

It is an opportunity to showcase the innovative and ground-breaking research carried out at the Institute of Psychiatry, Psychology & Neuroscience, to highlight the process of turning discovery in the lab, clinic and community into interventions that improve the health of individuals and the public. A process that is not linear and unidirectional, and can start at different stages on the translation path, whether it is fundamental research, or translation to humans, patients, practice, and community.

This year's talks will try to capture this wide spectrum of translational research, and will span from neural stem cells research, to anti-inflammatories in depression, electronic alcohol interventions, and male eating disorders, to name a few topics.

Spotlight on: The Open Research Awards

The novelty and impact of our research is never far from our minds. But it's important to remember that high-quality research also needs openess.

The Open Research Awards were introduced in 2021 to reward and acknowledge staff and students who engage in open research practices to make their work as robust, accessible, transparent, reliable, replicable, and reproducible as possible. Researchers who engage in open research contribute to a much-needed shift in research culture, helping to keep the IoPPN at the forefront of world-leading psychiatry, psychology, and neuroscience research.

The 2021 winners were **Dr Ewan Carr** and **Dr Emily Hird**, and we are pleased to have both to present in this year's IoPPN Research Festival.

You can find out more about the Open Research Awards here:

🌐 **https://bit.ly/3kfiKv8**

Early Career Research Awards
2021–22

Autumn round

Early Career Research Awards Institute of Psychiatry, Psychology & Neuroscience

Dr Amit Benbenishty
Department of Developmental Neurobiology

Dr Raquel Oliveira
Wolfson Centre for Age Related Diseases

Early Career Research Awards NIHR Maudsley Biomedical Research Centre

Dr Charlotte Pretzsch
Department of Forensic & Neurodevelopmental Sciences

Dr Dominic Oliver
Department of Psychosis Studies

Spring round

Early Career Research Awards Institute of Psychiatry, Psychology & Neuroscience

Dr Ana Dorrego-Rivas
Centre for Developmental Neurobiology

Dr Silvia Oggero
Wolfson Centre for Age Related Diseases

Early Career Research Awards NIHR Maudsley Biomedical Research Centre

Dr Landon Kuester
Department of Addictions

Dr Tao Wang
Department of Biostatics & Health Informatics

Event programme

14.00	**Welcome** Professor Mitul Mehta, Professor Sir Simon Wessely, Professor Shitij Kapur, Dr Paolo Deluca	
14.15	**Keynote** Professor Louise Howard	Breaking the bias to impact on mental health
14.35	Dr Tim Powell	Lithium, the elixir of youth?
14.40	Dr Latha Velayudhan	Cannabidiol for neurodegenerative disorders
14:45	Dr Valeria Parlatini	The Maudsley CYPHER cohort study: understanding the impact of the Covid-19 pandemic on the mental health of children and young people with pre-existing mental health conditions
14:50	Professor Ted Barker	XCEPT research project
14.55	Dr Maria Antonietta Nettis	Research on anti-inflammatories medications in Major Depressive Disorder
15.00	**3-Minute Thesis finalist** Alex Martin	The role of the father in reducing risk of depression within families
15.05	Dr Zina Ibrahim	Predicting clinical outcomes from electronic health records data – challenges, status and outlook
15.10	Dr Charlotte Russell	Understanding and ameliorating age-related memory changes
15.15	Dr Phil Holland	New horizons in migraine therapy
15.20	Dr Una Foye	Consider male eating disorders: a creative approach to improving treatment in primary health care for men and boys with eating disorders
15.25	Dr Ahmad Al Khleifat	The identification of the clinical stage at which treatment is most effective in ALS
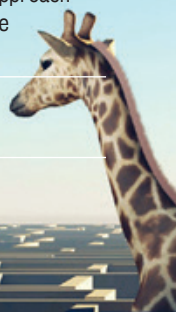
15.30	**Open Research Awards** Dr Ewan Carr	We need systemic solutions for open science
15.35	**Coffee break** (15 minutes)	
15.50	**Keynote** Professor Peter Goadsby	Cluster headache – translating science to the bedside
16.10	Elka Giemza	What is the Clinical Research Facility?
16.15	Dr Nicolaas Puts	Sensory differences in Autism
16.20	Dr Rita Sousa-Nunes	Cellular quiescence uncouples the proteome from the transcriptome
16.25	Dr David Andersson	Passive transfer of fibromyalgia from patients to mice
16.30	**3-Minute Thesis finalist** Alexandra Hertz	Aggression and reward in autism spectrum disorder
16.35	Professor Cathryn Lewis	Polygenic scores in mental health: prospects and pitfalls
16.40	Dr Paolo Deluca	From ELIZA to PAHOLA, electronic interventions for harmful alcohol use
16.45	Dr Sandra Vieira	Multimodal normative modelling in early psychosis
16.50	**Open Research Awards** Dr Emily Hird	Open research: why do it?
16.55	Dr Ryan Patel	The impact of descending pain modulation on spinal amplification mechanisms – from the rat dorsal horn to human psychophysics
17:00	Dr Peter Hawkins	Neuroimaging in clinical trials
17:05	**Closing remarks** Professor Matthew Hotopf	

