Better Sleep

NIHR | Oxford Health Biomedical Research Centre

Better Sleep
Exploiting sleep and circadian science to develop and test interventions that will improve health

BETTER SLEEP MATTERS

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Spring 2024

FROM THE EDITOR'S CHAIR

Welcome to the second issue of our Better Sleep Matters Newsletter! I hope you will find plenty to inform and interest you, but please give us your feedback, and also any suggestions of topics for future issues.

It's amazing how time passes, isn't it? Spring has already arrived and with it the first anniversary of the Oxford Health BRC. As you will see in this issue our Better Sleep theme leads got together to reflect on how things have been going, and to plan ahead for year two. There were plenty of successes to celebrate in terms of grant awards and publications, with many more research ideas, funding applications and manuscripts in the pipeline.

You will also read about how some of our laboratory facilities and associated clinical studies, about international collaborations and visitors, about teaching and training in sleep medicine, and about our contributions to World Sleep Day, amongst other things. However, I want to specifically mention our Pump Priming awards, for two reasons. First, hearing from our awardees in the last round was a highlight of our theme's review event.

They introduced themselves and their work in the last newsletter, but we were thrilled to learn of the progress they have made enabled by the relatively modest resources associated with the priming scheme. Second, and importantly, applications are now open for the next round, with a deadline application of 15th June. Please share this information, or perhaps even apply yourself!?

Wishing you all the very best, and of course … sleep well!

Colin

Colin Espie
Professor of Sleep Medicine, University of Oxford

RESEARCH MATTERS: PUMP PRIMING APPLICATIONS NOW OPEN

- Cognitive behavioural therapeutics (CBT and its component therapies)
- The role of nutrition, cardio-metabolic factors and exercise
- Understanding the stress response
- The benefits of natural and artificial light interventions
- Developing novel markers and outcome measures
- Improved monitoring sleep and circadian processes
- The application of data science methodologies at scale

NIHR Oxford Health BRC theme Better Sleep is pleased to announce its second round of pump-priming grants.

These are available to all University of Oxford, University of Surrey and NHS groups working on projects falling within the scope and aims of the Better Sleep theme. Novel projects addressing sleep and circadian biology and medicine in human participants will be considered. Applications are open to anyone working with or sponsored by an OH-BRC Better Sleep key researcher. Pump priming grants are expected to provide pilot/proof-of-concept data to support future grants and fellowship applications. Applications from early-career researchers are welcomed.

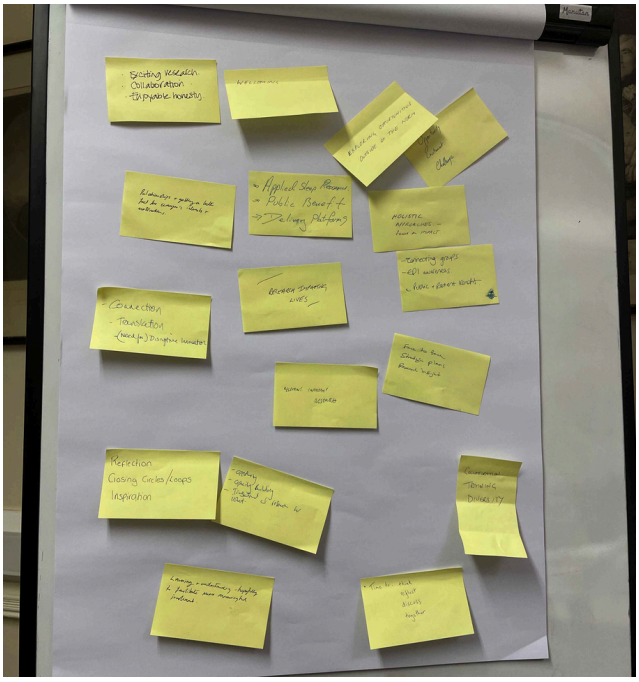
Grants are available for up to £12,000. **The deadline for application is 17:00 on 17th June 2024**. Funds must be spent by 31st March 2025.
Please contact Dr Ma'ayan Semo for more information: bettersleep@ndcn.ox.ac.uk.

