

PSYNAPSE

ISSUE 2

RCPSYCH
NEUROSCIENCE
PROJECT

KEEPING YOU IN TOUCH WITH

NEUROSCIENCE

Back with its second issue: *PSynapse*, the newsletter that keeps you in touch with Neuroscience!

2019 has been an extraordinarily busy year for neuroscience at the RCPsych!

Over 200 people took part in Brain Camps in Manchester, Leeds, Luton and Belfast. These hugely successful events brought clinically-relevant, cutting-edge neuroscience research into focus together with a special session on creative teaching of neuroscience. This is part of our on-going drive to embed the improvements to the MRCPsych Syllabus, support the high-quality teaching of Neuroscience and promote a high-quality educational experience for trainees around the country.

We worked intensively to lay the foundations for regional networks – “NeuroNets” – that will provide local hubs for collaboration and the further integration of Neuroscience and Psychiatry. New networks are now up and running in Yorkshire and across the English Midlands.

We have big plans for 2020, including more Brain Camps in Brighton, Exeter and elsewhere, a major event in Stirling (see inside this issue!) and exciting developments in resources for teaching and learning.

Visit [our pages](#) and stay up to date with all that’s happening in Neuroscience at the RCPsych!



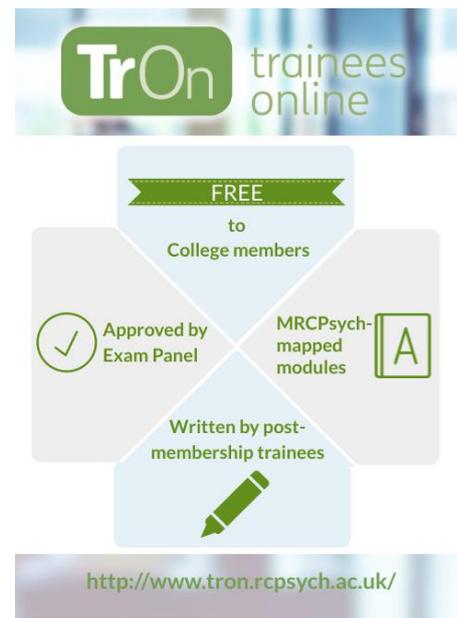
Preparing for the MRCPsych? Here's your one-stop shop!



Trainees Online (TrOn) provides eLearning modules covering the Basic Sciences syllabus to support trainees preparing for the MRCPsych exams. These modules are written by post-membership trainees and reviewed by the College Examinations Panel and an expert in the subject. Each module includes three items of 'Key Reading'. The module content plus this added reading is sufficient coverage for the purposes of the Membership exams.

Through the generous support of The Gatsby Foundation and the Wellcome Trust, the RCPsych Neuroscience Project is making TrOn the go-to resource for anyone revising the Neurosciences as they prepare for the MRCPsych exam. Existing modules are being revised and brought up-to-date, while new modules are being developed to provide a comprehensive resource perfectly aligned with the content of the syllabus.

TrOn is currently free to anyone registered with the College as a trainee, member or affiliate. Student Associates and Foundation Doctor Associates are entitled to access but will not receive this automatically, please contact us to arrange access for you at: tron@rcpsych.ac.uk



Unmissable: European neuroscience on your doorstep!

The highlight of the neuroscience calendar in 2020 is undoubtedly the [Federation of European Neuroscience Societies \(FENS\) Forum](#) taking place

from 11–15 July. And with next year's event being held in Glasgow, UK, the [British Neuroscience Association \(BNA\)](#) is proud and excited to be the Host Society, responsible for welcoming neuroscientists from around the world to enjoy a superb line-up of plenary speakers and special lectures, 56 parallel symposia, and more than 3,500 abstracts. To use FENS President, [Carmen Sandi](#)'s words to introduce FENS 2020, it will: "bring neuroscience at its best, combining seminal work with the newest discoveries and trends in brain research."



For the BNA, we're particularly excited to experience science from across Europe and beyond. It's vital for all of us that UK neuroscience remains integral to the European neuroscience community, so hosting this meeting means a lot. Indeed, the FENS Forum is an opportunity to celebrate our many current links and collaborations with our European partners and to plan collaborations well into the future.

Introductory Course: 'Improving mental health and psychiatric disorders: complementary preclinical and clinical research.'