Professor Louise Howard: keynote speaker

Professor in Women's Mental Health
Department of Health Service & Population Research

8 Breaking the bias to impact on mental health

Synopsis

Differences in the epidemiology of mental disorders in men and women are well-established. Despite this, it could be argued that until recently mental health research largely ignored sex (and gender) differences, risking undermining of scientific validity and efficiency, and potentially contributing to a failure of health providers to deliver gender-sensitive mental health treatments and services, to the detriment of both men and women. The IoPPN research group *Section of Women's Mental Health* have therefore focused on gendered determinants of mental disorders (and other structural determinants) and investigated gender sensitive interventions particularly perinatal mental health treatments and services. In this keynote talk, Professor Howard will discuss some of the group's recent findings and their impact.

Biography

Louise Howard is Professor of Women's Mental Health at King's College London, an NIHR Senior Investigator (previously an NIHR Research Professor) and an honorary consultant perinatal psychiatrist at South London and Maudsley NHS Foundation Trust. Her research focuses on women's mental health and gendered determinants of mental health and she has led several national research programmes on perinatal mental health, and the impact of domestic abuse and other forms of violence on mental health. She chaired the NICE guideline on Antenatal and Postnatal mental health, has been a member of NICE and WHO guideline development groups on violence against women and public health, and has worked with Public Health England on preconception care. Her work contributed to the perinatal mental health impact case study for the Research Excellence Framework 2021.

Dr Timothy Powell

Lecturer in Translational Genetics & Neuroscience
Social, Genetic & Developmental Psychiatry Centre

Lithium, the elixir of youth?

Synopsis

Our population is ageing. Although longer lifespan is beneficial, when it is associated with an increased proportion of the population suffering from age-related diseases, it can pose an economic burden. Consequently, there has been an international effort to identify factors that can increase longevity and delay the onset of morbidity. Epidemiological evidence has highlighted an unexpected relationship between levels of lithium in drinking water and longevity. Lithium is also used in the treatment of bipolar disorder, and to understand if it could be repurposed as an anti-ageing drug, Dr Powell studied its mechanism of action in patients and in vitro. In his talk, he will share some of his findings.

Biography

Dr Timothy Powell is a lecturer in translational genetics & neuroscience at the Social, Genetic & Developmental Psychiatry Centre. His group uses multi-omic approaches to investigate biological mechanisms underlying complex traits, including psychiatric disorders. One of his key areas of focus is understanding why psychiatric disorder patients demonstrate higher rates of cell ageing. Dr Powell joined King's as an MRC-funded MSc/PhD student in 2009, following his undergraduate degree in Human Sciences at UCL. After completing his postdoctoral MRC Skills Development Fellowship in 2019, he took up a two-year visiting assistant professor position at Cornell University, returning in July 2021 to start his lecturer post.

Dr Latha Velayudhan

Senior Clinical Lecturer
Department of Old Age Psychiatry

10 Cannabidiol for neurodegenerative disorders

Synopsis

There is growing evidence that cannabidiol (CBD) may be useful in the treatment of psychosis. It is not addictive like some other substances in cannabis and has been found to be useful in treating anxiety and psychotic symptoms in people without dementia. Dr Latha's research seeks to test whether CBD is useful as a treatment for neuropsychiatric symptoms in people with Alzheimer's disease (AD) and Parkinson's disease (PD). She is conducting placebo controlled double blind randomised controlled trials (feasibility studies) to test whether CBD is acceptable and may work in people with AD and PD.

Biography

Dr Latha Velayudhan is a senior clinical lecturer in the department of Old Age Psychiatry. Dr Velayudhan is also a consultant psychiatrist at the South London and Maudsley NHS Foundation Trust and leads the Lewisham Memory Service. She is a clinician-academic with research interests in neurodegenerative disorders such as Alzheimer's disease (AD) and Parkinson's disease (PD). Her main research work includes investigating neuropsychiatric symptoms, smell identification dysfunction, biomarkers such as blood protein markers and neuroimaging, and conducting clinical trials, currently using cannabinoid medications for neuropsychiatric symptoms in AD and PD.