BETTER SLEEP TEAM MATTERS

As we complete our first year of the Better Sleep Theme within the NIHR Oxford Health Biomedical Research Centre, the team ran a strategic away day to reflect on the past year and plan for year 2 of the theme. This event took place over two days, and all members of the management group attended.

We were also joined by three members of the Better Sleep Research Advisory Network (BSRAN): Richard Mandunya, Vanessa Bennett, and Douglas Findlay.

The event began with discussions of current research and mapping these to our theme aims. We then had an open discussion of what we are doing well, and what areas could be improved upon.



We were then joined by the awardees of the year one pump-priming grants, who gave updates on their projects. We also heard from the University of Surrey collaborators and discussed ways to combine resources and ideas for collaborative grants.

After an evening dinner and sleep, the final morning focussed on strategy and goal setting for year two of the theme led by theme co-lead Professor David Ray and PPIEP lead Dr Leah Holmes.

The sessions were really insightful. The BRSAN members noted our strong PPIEP involvement within the current work and suggested ways in which we can utilise the network at all levels of research, including adding members as collaborators to the small pump-priming grants.

It was an excellent end to year 1 and we are all excited to see what we can achieve together in year 2,

SCNi

Sleep and Circadian Neuroscience Institute

AWARD MATTERS

On the 18th of April, Better Sleep supported the Sir Jules Thorn Sleep And Circadian Neuroscience Institute (SCNi) by organising the annual SCNi Academic Award Medal Day.

This award is given out annually to sleep and circadian researchers or clinicians who have made an outstanding contribution to the field of sleep and circadian neuroscience.

This year's winner was Dr Daniel Buysse. The day began with research updates from members of the SCNi and invited collaborators. Over lunch there were posters from early career scientists showcasing the range of research within the group.

The day completed with an award ceremony and an engaging and insightful Prize Lecture by Dr Buysse - Multidimensional Sleep Health: From Concept to Clinic.

Congratulations to the 2024 SCNi Academic Prize Medal Winner Dr Daniel Buysse, UPMC Professor of Sleep Medicine and Professor of Psychiatry and Clinical and Translational Science, University of Pittsburgh School of Medicine.

CONFERENCE WORLD

In March, the ERATO UK-Japan Joint Symposium on circadian rhythm and sleep took place in Oxford. This symposium is a great opportunity for Japan and the UK to share their research ideas and findings on human sleep and wakefulness, from the molecular level to individuals living in society. The scientific program was compiled by the organising committee that includes Prof. Russell Foster, Prof. Vladyslav Vyazovskiy, Associate Prof. Aarti Jagannath (all University of Oxford, UK), and Prof. Hiroki Ueda (The University of Tokyo, Japan). This symposium was supported by the Japan Science and Technology Agency, Maxwell Biosystems, and Mitsui Chemicals.

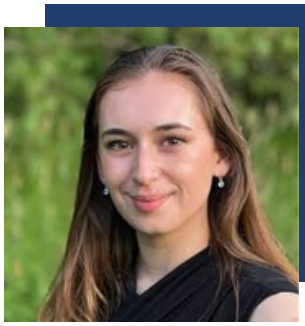
During the welcome ceremony, Professor Russell Foster, a member of the BRC Better Sleep Team and one of the symposium organisers, gave a warm welcome speech.

Several BRC Better Sleep Team members also presented their research during the 3-day symposium. Professor David Ray presented a special lecture on circadian misalignment and cardiometabolic disease. Professor Simon Kyle presented his research on behavioural interventions for sleep and circadian rhythm disruption.

Written by Katrina Tse (DPhil Student in Clinical Neurosciences)

> **"Disorders of sleep and circadian rhythmicity are prevalent and burdensome but too few people can access effective therapies. Systematically targeting cognitive, behavioural, and environmental factors can improve sleep and circadian health." Professor Simon Kyle**

RESEARCH MATTERS: STUDY SPOTLIGHT



Sleep, Ageing, and Memory Study (SAMS)
Led by Lucy Jobbins: DPhil Student in Clinical Neurosciences
Supported by BRC Better Sleep

Dementia is one of the leading causes of disability globally, with sleep problems often occurring early in the disease course and continuously worsening as the disease progresses. With this in mind, we are delighted to announce that the Sleep, Ageing, and Memory Study (SAMS) has started recruiting participants.