Of particular interest to **PSynapse** readers, the BNA is running a range of pre-conference introductory courses on 10th July, one of which will focus exclusively on **neuroscience in psychiatric disorders**. This course will cover how preclinical and clinical research approaches can complement each other through translation and back-translation to lead to greater understanding of and improvement in treatment of mental health and psychiatric disorders.

This is an unmissable opportunity to receive a masterclass on the relationship between neuroscience and psychiatry, making vital connections and bridging the gap between the two fields.

Whether you're thinking of a possible new career direction, or simply interested in expanding your neuroscience knowledge, this course will give you some speedy and invaluable insights and learnings. Hosted by universities in Glasgow ([Strathclyde](#), [Glasgow](#) and [Glasgow Caledonian](#)), and taught by an expert, the course will take you from the basics to being confident in a whole new field – all in the space of one day!

The course is kindly supported by the Gatsby Foundation and brought to you by the RCPsych Neuroscience Project and the Academic Faculty of the RCPsych. Registration starts from only £26. For details of this and other introductory courses, and to register, see forum2020.fens.org/introductory-courses.

We think it's rather the perfect career-enhancing way to kick-start your time at [FENS Forum](#)!

About FENS 2020

The FENS Forum of Neuroscience is the largest international neuroscience meeting in Europe, involving all neuroscience societies members of FENS, and held biannually on every even year. The British Neuroscience Association (BNA) is proud to be hosting the 12th FENS Forum, 11th–15th July 2020 in Glasgow.

The RCPsych Neuroscience Project is proud to partner with the British Neuroscience Association, your voice in neuroscience.

Did you know, if you're a member of the BNA you automatically become a FENS member? That means [reduced-rate registration](#) to events including FENS 2020.

With high profile campaigns like '[Credibility in Neuroscience](#)', the BNA is ensuring we represent the voices of everyone, from neuroscientists to psychiatrists, students to the general public, and from neurologists to those working in the commercial sector.

Be part of a vibrant, forward-thinking community, for the price of one coffee a week (or much less!)ⁱ, and benefit from:

- Up-to-date news about events, lobbying and networking opportunities
- Free membership of the Federation of European Neuroscience Societies (FENS) and the International Brain Research Organisation (IBRO)
- Free or reduced registration rates for all BNA events
- The BNA Bulletin magazine
- Reduced APC charges for the BNA journal 'Brain and Neuroscience Advances'
- Up to 50% off Royal Society of Biology training events
- And much more

Join the community at www.bna.org.uk/register or **get in touch** at office@bna.org.uk

Let's advance neuroscience together.

Membership rates = £12 to £85 per year: see bna.org.uk/about/membership/#membership-categories





Brain Camp: What's all the fuss about???

*This year, four Brain Camps across the UK saw more than 200 psychiatrists engage with some of the country's foremost neuroscience researchers. In **Manchester, Leeds, Luton and Belfast**, we took a look at areas of research that are already making an impact on clinical psychiatry and others that are set to influence patient care in the future. Some of the science is complex, difficult to understand and even harder to explain. So, to help and support psychiatric trainers, we worked through some activities designed to build and enhance teaching strategies and communication skills.*

The Brain Camp concept

Brain Camps are not conferences – they are immersive workshops presenting selected recent advances in brain research and highlighting the relevance of this work to clinical psychiatric practice. As such, they're an update on brain research for neuroscience enthusiasts and for people whose knowledge may be a little rusty. Guest speakers are chosen for their outstanding skills as communicators, as well as their expertise in research. In 2019, examples of themes discussed are:

- *'how life events change our behaviour at the molecular level';*
- *'methodological developments in cognitive brain imaging';*
- *'brain stimulation and novel intervention strategies';*
- *'inflammation, blood-brain barrier dysfunction and dementia';*
- *'gene polymorphisms and drug response';*
- *'the neurobiological basis of resilience to depression';*
- *'exercise and the brain';* and
- *'computational neuroscience'.*

Topics are always under review and we welcome feedback and suggestions for future events.