Dr Valeria Parlatini

Clinical Lecturer in Child & Adolescent Psychiatry
Department of Child & Adolescent Psychiatry

The Maudsley CYPHER cohort study: understanding the impact of the Covid-19 pandemic on the mental health of children and young people with pre-existing mental health conditions

Synopsis

The Maudsley CYPHER cohort study is one of the largest longitudinal studies in children and young people (CYP) with pre-existing mental health conditions. The study used an innovative digital system to survey the over 5,000 families under SLaM Child and Adolescent Mental Health Services (CAMHS) to understand how they were coping with the pandemic, and to integrate their responses with pre-Covid clinico-demographic information as extracted from CYP's health care records. In this talk, Dr Parlatini will present initial results on how baseline clinico-demographic characteristics interplay with pandemic-related factors to affect mental health outcomes in CYP with pre-existing mental health conditions.

Biography

Dr Valeria Parlatini is a clinical lecturer and specialty registrar in Child & Adolescent Psychiatry at King's College London and South London and Maudsley NHS Foundation Trust. Her research aims to identify multivariable predictors of mental health outcomes that can be used to personalise and improve clinical care. She received three international awards, including the Young Scientist Award at the 2015 World Congress on ADHD. Recently, she has been awarded the Academy of Medical Sciences Starter Grant to investigate the impact of the Covid-19 pandemic on the mental health of children and young people with pre-existing mental health conditions.

Professor Ted Barker

Professor of Development & Psychopathology
Department of Psychology

# XCEPT research project

Synopsis

The XCEPT project seeks to better understand the factors that shape violent and peaceful behaviour in fragile and conflict-affected states. The team specifically looks at how conflict traumas affect mental health and pathways to violent and peaceful decision-making over time. They focus on three conflict-affected countries: Iraq, Syria, and South Sudan. The project is using a mixed-methods approach with two waves of survey and qualitative field interviews to follow up on important themes, and are also collecting biological samples.

The team is interdisciplinary in its composition – comprising of experts in trauma, epigenetics, neuroscience, psychology, memory, gender, war, and terrorism – allowing us to better examine the factors which shape violent and peaceful behaviour.

Biography

Ted Barker is Professor of Development and Psychopathology. He investigates how stressful environments exacerbate underlying vulnerabilities to affect children's development. He is broadly interested in the association between early adversity and later child and adolescent mental health problems, with a keen eye toward extremism, crime and violence. Most recently he has been investigating the degree to which biology (eg epigenetics, brain imaging) can help explain how early adversity can have long-lasting impacts on health and wellbeing.

Dr Maria Antonietta Nettis

Clinical Research Associate
Department of Psychological Medicine
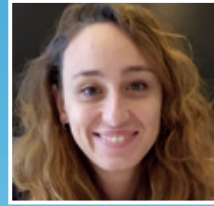
Research on anti-inflammatories medications in Major Depressive Disorder

Synopsis

In this presentation, Dr Nettis will briefly summarise her findings on the association between inflammation, depression and metabolic pathways such as the Kynurenine pathway. In a recently completed randomised control trial, she found preliminary evidence that minocycline could be used to augment antidepressants in patients with treatment-resistant depression and increased peripheral inflammation. In the same sample, patients with suicidal ideation showed increased levels of Kynurenine/Tryptophan ratio and minocycline seemed to reduce the proportion of suicidal patients over time.

Biography

Dr Maria Antonietta (Etta) Nettis is an academic psychiatrist with a strong interest in the interplay between body and mind in psychiatric conditions. As a psychiatrist, she currently works at the National Psychosis Unit, Bethlem Royal Hospital. Her PhD at the IoPPN focussed on the role of the immune system in the development and treatment of depression and other psychiatric disorders. Currently, she is supporting research delivery for studies conducted within South London and Maudsley NHS Foundation Trust. She is actively involved in the IoPPN network promoting diversity and inclusion and gender equality in STEM.

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The role of the father in reducing risk of depression within families
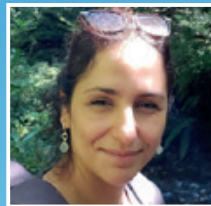
Synopsis

Depression can run in families – but family processes are complex. Here, we shine a light on fathers in these within-family processes. We found that specific depression symptoms played a role in the co-occurrence of depression within families. However, if fathers were warm and supportive to the child and the mother, then the risk of depression in children was substantially reduced. Our findings show the importance of including fathers in interventions, an area where fathers are under-researched and often under-valued.