This study is recruiting people with a diagnosis of Mild Cognitive Impairment (MCI) and healthy ageing participants. It will provide an in-depth assessment of sleep and circadian disruption in the early stages of cognitive decline. Importantly, this will be one of the first studies to run polysomnography testing in participant's homes, as well as using cognitive assessments, sleep questionnaires, and actigraphy.

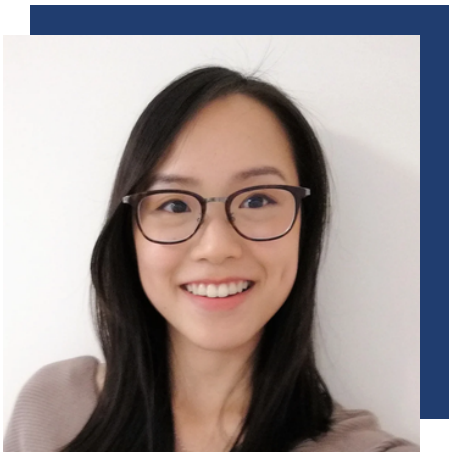
Patient and Public Involvement groups consisting of people living with MCI and dementia highlighted the importance of sleep problems in cognitive decline, and the preference of home testing. We hope that this project will provide answers around the importance of sleep in neurodegenerative conditions and pave the way for future interventions.

NEW PROJECTS - RESTORE STUDY

Dr Emily Stanyer, supported by Professor Simon Kyle and Dr Rachel Sharman, was awarded one of three BRC Better Sleep pump priming grants in August 2023.
The RESTORE project is currently recruiting.
See below for the study advert, and stay tuned for results in a future edition of Better Sleep Matters.

Trouble sleeping? Low mood or depression?

At the University of Oxford, we are looking for adults aged 18-65 years who have persistent problems getting to sleep and/or staying asleep and experience feelings of low mood.
If you are interested in taking part or would like more information, please click on the following link https://ecsm.fra1.qualtrics.com/jfe/form/SV_4IqyO6DWVJzE3Ea or contact the research team directly at RESTORE.study@ndcn.ox.ac.uk or call 01865 618 692



TEAM MATTERS: CONGRATULATIONS

Congratulations to Katrina Tse, a DPhil candidate in the Experimental and Clinical Sleep Medicine group, who recently submitted her thesis in February. Her thesis explores the role of emotional processing and regulation in the link between insomnia and depression. Her supervisors were Professor Simon Kyle and Professor Colin Espie.

"I feel incredibly thankful to Professors Simon Kyle and Colin Espie, as well as my collaborators, for being there for me every step of the way during my DPhil journey. Their support and guidance have meant the world to me. I am excited for the next chapter ahead and to continue my research as a postdoctoral researcher."

Katrina will be working on the Wellcome project investigating how sleep restriction therapy improves mental health in young people; a topic that goes hand-in-hand with the research she has already done in her thesis.

In February, Katrina also published her first paper on the systematic review and **meta-analysis of the effect of single-component sleep restriction therapy on depressive symptoms.**

Katrina successfully defended her thesis, with minor corrections, on the 17th of April 2024. Huge congratulations from all at Better Sleep.

TEAM MATTERS: INTERNSHIPS

The Experimental and Clinical Sleep Medicine group, led by Professor Simon Kyle and Professor Colin Espie, have hosted Maelwenn Le Roux from the University of Strasbourg for a six-month internship from January.

As her time with the group draws to a close, here is what she has to say about her time in the team.

I'm a French student studying cognitive neurosciences at the University of Strasbourg. I'm in the last year of my master's degree, and to validate my master's degree, I need to do a 6-month internship in order to write a memoir and give an oral presentation at the end of my internship.