Around half of a **Brain Camp** programme is taken up by experiential activities designed to encourage neuroscience teaching that is inspiring, engaging and motivating for learners. These creative, worked examples cover basic neuroanatomy, brain circuits and patient communication using group work, paired role plays and always with the principles of adult learning in mind. We keep the events small with no

The Essence of Brain Camp

Most trainers are not experts in neuroscience, but they need to be knowledgeable enough to teach the subject and must be skilled and confident enough to teach it effectively. '*Brain Camp: Inspiring Excellence in Neuroscience*' is a concept workshop, set up as a series of regional training events developed to address the needs of neuroscience educators in psychiatry. It is a one-day immersion in clinically-relevant neuroscience, consisting of two interwoven strands:

1. Refresher sessions on selected topics from cutting-edge neuroscience, presented by research-active, expert teachers from universities and research institutions (in collaboration with the *British Neuroscience Association*)
2. Workshops on innovative teaching strategies, facilitated by neuroscientists and educationalists

Brain Camps are open to everyone involved in teaching neuroscience in psychiatry. Places are limited to around 50 participants to facilitate group work and interaction with speakers. Impact is evaluated through pre- and post-event surveys and our data show a very positive response to training, with participants reporting feeling "more up-to-date on neuroscience" and "more confident" in their ability to teach neuroscience effectively. Brain Camp usually runs three times each year and travels to a different part of the UK for each event to make training accessible to as many educators as possible. Participants can also become members of a thriving 'Brain Camp' WhatsApp community through which they exchange ideas and inspiration, both during the workshop and on an ongoing basis.

With the brain in mind

Emanuele Osimo talks to ED BULLMORE about his career. Why did he choose psychiatry? What led him down the academic path? And how can psychiatry benefit from the progress being made in neuroscience?

PROFESSOR ED BULLMORE is one of the leading figures in UK psychiatry. He is Professor of Psychiatry and the current Head of Department at the University of Cambridge. His research has focused on brain network analysis in health and in psychiatric disorders and more recently on the interactions between the brain and the immune system. Besides his academic work, Ed is keen on involving the public in science and in 2018 published the bestselling book *The Inflamed Mind: A radical new approach to depression*. We spoke to Ed in Cambridge in June 2019.



Professor Bullmore, what led you to choose psychiatry?

I was always very interested in where mental health symptoms come from. Getting to the end of medical school, psychiatry seemed the most interesting area. I didn't want to spend most of my life talking to people about coughs and colds. By specialising in psychiatry, I could talk to people about much more complex and interesting experiences; it seemed clinically much richer.

In the late 1980s it was also not clear where these symptoms came from, and this was an area of medicine where it might be exciting to develop a research career because things were going to change. In comparison, in cardiology for example, the basic pathophysiology had already been discovered, and future discoveries would be incremental, whereas in psychiatry they would be more fundamental.

What personal factors make a good scientist?

Generally, with research, you need to have a real motivation. People pursuing their passion are going to be more successful in research. Find the research question that really fascinates you and build a research career on that, rather than taking a research job that isn't really close to home.

I had not thought all that seriously about going into academic psychiatry until one day I read an article in *Scientific American* about fractal geometry and I thought that it was so fascinating that people were coming up with mathematical ways of describing the shape of things. That could be relevant for medicine, and made me think: can you do fractal analysis of EEG data? Could that tell you something about psychiatric disorders? At the time it felt like an epiphany.

Then I was very fortunate. I found two people in the Institute of Psychiatry who were also interested in fractals, and one became my PhD supervisor. I had to learn computer programming, time series analysis,

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plus a lot of other skills that I had not really thought that I would want to acquire. Within a couple of years, I was the only young psychiatrist with computing skills, and that turned out to be a good career move.

What I would say to people is: focus on what you are interested in. Research is tough, and if you aren't doing something that you really care about, it can be disappointing. You have to focus on your question, find the right supervisor and support, and don't be afraid to be a bit different. There is a bit of a herd mentality in research, but if you can be productively different, in the medium term you are more likely to be competitive.

Why is neuroscience important for psychiatrists?

Mental health symptoms must come from the brain. I don't see where else they could come from, so I think neuroscience is indispensable for psychiatry. Neuroscience offers a major opportunity for psychiatry to leverage some of the advances in research and potentially find some ways of working that could benefit patients and create momentum in the field as a whole. One of the things that worries me about psychiatry now is what is going to happen to the specialty over the next 20—30 years. It worries me that to the next generation of talented young people, psychiatry might not look as attractive as oncology, or immunology, or other fields of medicine where there has been faster progress.