Biography

Alex Martin is an ESRC funded doctoral student investigating the role of the father in the aetiology of behavioural and emotional problems in children. Her current research examines how father behaviour towards the child and the mother can act as a protective factor to children in high-risk circumstances. She is part of the Developmental Psychopathology lab and is co-supervised by Professor Ted Barker and Professor Barbara Maughan.

Dr Zina Ibrahim

Lecturer in Computer Science for Health
Department of Biostatistics & Health Informatics

Predicting clinical outcomes from electronic health records data – challenges, status and outlook

Synopsis

The ability to perform accurate prognosis of patients is crucial for proactive clinical decision making, informed resource management and personalised care. Although deep learning models have found great interest in prognosis from imaging data, there has been little uptake of such models when predicting clinical outcomes from patient electronic health records. Dr Ibrahim's research aims to address the limitations of black-box deep learning models and build explainable and user-centric computational frameworks that can robustly predict clinical deterioration from highly-dimensional, noisy and possibly biased clinical data.

Biography

Dr Zina Ibrahim is a software engineer and a computer scientist. Her research spans the formulation of Artificial Intelligence techniques to improve biological knowledge discovery and healthcare delivery. Currently, she is a lecturer in computer science for health at the Department of Biostatistics & Health Informatics. She is highly interested in the application of knowledge representation, machine learning, and multi-agent systems in biomedical settings.

Dr Charlotte Russell

Senior Lecturer
Department of Psychology

16 Understanding and ameliorating age-related memory changes

Synopsis

Our subjective sense of recalling an event from our life changes as we age. This sense of recall is important as it maintains our confidence in our memories. Disconnect between the accuracy of our memory and our confidence in this ability – known as metacognition – is harmful to the mental well-being of older adults. In her talk, Dr Russell will discuss her research involved with understanding the reasons for metacognitive changes to memory in ageing. This includes studies using non-invasive brain stimulation to enhance individuals' subjective sense of recollection, and qualitative work investigating the factors underlying older adults' concerns about their memory.

Biography

Dr Charlotte Russell is a senior lecturer in the Department of Psychology. She completed her PhD at UCL and was subsequently awarded an MRC Research Training Fellowship at the Institute of Neurology, followed by an ERC Marie-Curie Fellowship at the Fondazione Santa Lucia in Rome, Italy. Dr Russell came to King's as part of the team who developed and launched the inaugural undergraduate degree at the IoPPN. Her group focuses on the cognitive and neural basis of episodic memory, specifically how the mental representations we use when remembering relate to our sense of self, and how this is affected by age.

Dr Philip Holland

Senior Lecturer
Wolfson CARD

New horizons in migraine therapy

Synopsis

Migraine is one of the leading causes of years lost to disability with over one billion sufferers globally. Dr Holland will discuss recent progress made by the headache group at King's, exploring the bench to bedside translation of new therapeutics and potential therapeutic targets.

Biography

Dr Holland's research is focused on developing a greater understanding of the mechanisms underlying migraine and other headache disorders, with a particular current interest in how altered circadian and homeostatic mechanisms can influence migraine attack susceptibility. A neuroscience graduate from Glasgow University, he then completed his PhD at UCL, before postdoctoral work at UCL, San Francisco and Edinburgh. He joined King's in 2013 as a lecturer and is now a senior lecturer as part of the translational headache research group and has recently moved to the Wolfson CARD.

Dr Una Foye

Research Associate
Department of Health Service & Population Research

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Consider male eating disorders: a creative approach to improving treatment in primary health care for men and boys with eating disorders
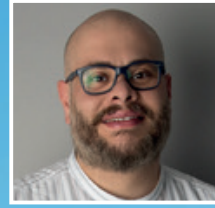
Synopsis

This THE award-winning project focused on understanding issues around food experienced by men in a clinical setting at primary care level where GPs and others may not be aware of the dimensions of eating disorders in males that require their own particular responses. The project utilises a co-developed animation film to equip practitioners with knowledge and skills to improve the experience of men and boys with eating disorders. Dr Foye will present a unique toolkit including a creative animation that aims to increase knowledge and heighten the readiness of GPs and others at primary care level to consider eating disorders in men.