Our teacher didn't encourage us to leave France, but I really wanted to discover a new country, meet new people, and improve my English. Even if it's difficult to study in England since Brexit, I really wanted to come to this country. Since I started to learn biology, I have worked with mice. I really wanted to learn more about human studies because that's what I want to do after. One of my favourite interests is sleep, and particularly sleep disorders. That's why I applied to join the NDCN team (without much hope).

Finally, Dr. Emily Stanyer replied to me, and since January, I have been working with her on the RESTORE study, interested in the effects of sleep restriction therapy for insomnia in people with depression. I am very grateful to be part of this team; each person teaches me so many things! There is a very good atmosphere in the team; it's the first time I've been in a lab, and I wasn't expecting that. To conclude, I am very happy to discover more in this domain, in this country, and working with Emily is amazing!

LAB MATTERS: MEET THE OCDEM CRU

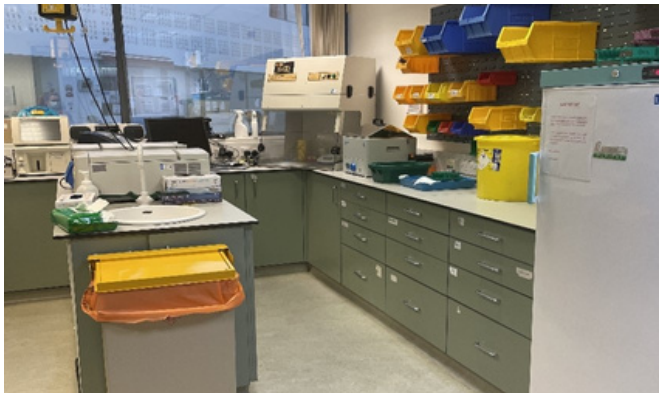
Nestled within OCDEM is the Clinical Research Unit (CRU), our hub of activity for translational research. We have eight dedicated research beds, including 2 en-suite rooms, a DXA scanner for body composition and bone density assessment, and a fully resourced laboratory. We have a fully equipped room to support metabolic studies including ultrasound, use of stable isotope and other equipment facilitating the measurement of a wide range of metabolic profiles.

Many participants in our studies are recruited from the Oxford Biobank, a collection of 30-50 year old healthy men and women living in Oxfordshire. For researchers the biobank is an immensely valuable resource, consisting of a local population who have consented to be approached, for participation in physiological studies of complex intermediary phenotypes.

For an individual to join the biobank they will be asked to attend the CRU for a detailed screening visit with one of our research nurses, including a blood sample and a DXA scan. With their informed consent the participant provides their information, DNA and agreement to be re-approached. The investigations utilising the Oxford Biobank usually focus on research into common diseases like diabetes, obesity and cardiovascular disease.

In 2015, a new cohort of Type 2 Diabetes Mellitus (T2DM) was introduced as part of the Oxford BioBank. Recruitment of men and women with T2DM aged 25-75 years will enable studies on physiological consequences of genetic mechanisms of the disease to better understand why some people are more resilient than others in developing adult chronic diseases.

LAB MATTERS: MEET THE OCDEM CRU



It is through the combination of highly experienced and skilled staff, alongside cutting-edge facilities, that we can offer a highly supportive environment for participants and researchers alike in which to perform world-leading clinical studies that can begin to make a real difference in patient care.

DXA

We measure total and regional fat using **D**ual Energy **X**-ray **A**bsorptiometry. The scanning arm, which carries the camera, passes over the body, typically taking 7-13 minutes. Measures include total body fat mass and superficial/visceral fat levels.

Ultrasound scanner

Many of our studies require blood samples, either by a single needle or by insertion of a cannula. When locating a vein by the traditional method, i.e., sight or palpation, is challenging the nurses are trained to use an ultrasound at the bedside.

Clamp procedures

We work with clinicians running glucose clamp procedures in studies measuring glucose metabolism, insulin secretion and insulin resistance. For this, multiple cannulas are inserted for infusions and blood sampling. The research nurse will monitor the glucose infusion rate to maintain blood glucose at the desired level.

