

chronic pain and to more accurate clinical trials for effective analgesics by eliminating people with a high placebo response before the trials.

Tétreault, P., Mansour, A., Vachon-Présseau, E., *et al* (2016) Brain connectivity predicts placebo response across chronic pain clinical trials. *PLoS Biology*. Published online 27 October 2016 (<https://doi.org/10.1371/journal.pbio.1002570>).

### ***Early diagnosis of Alzheimer's disease – is the retina a window to brain pathology?***

As dementia is catching up with cardiovascular disorders as the leading cause of disability, the pressure for early diagnosis and early intervention is increasing. Researchers from the University of Texas, USA, had previously shown that a toxic form of tau protein might underlie the early stages of Alzheimer's disease. Tau protein is needed by brain cells to receive nutrients and get rid of waste. In Alzheimer's disease it changes into a toxic form called tau oligomers that clump together to form neurofibrillary tangles. These prevent the movement of molecular nutrients and so result in neuronal toxicity and brain cell death.

They also found that the tau oligomers may induce inflammation in Alzheimer's disease, and spreading between connected brain regions may initiate inflammation in these regions, creating a vicious cycle of toxic tau, inflammation and cell death throughout the brain over time. Inflammation and loss of connections between nerves within the brain happen before the formation of the tangles that are characteristic of this disease and it is possible that the tau oligomers may be responsible for this inflammation.

The researchers now have also found that tau oligomers are present in the retina and are associated with inflammatory cells, which suggests that the retina may be a valid and non-invasive biomarker for brain pathology in Alzheimer's disease.

So brush up on your ophthalmoscopy skills and get started!

Nilson, A. N., English, K. C., Gerson, J. E., *et al* (2016) Tau oligomers associate with inflammation in the brain and retina of tauopathy mice and in neurodegenerative diseases. *Journal of Alzheimer's Disease*. Published online 12 September 2016 (<https://doi.org/10.3233/JAD-160912>).

### ***'Birdbrain' an insult? Not any more!***

Small brains don't always mean less cognitive ability! Many birds' cognitive abilities match or surpass those of mammals. Corvids and parrots rival great apes in many psychological domains. They manufacture and use tools, solve problems, make inferences about causal mechanisms, recognise themselves in a mirror, plan for future needs and use their own experience to anticipate the behaviour of conspecifics or even humans; these are only a few of their abilities!

Researchers from Charles University of Prague, the University of Vienna and University of Rio de Janeiro used the 'isotropic fractionator' to determine the numbers of neurons in specific brain regions. They found that parrots and corvids have forebrain neuron counts equal to or greater than primates with much larger brains and they suggest that this high neuron count substantially contributes to the neural basis of avian intelligence.

Olkowicz, S., Kocourek, M., Radek, K., *et al* (2016) Birds have primate-like numbers of neurons in the forebrain. *PNAS*, 113 (26), 7255–7260.

### ***The gene for good sleep and happiness***

As psychiatrists we are well aware of the close relationship between sleep and mood. Now we know there is a molecular genetic basis to this, at least as far as seasonality is concerned.

In a study of the genetics of a family with both seasonal affective disorder (SAD) and familial advanced sleep-phase syndrome (FASP) researchers identified two rare variants of the circadian clock gene PERIOD3 (PER3). These variants destabilised PER3 and failed to stabilise PERIOD1/2 proteins, which are of critical importance to circadian timing. Mice lacking PER3 showed consistent depression-like behaviour, particularly when studied under a short photo-period. The authors suggest PER3 may be the connection between sleep and mood regulation and their fine-tuning to enable them to adapt to seasonal changes.

Zhang, L., Hirano, A., Hsu, P.-K., *et al* (2016) A PERIOD3 variant causes a circadian phenotype and is associated with a seasonal mood trait. *PNAS*, 113, E1536–E1544 (<https://doi.org/10.1073/pnas.1600039113>).

## **International Perspectives on Psychiatry in Restrictive Environments or under Restrictive Conditions**

*BJPsych International* is seeking to survey across the world the practice of psychiatry in restrictive settings and conditions (prisons, jails, on parole, conditional release and community treatment under legal provision) as well as coercive practices in the management of people with a mental illness, beyond psychiatry. The journal, therefore, is inviting authors to submit papers on national or regional aspects of one or more of the above areas, highlighting current practice, relevant data (or lack of the same), training and service needs and areas for future research. For further information, please contact the deputy editor, George Ikkos, at [ipgi@rcpsych.ac.uk](mailto:ipgi@rcpsych.ac.uk)