Biography

Dr Una Foye's work has focused on understanding individuals' experiences of living with mental health problems to help improve how to develop and improve services to meet the needs of those using them. This interest comes from her work in the third sector providing support services to young people with eating disorders in Northern Ireland. She completed her PhD at Ulster University, exploring the role of emotional intelligence in the onset and maintenance of disordered eating. She has published and presented a number of papers to help develop an understanding of how to utilise emotions within interventions and recovery.

Dr Ahmad Al Khleifat

Research Fellow
Maurice Wohl Clinical Neuroscience Institute

The identification of the clinical stage at which treatment is most effective in ALS

Synopsis

Riluzole is the only drug to prolong survival for amyotrophic lateral sclerosis (ALS) and, at a dose of 100 mg, was associated with a 35 per cent reduction in mortality in a clinical trial. A key question is whether the survival benefit occurs at an early stage of disease, late stage, or is spread throughout the course of the disease. To address this question, Dr Al Khleifat and a team of MND researchers used the King's clinical staging system to do a retrospective analysis of data from the original dose-ranging clinical trial of Riluzole.

Biography

Dr Al Khleifat is a research fellow in complex disease genetics at the Maurice Wohl Clinical Neuroscience Institute. Dr Al Khleifat's research focuses on multiomics comparative analysis using big data to develop methods and diagnostic tools for researchers and clinicians. He leads The Drug Discovery and Trials Optimisation Working Group in the DEMON international network for data science and AI applied to dementia. He is also the Chair of the Trans-Ancestral Genetics group in one of the largest whole genome single disease sequencing projects in the world: Project MinE.

Dr Ewan Carr: Open Research Award winner

Statistician Research Fellow
Department of Biostatistics & Health Informatics

We need systemic solutions for open science

Synopsis

Much progress has been made towards the proliferation of open science practices in psychiatry, psychology and neuroscience. The replication crisis is widely reported and acknowledged. There is growing acceptance of the need for inclusive, accessible and transparent research. We even have awards for Open Science. Yet most initiatives have emphasised individual responsibility rather than systemic solutions. This talk will consider the journey ahead for open science and how tackling the bigger obstacles of research culture and misaligned priorities will take a coordinated response from funders, publishers, and policymakers.

Biography

Dr Ewan Carr is a NIHR Maudsley Biomedical Research Centre statistician and research fellow at the Department of Biostatistics & Health Informatics. He gained his PhD in Social Statistics (University of Manchester, 2014) and previously worked at the Research Department of Epidemiology & Public Health, UCL. He is interested in exploring links between mental and physical health; and statistical techniques for longitudinal analyses of routinely – or remotely – collected data.

Professor Peter Goadsby: keynote speaker

Professor of Neurology
Wolfson Centre for Age-Related Disease

Cluster headache –
translating science to the bedside

Synopsis

Cluster headache is a relatively rare primary headache disorder that consists of attacks of very severe pain with associated features occurring in bouts (clusters) for typically eight to ten weeks a year. The attacks last some one to two hours, occur very often some hours after sleeping and have been described by patients as the worst pain they have ever experienced. Professor Goadsby has established an experimental model which studies the disorder using experimental medicine approaches, and delivered on clinicals of new therapies for this very disabling condition.

Biography

Peter Goadsby is Director of the NIHR King's Clinical Research Facility and Honorary Consultant Neurologist at King's College Hospital. He is an Honorary Consultant Neurologist at the Hospital for Sick Children, Great Ormond Street, and a NIHR Senior Investigator. His major research interests are in the basic mechanisms of primary headache disorders, such as migraine and cluster headache, in both experimental and clinical settings, and translating these insights into better management.

Elka Giemza

Facility Manager
NIHR Wellcome Kings Clinical Research Facility

What is the Clinical Research Facility?

Synopsis

This brief talk will give an overview of what the Clinical Research Facility (CRF) is, where it is, what's in it and who can use it.

Biography

Elka Giemza is the Clinical Research Facility manager. A nurse by training, she previously ran another research facility for vaccine development at St George's Hospital before joining the Trust in 2011 to set up the NIHR/Wellcome King's Clinical Research Facility at Denmark Hill. The CRF is a facility designated for clinical research and is funded by a NIHR grant, managed through South London and the Maudsley Hospital, and serves all the King's Health Partners.

Dr Nicolaas Puts

Senior Lecturer
Department of Forensic & Neurodevelopmental Sciences

Sensory differences in Autism

Synopsis

Sensory differences are common in conditions such as autism or ADHD. Increasingly, studies are showing that sensory differences contribute to core symptoms of these conditions. In Dr Puts' work, psychophysical approaches are used to measure low-level tactile perception in children with autism and ADHD and have shown that differences in tactile perception are condition-specific. In his talk, Dr Puts will show that differences in tactile perception are associated with brain measures of GABA and glutamate, linking cortical mechanisms to behavioural outcome.