Adipose Tissue Biopsies

Adipose tissue samples are obtained from the tummy or buttock. This can either be through a needle into the fat tissue or as a core sample.

Sleep

Our team have been working on a Digital Sleep Treatment for Metabolic Health, with the aim of determining the feasibility of recruiting participants with a high risk of diabetes who have insomnia. We have enjoyed working on this project, gaining a greater insight into the mechanism of sleep and circadian rhythms. As so many of us have experienced poor sleep on some level, having the opportunity to learn and engage with participants and researchers is fascinating. Our team is very much looking forward to working on further circadian rhythm projects.

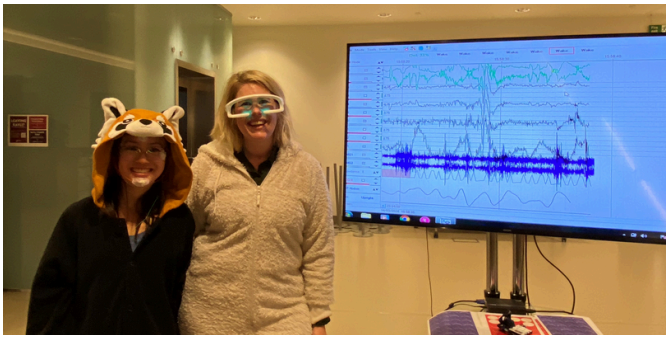
PEOPLE MATTERS: INVOLVEMENT WITH OUR RESEARCH

World Sleep Day 2024 was marked by several public outreach events.

At the John Radcliffe (JR) Hospital, the team involved was led by Dr Luca Ratti, and involved members of the Neurophysiology team, and Oxford researchers including Lucy Jobbins and Sumathi Sekaran from the Sleep and Circadian Neuroscience Institute (SCNi). The event was attended by over 100 people, including staff and patients at the JR.

Outreach events included artwork portraying experiences of sleep paralysis, meet the expert sessions on sleep apnea and REM behaviour disorder, and live polysomnography. SCNi researchers ran an interactive stall on the topics of sleep, wake, and body clocks, and why we sleep and how to sleep. People who attended really enjoyed talking about the 5 Principles of Good Sleep which were presented in a poster made by SCNi DPhil student Jeevun Grewal. The stall also included creating plasticine brains, a sleepiness and reaction time task, and chronotype questionnaires.

In our Dorothy Crowfoot building, Dr Rachel Sharman and Katrina Tse from our team delved into the fascinating world of sleep habits. They shared insights and discoveries, including a demonstration of live EEG technology! It was an eye-opening discussion that allowed us to explore the science of sleep together! Overall, the events were a great success and raised awareness of sleep health among researchers, clinicians, and the public.



Come visit the team for the BRC Open Day event on the 30th of May at the Westgate Shopping Centre to hear more about our research, see a live sleep recording, and take part in our giant board game, "The Race to Sleep".

TRAINING MATTERS: TEACHING AND TRAINING

Oxford Online Programme in Sleep Medicine

Now in its 8th year, the well established Oxford Online Programme in Sleep Medicine has trained over 150 students from more than 35 countries.
This month, four of our MSc students from Cohort 6 attended the graduation ceremony at the Sheldonian Theatre. Congratulations to Hannah, Laura, Jose, and Farah, who attended the graduation ceremony and to all MSc and PGDip students from Cohort 6.

Applications are now open for September 2024. To find out more please visit: bit.ly/OxfordSleepMedicine or email sleepmedicine@ndcn.ox.ac.uk and join one of our live online information sessions held on 25th June at 12pm and 7pm and the 25th July at 12pm and 7pm.

My enrolment in the MSc program in sleep medicine at the University of Oxford has been invaluable in equipping me with a thorough comprehension of sleep disorders, their profound effects on health and performance, as well as evidence-based diagnostic approaches and treatment modalities. This ongoing education has significantly enriched my knowledge and expertise in my field of conducting sleep-related health and performance research in highly demanding occupational roles (i.e., military), alongside significantly contributing to changes in policy related to sleep health in military trainees.

