

## IN THE NEWS

## Retail therapy

Many people use shopping as a way to cheer themselves up, but for compulsive shoppers it can cause profound misery, not to mention serious financial problems. However, thanks to a team at Stanford University in California, a solution might be at hand.

The researchers, led by Lorin Koran, recruited 24 compulsive shoppers to their study. According to *BBC News Online* (18 July) "one had bought more than 2000 wrenches, another owned 55 cameras". The patients were treated with the antidepressant citalopram (Celexa) for seven weeks, followed by the drug or a placebo for a further nine weeks.

All of the patients who took citalopram for the entire course of the experiment reported that they had lost interest in shopping. Koran is reported as saying "Patients said to me: 'I go to the shopping mall with my friends and I don't buy anything. I can't believe it and they can't believe it'" (*BBC News Online*). By contrast, five of the eight patients in the placebo group relapsed after the drug was withdrawn. It is not yet known why citalopram is effective for treating compulsive shoppers, but Koran suggests that it might work by altering serotonin levels in the brain.

Although these initial findings are encouraging, the treatment has its drawbacks. As *NBC11 News* (16 July) reports, "Celexa does have some side effects, which include loss of sexual desire and sleepiness". Also, some experts have questioned the fundamental concept of using drugs to treat compulsive behaviour. Robert Lefever from the PROMIS Recovery Centre in Kent (UK) says "of course antidepressants help the disorder, in the same way they would help alcohol dependency. They are simply another addiction. It's the same relation as methadone to heroin" (*BBC News Online*).

Heather Wood

## PSYCHIATRIC DISORDERS

## Patterns of pathology

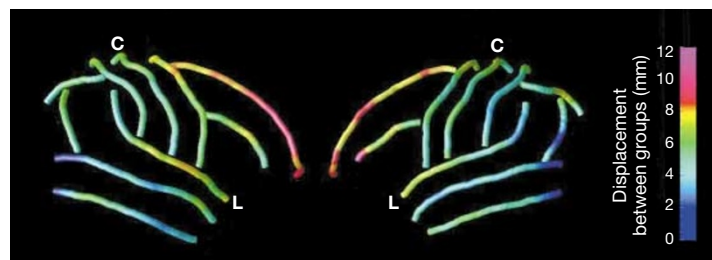
Neuroanatomical abnormalities that accompany autism include widespread deviations in cortical surface anatomy, a new study published in *Cerebral Cortex* indicates. Examining the differences between autistic and normal subjects in the pattern of cortical gyri and sulci could provide

clues to the developmental pathology of the disorder.

Previous studies have described limbic and cerebellar pathology in autism, and evidence is accumulating for an involvement of neocortical regions. However, there is no clear consensus on the neural basis of this

condition. In an attempt to home in on affected areas of the cortex, Levitt and co-workers carried out the first three-dimensional mapping of cortical sulcal patterns in autistic disorder.

Using MRI (magnetic resonance imaging) scans of the brains of autistic and normal children, Levitt *et al.* generated a high-resolution model of the cortex for each subject, and built average sulcal maps for the two groups. A comparison of these maps revealed displacements of several major sulci in patients with autism, primarily in frontal and temporal regions. For example, anterior and superior shifting of the superior frontal sulcus was detected bilaterally, and the left and right superior temporal sulci,



Three-dimensional variability in cortical sulci between the patient and control groups. C, central sulcus; L, lateral sulcus. Courtesy of Jennifer G. Levitt, University of California, Los Angeles.

## SYNAPTIC PLASTICITY

## Retro styling

It is easy to think of synaptic communication as one-way traffic, but in many cases, postsynaptic cells can also signal back to the presynaptic neuron to regulate synapse structure and function. The *Drosophila* neuromuscular junction (NMJ) illustrates how retrograde signalling contributes to synapse homeostasis, and two studies reported in *Neuron* identify new components of the signalling mechanism.

In the *Drosophila* embryo, motor neurons compensate for the growth of their target muscles by making extra synaptic boutons and by raising the number of neurotransmitter release sites at each synapse. These events rely on bone morphogenetic protein (BMP) signalling through the Wishful thinking (Wit) receptor on the presynaptic terminal. Until now, the Wit ligand that is released by the postsynaptic muscle cell was unknown. McCabe *et al.* knocked out the *glass bottom boat*

(*gbb*) gene, which codes for a BMP homologue. This manipulation produced a phenocopy of the Wit-knockout phenotype, which is characterized by reductions in NMJ size and activity, and defects in synaptic ultrastructure. *In vitro* studies confirmed that Gbb acts as a ligand for Wit. These findings point towards a role for Gbb in controlling the growth of the NMJ.

In the second study, Haghighi *et al.* investigated the modulation of neurotransmission by retrograde signalling. They found that reducing  $Ca^{2+}$ /calmodulin-dependent kinase II (CaMKII) activity in the postsynaptic muscle cell led to an increase in neurotransmitter release from the presynaptic neuron. Conversely, activating CaMKII constitutively in the muscle cell reduced the level of synaptic transmission. The authors propose that CaMKII senses the level of synaptic activity by monitoring  $Ca^{2+}$  levels. Synaptic activity causes an influx of  $Ca^{2+}$

into the muscle. This activates CaMKII, which in turn triggers a retrograde signal that inhibits neurotransmitter release from the presynaptic terminal. Once again, a BMP signal seems to be responsible, but it is not yet known whether Gbb is involved.

A third study by Pratt *et al.*, which was also reported in *Neuron*, showed that postsynaptic CaMKII also mediates synapse remodelling in the mammalian brain. This indicates that at least some of the *Drosophila* retrograde signalling machinery has been conserved during evolution, and it seems likely that further examination of the *Drosophila* NMJ will bring to light more aspects of retrograde signalling that apply across the animal kingdom.

Heather Wood

## References and links

- ORIGINAL RESEARCH PAPERS** McCabe, B. *et al.* The BMP homologue Gbb provides a retrograde signal that regulates synaptic growth at the *Drosophila* neuromuscular junction. *Neuron* **39**, 241–254 (2003) | Haghighi, A. J. *et al.* Retrograde control of synaptic transmission by postsynaptic CaMKII at the *Drosophila* neuromuscular junction. *Neuron* **39**, 255–267 (2003) | **FURTHER READING** Pratt, K. G. *et al.* Activity-dependent remodeling of presynaptic inputs by postsynaptic expression of activated CaMKII. *Neuron* **39**, 269–281 (2003)