Biography

Dr Nicolaas Puts is a senior lecturer in the Department of Forensic & Neurodevelopmental Sciences. He did his PhD at Cardiff University, spent the next eight years at Johns Hopkins University in Baltimore, and then joined King's in 2020. Using multi-modal approaches, his lab focuses on studying the underlying mechanisms of sensory differences in neurodevelopmental conditions, and the impact of sensory differences on core clinical symptoms. He also supports PhD and ECR mentorship and training.

Dr Rita Sousa-Nunes

Lecturer in Developmental Neurobiology
Centre for Developmental Neurobiology
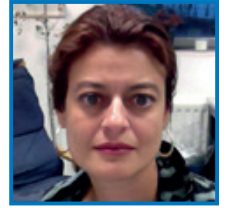
Cellular quiescence uncouples the proteome from the transcriptome

Synopsis

Stem cell proliferation regulates development, maintenance, and repair of tissues. In the adult central nervous system, it also modulates cognition and mood. Mechanisms have evolved to keep stem cells pristine to replenish tissues as needed. One such mechanism is cellular quiescencea protective state that consists in reversible cell-cycle arrest and low biosynthetic activity. Cancer stem cells too can undergo quiescence, rendering them therapy resistant.

Despite clinical relevance, quiescence is poorly understood and defined functionally given lack of markers. Dr Sousa-Nunes recently discovered that altered nucleocytoplasmic partitioning and nuclear accumulation of polyadenylated RNAs are novel evolutionarily conserved hallmarks of quiescence. Furthermore, nuclear accumulation of messenger RNA in quiescent neural stem cells largely predicted protein downregulation, accounting for uncoupling between transcriptome and proteome in quiescence.

Biography

Dr Rita Sousa-Nunes holds a degree in biochemistry by the University of Lisbon, and a PhD in Developmental Biology by UCL. Her postdoctoral work (in London and Singapore) applied the power of fly genetics to research neural stem cell asymmetric division and quiescence. She has obtained various studentships, fellowships and awards, and in 2012 started her laboratory at King's College London, supported by a Cancer Research UK Career Development Fellowship. Dr Sousa-Nunes' lab studies neural progenitor behaviours and how disruptions therein can lead to malignancy. They utilise Drosophila and mammalian cells as well as human glioblastoma tissue in their research. She is a passionate communicator and educator, and regularly participates in initiatives engaging the public and young students with science.

Dr David Andersson

Reader
Wolfson Centre for Age-Related Diseases

Passive transfer of fibromyalgia from patients to mice

Synopsis

Fibromyalgia syndrome (FMS) is characterised by widespread pain and tenderness, and patients typically experience fatigue, memory problems, and emotional distress. The aetiology and pathophysiology of fibromyalgia have remained unexplained and there are no effective drug treatments. Dr Andersson and colleagues have discovered that administration of immunoglobulin G (IgG) from FMS patients to mice transfers sensory, motor, and anatomical symptoms. These passively transferred symptoms are associated with nociceptor hyperexcitability and the study showed that FMS IgG displays autoreactivity. The findings reveal that FMS is an autoantibody mediated condition and will accelerate development of the first mechanism-based therapies and diagnostic tests for this challenging condition.

Biography

Dr Andersson's PhD studies in Lund (Sweden) led to identification of the endocannabinoid lipid anandamide as the first endogenous agonists of TRPV1 (or any TRP). He joined Professor Stuart Bevan at Novartis in London as a post-doctorate on a project where three novel TRP channels were cloned and characterised in collaboration with Ardem Patapoutian. After moving to King's, his continued work included the identification of TRPA1 as a target for paracetamol, and TRPM8 as an osmosensor that controls eye blinking. More recently, his lab has pioneered autoantibodies as the cause of pain and other symptoms in Complex Regional Pain Syndrome and fibromyalgia.

Alexandra Hertz: 3 Minute Thesis finalist

Department of Forensic & Neurodevelopmental Science

# Aggression and reward in autism spectrum disorder

Synopsis

Aggression is a common form of challenging behaviour among individuals with neurodevelopmental disorders such as autism. Aggression has serious detrimental effects, yet we lack effective treatments. We aim to investigate the neurobiological underpinnings of autism-associated aggression using mice with an autism-associated genetic mutation. We showed that mutant mice exhibit not only increased rates of aggression, but also place preference for the aggression-paired context, suggesting that aggression may be a rewarding experience for them. This aggression was corelated with increased activity of the reward brain circuitry, suggesting that the reward system could be a potential new drug target for autism-associated aggression.