Dr Alex Rawcliffe, MSc sleep medicine student

Cognitive Behavioural Therapy for Insomnia Masterclass

Developed by Dr Dimitri Gavriloff and Prof. Colin Espie, this two-day online masterclass aims to give a grounding in Cognitive Behavioural Therapy for Insomnia to healthcare professionals.

Better Sleep offers several funding scholarships to applicants working within the NHS who fulfil NIHR NMAHP criteria or those working in the NHS in a therapeutic role. ***61 delegates attended the course on the 13th and 14th of May. 14 of those students were supported by Better Sleep scholarships.***

Click here to find out more about our next course.

SLEEP MATTERS: IN THE CLINIC WITH PROF. COLIN ESPIE

No-one stays completely still in bed. Normally movement reduces once we find a settled and comfortable position and fall asleep, and although we might shift around a bit during our sleep or during transitory night-time awakenings, it is usually not a problem to do so. However, many people have a sleep-related movement disorder, a category of sleep problem where repetitive movements interfere with sleep initiation or maintenance. The clinical classification systems refer to the most common sleep motor problems as ***Periodic Limb Movement Disorder (PLMD)*** and ***Restless Legs Syndrome (RLS)***.

PLMD is mainly associated with older age and involves muscle twitches in the limbs, particularly the legs, during sleep. These episodes of involuntary movement disrupt sleep, causing arousals mostly from light sleep, leading to complaints of daytime sleepiness and insomnia. The diagnosis of PLMD should be confirmed by polysomnography (PSG) showing that jerky leg movements are directly related to brief sleep arousals.

Of course, most people have experienced the occasional involuntary limb movement.

For example, many people get what we call ***hypnic jerks*** or ***sleep starts*** from time to time. These are sudden, brief jerky movements that occur at or around sleep-onset and waken us from light sleep. Hypnic jerks sometimes become a problem in their own right, but for most people they happen rarely. In some ways the movements in PLMD are similar to this except they occur repeatedly and throughout the night.

"We do not know exactly why people get PLMD. It may be related to disturbance of circadian sleep-wake rhythms in later life or to specific disorders of motor function that again occur more commonly in older adults."

There are some medications that help PLMD. The options are either sedative type drugs of the benzodiazepine family that reduce muscle function during sleep, or 'dopaminergic' agents that are used to treat neuromuscular disorders.

SLEEP MATTERS: IN THE CLINIC WITH PROF. COLIN ESPIE

RLS, as the name suggests, involves periods of irresistible urges to move the legs. These episodes are associated with unpleasant cramping sensations in the legs that are relieved only by walking or other movement or exercising of the legs. The symptoms begin mostly in the evening, potentially delaying the onset of sleep. So, they may occur when a person is resting or relaxing, and not only during sleep itself. When they interfere with sleep the usual result is sleep fragmentation and arousal. People with RLS may also suffer from significant daytime sleepiness. Normally people with RLS are able to give a clear picture of their problem and they may have had it a long time. Although many people with RLS are of middle age or older, about one-third of cases have their first symptoms before the age of 20 years.

The background to RLS is also a bit of a mystery, but like PLMD, there may be associated changes in dopamine neurotransmission. Some of these may be age-related. RLS has also been associated with pregnancy and with end-stage renal (kidney) disease.In pregnancy it usually presents in the third trimester and can be alleviated with iron supplementation, but typically resolves after the birth. Treatment of RLS is similar to that for PLMD, and indeed the two commonly go together.

Diagnostic systems also cover a number of other problems under the heading of sleep-related movement disorder, including ***sleep-related leg cramps***, ***sleep-related bruxism*** (jaw-clenching and teeth-grinding), ***sleep-related rhythmic movement disorder*** (e.g. body-rocking, head banging), ***benign sleep myoclonus of infancy*** (twitches or jerks that resolve during early development), and ***propriospinal myoclonus at sleep onset*** (sudden jerks of neck and abdomen which may or may not be associated with a spinal condition).