I think that psychiatry should be attractive to the best and brightest; and one of the things that the Royal College of Psychiatrists has done, and I am very supportive of, is the efforts at curriculum reform, trying to get more neuroscience in the curriculum. This has been very well received by the profession as a whole, but personally I think there is still more that we could do, including in building more neuroscience into Child and Adolescent psychiatry training. It will be a multi-generational challenge. It's not going to be people of my vintage who will complete the transition of psychiatry to a more neuroscience-focused discipline. We should be making psychiatry more attractive to able young people interested in neuroscience, who then will be able to carry this mission forward.

How can clinicians take steps to enhance their understanding of neuroscience?

I think that in the next 10 years, neuroscience and mental health will come together in a way they are not at the moment. First of all, I would recommend tuning into what the Royal College of Psychiatrists are offering in terms of neuroscience training. There is a lot of material presented from the perspective of a clinical trainee, and that's important, because if you just dive into the neuroscience literature, you might get lost. I would start with teaching aids generated as part of the curriculum reform, which make neuroscience more directly relevant to psychiatric issues.

We should also try to bring people together physically, for psychiatry trainees to easily pick up neuroscience. For trainees in Cambridge, there are an awful lot of local neuroscience seminars, talks and meetings. We have many neuroscience-based research projects that are ongoing, many of which will benefit from trainees getting involved. There are plenty of opportunities, and I hope there will be even more in the future.

What is the biggest challenge in psychiatric neuroscience today?

The big challenge is making it relevant to real life. There are all sorts of technical and scientific challenges that the scientific community are working away on, with good progress. But the big challenge for me is to translate this progress to the clinic. For example, who cares, clinically, about imaging? What is the relevance of imaging to current psychiatric clinical practice? It's zero. Sometimes we might do a structural scan to exclude a tumour. But most psychiatrists are not using brain imaging at all to support clinical decision making. You could point at multiple other examples, such as genetics. Many years of work on a

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massive international scale and we now have genes for schizophrenia, major depressive disorder, etc. But what difference has it made to the conduct of a mental health clinic in 2019? None.

These advances should be getting to the point now where they are good enough to be translated into practice and make a difference. On the imaging side, I'm part of a European imaging consortium which is collecting imaging data in multiple countries in a standardised way and analysing it using artificial intelligence to predict outcomes in first episode psychosis cases. The whole study has been set up so that the ultimate outcome is not just a paper, but a platform, a piece of infrastructure, which in future will support the clinician, sitting in a clinic with a 22-year-old who has just recovered from a first episode of psychosis, in predicting whether the episode is preceding progressive decline, or if it's just a blip and there will be a return to normal function. I think we could be looking at using automated computerised diagnosis of scans in 3 to 5 years.

Other areas where I would like to see change are the split between physical and mental health delivery systems and training. From the point of view of most patients, this is at least inconvenient, maybe more serious. The life expectancy of people with serious mental illness (SMI) is 10–15 years shorter than that of the general population, that is, SMI is as lethal as cancer. What are we doing about that? Could this be helped by changing the way services are delivered? Or how nurses and doctors are trained?

What is the biggest breakthrough in neuroscience you have seen over the course of your career?

It's difficult to pick out one. The discovery of genes for psychiatric disorders is a great breakthrough which has not yet been fully worked out in terms of its implications. And although it's not yet carried over to the clinic, brain imaging has seen great progress. It's easy to take it for granted, but when I was a medical student, imaging techniques were very primitive. Seeing the living human brain at the level of detail that we can now is a massive advance.

I'm very interested in the interface between the nervous system and the immune system, a science called neuroimmunology, which has come out of nowhere and did not exist when I was at medical school. At the time there was no hint that the brain could have anything to do with the immune system because of the blood brain barrier, and the brain was supposed to be immune privileged, how could it have had anything to do with the peripheral immune system? We know now that this was all incomplete, to put it politely, and that there are multiple channels of communication between the immune system and the brain and this opens up new ways of thinking about the relationship between physical and mental health. It also raises the possibility of entirely new treatment options for mental health disorders.

We talked about interactions between the immune system and the brain. You lead the BioDep study, which is immune-phenotyping people with serious mental illness. How far do you think we are from immune-based therapeutics for mental health disorders?