Biography

Alexandra Hertz started her PhD at King's College London in February 2019 after a BSc in Psychology and Neurosciences from McGill University and a MSc in Neuroscience from the University of Strasbourg (Joint program between the universities of Strasbourg, Freiburg and Basel). She aims to identify the neurobiological underpinnings of irritability and aggression in autism spectrum disorders (ASD) and in psychopathy, with a focus on the rewarding and aversive components of aggression. She will explore these processes in mouse models and in individuals with ASD and individuals with psychopathy using functional MRI investigations of frustration within reward learning tasks.

Professor Cathryn Lewis

Professor of Genetic Epidemiology and Statistics
Social, Genetic & Developmental Psychiatry Centre
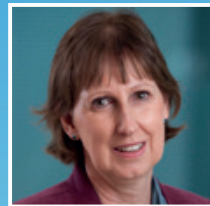
Polygenic scores in mental health: prospects and pitfalls

Synopsis

Polygenic scores capture the genetic component to mental health disorders and related traits in a single number which gives an individual's genetic loading. As our knowledge of the specific genetic variants contributing to psychiatric disorders increases, polygenic scores have become a valuable tool in research studies to assess risk, dissect heterogeneity, and determine common genetics across traits. In depression, those with the lowest and highest 10 per cent of polygenic scores show a four-fold difference in risk. In this talk, Professor Lewis will describe the progress made highlighting both the opportunities and challenges in translating polygenic risk scores to clinical implementation.

Biography

Cathryn Lewis is Professor of Genetic Epidemiology and Statistics, and Head of Department at the Social, Genetic & Developmental Psychiatry Centre. She is theme lead for biomarkers and genomics in the NIHR Maudsley Biomedical Research Centre, and co-chairs the Psychiatric Genomics Consortium Major Depressive Disorder working group. Her research identifies and characterises the genomic contributions to mental health disorders and treatment response (pharmacogenetics). She has led genome-wide association studies in depression and related psychiatric traits. A major research focus is risk assessment, determining how the polygenic component of mental health disorders can be measured accurately and its implications communicated effectively.

Dr Paolo Deluca

Reader in Addiction Research
Department of Addictions

From ELIZA to PAHOLA, electronic interventions for harmful alcohol use

Synopsis

In the last twenty years addiction research and treatment has harnessed and integrated emerging technologies, often with mixed outcomes. Dr Deluca's talk will provide a brief overview of the work he led in developing and assessing the first smartphone application, SIPS city, for the delivery of alcohol brief intervention targeted to both low and high-risk drinking adolescents. He will also discuss the latest research developments using transdermal alcohol devices and more advanced digital chatbots, like PAHOLA, the first digital health specialist on alcohol use.

Biography

Dr Paolo Deluca is reader in addiction research, with over twenty years' experience in the addiction field. He has led work investigating the emerging novel psychoactive substances (NPS) phenomenon (Psychonaut 2002) and developed an early warning system harnessing user generated online content (Psychonaut EWS). He has been awarded grants to deliver prevention services addressing the use of NPS in vulnerable individuals using the Internet and other ICTs (ReDNet), and the real-time monitoring of the availability and distribution of NPS over the Internet (CASSANDRA). He has also led cutting-edge work in developing electronic screening and brief interventions through smartphone apps (SIPS jr), and the development and implementation of new alcohol interventions for patients with alcohol dependence (ACTAD) and hospital frequent attenders (AAOT). His work also includes health service and treatment provision assessment in England (ANARP), Scotland (SANA), and Europe (AMPHORA), as well as an evaluation of the effects of the introduction of Minimum Unit pricing for alcohol in Scotland (MUP).

Dr Sandra Vieira

Sir Henry Wellcome Research Fellow
Department of Psychosis Studies

Multimodal normative modelling in early psychosis

Synopsis

At the moment, it is not possible to reliably predict if an at-risk individual will experience a psychotic episode or if an early psychosis patient will respond to treatment. Critically, most studies so far have relied on the traditional case-control design, which is at odds with the continuum and heterogeneity of psychosis. In this talk, Dr Sandra Vieira will discuss how this discrepancy may help explain the lack of clinical translation of psychosis research so far and how normative modelling may help address this issue by allowing researchers to map the heterogeneity of brain-behaviour interactions during the early stages of psychosis.