COLLABORATION MATTERS: KAVLI CORNER

Oxford's Kavli Institute for Nanoscience Discovery and our home Departments celebrated acknowledgement in FOUR categories at the Vice-Chancellor's Awards

CATEGORY: Community Partnership Award
WINNER: Supporting young people from African families in accessing science capital – History of Science Museum and Mathematical, Physical and Life Sciences (MPLS) scientists
CONGRATULATIONS TO THE TEAM including Associate Professor Weston Struwe (Kavli INsD & Department of Biochemistry)

CATEGORY: Innovation and Commercialisation Award
WINNER: Refeyn – Development and commercialisation of mass photometry: single molecule mass measurement
CONGRATULATIONS TO THE TEAM including founders Professors Justin Benesch and Philipp Kukura (Kavli INsD & Department of Chemistry) and others - Associate Professor Weston Struwe (Kavli INsD & Department of Biochemistry)

CATEGORY: Inclusive Teaching and Assessment Award
SHORTLISTED: Diversification of assessments in Sleep Medicine
CONGRATULATIONS TO THE TEAM including Professor Simon Kyle, Dr Sumathi Sekaran, Dr Rachel Sharman, Dr Sofia Pereira, Dr Dimitri Gavriloff, and the sleep medicine team (Kavli INsD and Nuffield Department of Clinical Neurosciences)

CATEGORY:Research Culture Award
SHORTLISTED: X-NET: Removing barriers for collaborative & inclusive interdisciplinary research – Oxford University (Weatherall Institute of Molecular Medicine and the Kavli Institute); University of Edinburgh; University of Aberdeen; University of Dundee
CONGRATULATIONS TO THE TEAM on behalf of the multi University project including Associate Professor David Sims and Dr Charlotte George (Weatherall Institute of Molecular Medicine) and Désirée Tennant (Kavli INsD and Medical Sciences Division)

Better Sleep

BETTER SLEEP MATTERS

UPCOMING RESEARCH PROGRAMMES

Wellcome Trust: An international task force to create adaptive bio-psycho-social and environmental models of sleep, circadian rhythms, and youth depression and anxiety across five continents - This is a multinational project led by Prof. Bei Bei in Monash University, Australia, with Prof. Russell Foster leading the UK site with Dr Gaby Illingworth. This programme will lay essential groundwork to bring together efforts from across continents and disciplines to create a validated framework that incorporates bio-psycho-social and environmental factors associated with both the individual and the contexts in which they live to guide the development of prevention and intervention programs. Outcomes will be directly translatable to research, clinical and educational practice, as well as policy changes.

NEW STARTERS

Welcome to Nicola, Katrina, and Julian. They will be joining the Experimental and Clinical Sleep Medicine team under the supervision of Professor Simon Kyle to work on two Wellcome Trust projects.

SELECTED RECENT PUBLICATIONS

- Tse KYK, Maurer LF, Espie CA, Kyle SD. The effect of single-component sleep restriction therapy on depressive symptoms: A systematic review and meta-analysis. J Sleep Res. 2024 Feb 28:e14180. doi: 10.1111/jsr.14180. Epub ahead of print.
- Yuan H, Hill EA, Kyle SD, Doherty A. A systematic review of the performance of actigraphy in measuring sleep stages. J Sleep Res. 2024 Feb 21:e14143. doi: 10.1111/jsr.14143. Epub ahead of print.
- Meyer N, Lok R, Schmidt C, Kyle SD, McClung CA, Cajochen C, Scheer FAJL, Jones MW, Chellappa SL. The sleep-circadian interface: A window into mental disorders. Proc Natl Acad Sci USA. 2024 Feb 27;121(9):e2214756121. doi: 10.1073/pnas.2214756121
- Spitschan M, Kervezee L, Lok R, McGlashan E, Najjar RP; ENLIGHT Consortium. ENLIGHT: A consensus checklist for reporting laboratory-based studies on the non-visual effects of light in humans. EBioMedicine. 2023 Dec;98:104889. doi: 10.1016/j.ebiom.2023.104889.

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Designed by Dr Rachel Sharman and Dr Isil Senol