We could be quite close in the particular area of co-morbid depression. You are much more likely to be depressed if you have a medical inflammatory disorder such as arthritis or inflammatory bowel disease. All these patients can have depressive symptoms. We don't treat them well, we call it co-morbid depression, and very often they don't get treated for their mental health problem. It's likely that most of these symptoms are caused by inflammation and therefore could be directly treated by anti-inflammatory treatments. Meta-analyses of mental health measures taken as part of clinical trials of drugs tested for medical conditions such as arthritis show a pretty robust anti-depressive effect of anti-inflammatory treatments. I think the use of anti-inflammatory medication in so-called co-morbid depression could

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happen within a few years. Then there is the question of new anti-inflammatory treatments for patients with major depressive disorder. That is a slightly longer path, maybe 5 to 10 years down the line.

For some years you had a part-time involvement with GlaxoSmithKline. What are the benefits for clinicians of engaging with pharmaceutical companies?

I really enjoyed my time with industry, and I would recommend people to be open-minded about opportunities to see what's happening in industry, as well as what's happening in the NHS and in universities.

The benefits are mutual. Clinicians bring a great benefit to industry through their deep experience with patients. It is easy for companies to become isolated and inward-looking and forget that they are developing something that is intended to benefit real patients. So, it can be extremely valuable to involve people in drug development who have actually met patients with the condition.

And how does an experience in pharma benefit an academic?

Well, I learnt a lot at GSK. Many researchers are interested in learning and I believe I learned a lot of things that I would not have done if I'd stayed in academia. Something that's different about industry is that it tends to value breadth, while academia tends to value depth. In academia, typically you become an expert in a particular area and you tend to become the world expert in something incredibly narrow, and it's actually quite difficult to break out of that. In industry, people are expected to roam quite widely through a range of different areas. When I was with GSK, I was often involved in discussions about research in non-psychiatric treatment discovery, such as cholestasis, pain or obesity. A lot of people in industry change their job descriptions over the years, as careers in industry are more about solving the issues of drug development, which can be quite generic.

The other thing that industry taught me was on the organisational side. When I started with GSK in 2005 and I went to my first meeting, there were two words that were used over and over: one was 'leadership', the other was 'process'. I believe there are now more opportunities to develop leadership in the public sector; however, in terms of operational planning, such as deciding how you are going to analyse the data before starting, or how you are going to manage recruitment in order to complete a study on time, or manage budgets, all this is much, much stronger in industry than in academia. This is despite the fact that in the academic world large trials in experimental medicine and international collaborative efforts increasingly need these capabilities too.

Lastly, people often comment on the fact that scientists tend to talk a lot about success despite the fact that science frequently ends in failure. What's your view of success and failure?

Well, I've had lots of grant applications that failed, and lots of jobs that I did not get. I'm lucky that I have a very nice job, but I have not always succeeded, and I don't know anyone who has. A degree of failure goes with the territory. You have to try and remind yourself what your motivation is. What is it that you really want to do?

When you have a setback, it's very important to reflect on what you can learn from that, and some of that learning can be uncomfortable. Ultimately, everyone tries to do their best, but you cannot ignore that there is a big chunk of luck in all this, therefore one should not see failure as a catastrophe.

Professor Bullmore, thank you very much for your time today.



Survey

Can you help?

We are running a survey to collate your views and feedback on your experience of Trainees Online (TrOn), RCPsych's eLearning site that supports trainee psychiatrists in preparing for MRCPsych exams. Whether or not you have used TrOn, please take a moment to complete the survey as we consider TrOn's future and the possible development of modules covering Clinical Topics for Paper B of the MRCPsych exam. We are very grateful for your feedback.

TAKE THE SURVEY



2020 will see a flurry of **Brain Camps!** These popular concept workshops will be on the road once again across the UK. Confirmed dates so far:

- 7th May Brighton
- 18th May Exeter

Contact us for details:

Neuroscienceproject@rcpsych.ac.uk

Events and Opportunities

Booking is **NOW OPEN** for the 2020 RCPsych Neuroscience Spring Conference!

Based on previous years, there is sure to be a high demand for places! To guarantee yours, [book online](#) now. Enquiries to Emma.George@rcpsych.ac.uk



Speakers:

Professor Ian Jones (Cardiff) *Mood disorders in childbirth*

Professor Amanda Kirby (South Wales) *Trans-generational influence of life experiences*

Professor Emily Jones (Birkbeck) *Autism: Basic mechanisms and treatment targets*

Professor Naomi Fineberg (Hertfordshire) *OCD: Neuropsychopharmacological basis*

Dr David Okai (SLAM/KCL) *Parkinson's Disease: Neuropsychiatric aspects*

Dr Ivan Koychev (Oxford) *Alzheimer's: Biomarkers for disease progression*

Information: Neuroscienceproject@rcpsych.ac.uk



Supported by the Gatsby Charitable Foundation and the Wellcome Trust



NEW! NEW! NEW!