Biography

Dr Sandra Vieira is a clinical psychologist and a Sir Henry Wellcome Research Fellow at the Department of Psychosis Studies. Her research is focused on the development of diagnostic and prognostic prediction models in psychosis using neuroimaging, neurocognitive and clinical data. Dr Vieira completed her training in clinical psychology at the University of Coimbra in 2012. She then moved to the UK and obtained a MSc in Psychiatric Research (2014) followed by a PhD in Psychosis at the IoPPN (2019). Her current project aims to map the heterogeneity in the early stages of psychosis as a deviation from the normative brain-behaviour interaction.

Dr Emily Hird: Open Research Award winner

Postdoctoral Research Associate
Department of Psychosis Studies

Open research: why do it?

Synopsis

Making research methods and outputs openly available to everyone – known as open research – is increasing in popularity. Yet, doing it adds work to an already pressured research process. So why do it? In this talk, using examples from her own research, Dr Hird will highlight key benefits of open research, including better reproducibility, collaborations, and impact, and discuss the importance of open research for patients in translational research.

Biography

Dr Emily Hird's PhD used electroencephalography to examine the neurocognitive basis of the placebo response to pain at the University of Manchester. She then joined King's in 2018 as a research associate. Here she works on large-scale research projects which combine multimodal data to predict outcomes in psychosis (BBC, STEP, PSYSCAN, NEUTOP, EU-GEI). Dr Hird's research combines neuroimaging and cognitive measures to examine how the brain formulates reality through learning and how this generates unusual experiences like the placebo response and psychosis. She aims to use these mechanistic insights to improve clinical outcomes in psychosis, using methods such as computational modelling and machine-learning.

Dr Ryan Patel

Research Associate
Wolfson Centre for Age Related Diseases

The impact of descending pain modulation on spinal amplification mechanisms – from the rat dorsal horn to human psychophysics

Synopsis

In this translational study we investigate the effect of conditioned pain modulation on temporal summation of pain and electrically induced central sensitisation. The former is often simplified as 'pain inhibits pain' where application of two distant noxious stimuli can produce analgesia, whereas the latter two represent pain amplification mechanisms. As previous pre-clinical studies reveal these mechanisms converge upon the spinal cord, we have obtained in vivo electrophysiological recordings from rat dorsal horn neurones while applying these paradigms concurrently to investigate how these opposing mechanisms interact. In pain-free healthy human subjects we applied identical experimental paradigms and performed quantitative sensory testing to examine whether the neural substrates relate to the perceptual outcomes. Our future goal is to provide insight into the heterogeneity of pain generating mechanisms in people living with chronic pain which could potentially improve treatment selection.

Biography

Dr Ryan Patel is a post-doctoral research associate in the Bannister Lab based at the Wolfson CARD. He read Natural Sciences at King's College, Cambridge before going on to complete a PhD under the supervision of Professor Tony Dickenson at UCL. He has authored 30 research articles/reviews/book chapters in the fields of neurophysiology, neuropharmacology and pain modulation. Dr Patel's current work combines optogenetic, electrophysiological and behavioural approaches to identify top-down circuits that mediate descending control of pain. His research interests also include bridging the gap between bench and bedside.

Dr Peter Hawkins

Postdoctoral Research Associate
Department of Neuroimaging

Neuroimaging in clinical trials

Synopsis

Treatment resistance impacts a large proportion of people with debilitating psychiatric illnesses, with around a third of people with schizophrenia or depression failing to respond to available pharmacological treatments. The high failure rate of new compounds translating from promising preclinical work into successful late phase human trials, combined with the prohibitive cost of these development pathways, means the clinical availability of new and efficacious treatments is limited. Utilising MR imaging in early-stage human trials as part of a proof of activity approach can offer additional insight into the action of a novel compound early in its development and can provide essential information on its influence on brain physiology and function.

Biography

Dr Peter Hawkins completed a BSc in Psychology in 2004 and an MSc in Cognitive & Clinical Neuroscience in 2009. After spending several years working with acute psychosis patients for the NHS in north London, he moved to the Centre for Neuroimaging Sciences (CNS) at the IoPPN in 2012 and completed his PhD in neuroimaging under the supervision of Professor Mitul Mehta and Dr Anthony Vernon in 2017. During his time at the CNS he has worked on several clinical trials utilising different MRI techniques (task and resting-state BOLD, ASL, relaxometry, diffusion imaging) to study the action of current and novel psychiatric medications in the brain.

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