A brand-new event for Scotland!

'**Scottish Neuroscience in Psychiatry**' (**SNiP2020**) will be a whole-day conference at the University of Stirling on **Thursday 21 May 2020**.

This unique event is a not-to-be-missed opportunity to engage with clinically-relevant, cutting-edge neuroscience research. The conference will provide an essential update to all psychiatric consultants, trainers, trainees and others with an interest in the rapid advances being made in understanding the biological basis of psychiatric disorders. Registration fees represent an excellent investment in your professional development: Standard rate £45 Reduced rate £25. **Places are limited to 200.**

Provisional Programme

Host: Professor John Crichton, Chair, RCPsych in Scotland and Vice-President, RCPsych

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Events and Opportunities

Chairs: Professor Jonathan Cavanagh (Glasgow) and Professor Stephen Lawrie (Edinburgh)

Speakers include:

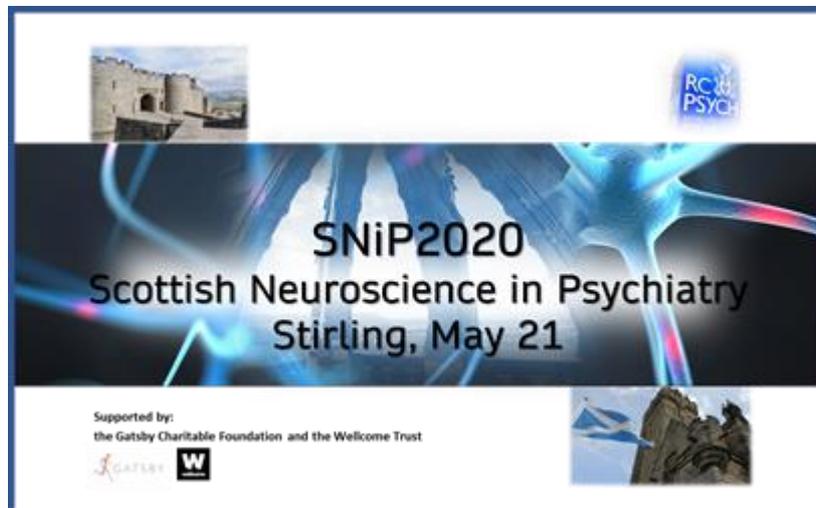
- Dr Mandy Johnstone (Edinburgh/King's College London) *Brain organoids in the investigation of psychiatric disorders*
- Professor Seth Grant (Edinburgh) *Cellular mechanisms underlying psychiatric disorders*
- Dr John Goodfellow (Glasgow) *Neuroinflammation*
- Dr Rajeev Krishnadas (Glasgow) *Brain functional connectivity*
- Professor Andrew McIntosh (Edinburgh) *Genetics and genomics of schizophrenia*

***Special session on teaching of neuroscience with RCPsych Gatsby/Wellcome Neuroscience Project

*****Poster session**

To guarantee your place, [book online](#) now.

Enquiries to Susan.Richardson@rcpsych.ac.uk or Neuroscienceproject@rcpsych.ac.uk



Get Involved!

Want to advertise your event? Or publish an article? Contact us at Neuroscienceproject@rcpsych.ac.uk. **Please put 'PSynapse' in the subject line.**

Curious about what's going on in your region? Want to get involved, or organise an event? Contact your local **RCPsych Neuroscience Champion** to talk all things Neuroscience!

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Who We Are

The **Royal College of Psychiatrists** (RCPsych) is running a **5-year programme** to transform psychiatric training in the UK by integrating modern neuroscience, with generous support from **The Gatsby Foundation** and **The Wellcome Trust**. Our aim is that future psychiatrists will incorporate a modern neuroscience perspective into every formulation. We have evolved and invigorated psychiatric Core Training in the UK. A comprehensive programme of activities is proactively supporting excellent neuroscience teaching for trainee psychiatrists.



rcpsych.ac.uk/training/neuroscience-in-training

#GWNeuro

PSynapse is a way for you keep in touch with Neuroscience – the latest developments in cutting-edge research, the thoughts of leading researchers and clinicians, news and opportunities.

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