

IN BRIEF

SYNAPTIC TRANSMISSION**Taking back what you owe**

Exocytosis of synaptic vesicles is balanced by endocytosis, but the mechanisms of this process are incompletely understood. The authors measured membrane capacitance to detect decreases in surface area at presynaptic boutons (indicating membrane retrieval by endocytosis). In hippocampal and cerebellar neurons, endocytosis following a single action potential was fast and clathrin-independent; it was also faster at physiological than at lower temperatures. By contrast, trains of action potentials resulted in slower, clathrin-independent endocytosis; thus, different patterns of neuronal activity result in distinct modes of endocytosis.

ORIGINAL ARTICLE Delvendahl, I. *et al.* Fast, temperature-sensitive and clathrin-independent endocytosis at central synapses. *Neuron* **90**, <http://dx.doi.org/10.1016/j.neuron.2016.03.013> (2016)

COGNITIVE NEUROSCIENCE**Getting over yourself**

Lysergic acid diethylamide (LSD) effects have not been studied using modern brain-imaging techniques. Two recent studies investigated brain activity and functional connectivity under the influence of LSD. Tagliazucchi *et al.* used functional MRI (fMRI) to monitor changes in intrinsic functional connectivity following intravenous administration of LSD. They found that LSD administration resulted in a global increase in functional connectivity. These included the default-mode network (DMN) and the salience network, which are associated with a sense of self, and thus the functional connectivity changes could be relevant to the reduced sense of identity (that is, ego dissolution) that is reported by individuals who take LSD. In the second study, Carhart-Harris *et al.* used arterial spin labelling, blood oxygen level-dependent (BOLD) measurements and magnetoencephalopathy (MEG) to investigate brain changes induced by LSD. LSD administration increased functional connectivity in visual cortex (compared with a placebo), and this increase was correlated with visual hallucinations. Decreases in connectivity between parahippocampal regions and the retrosplenial cortex were strongly correlated with ratings of ego dissolution. Together, these data reveal patterns of activity that could underlie some of the perceived psychological effects reported by those who take the drug.

ORIGINAL ARTICLES Tagliazucchi, E. *et al.* Increased global functional connectivity correlates with LSD-induced ego dissolution. *Curr. Biol.* <http://dx.doi.org/10.1016/j.cub.2016.02.010> (2016) | Carhart-Harris, R. L. *et al.* Neural correlates of the LSD experience revealed by multimodal neuroimaging. *Proc. Natl Acad. Sci. USA* <http://dx.doi.org/10.1073/pnas.1518377113> (2016)

SYSTEMS NEUROSCIENCE**Neural bypass**

Intracortical activity patterns have previously been used to control neuroprosthetic robotic devices, but it has not yet been possible to use these signals to drive contraction of muscles in the paralysed limb. Here, activity in the motor cortex of a person with quadriplegia was recorded by an intracortical electrode microarray, decoded and used to drive activation of the person's forearm muscles using a high-resolution neuromuscular stimulation system. After 15 months of training, this 'neural bypass' system allowed the participant to complete grasp, pour and stir movements in real time.

ORIGINAL ARTICLE Bouton, C. E. *et al.* Restoring cortical control of functional movement in a human with quadriplegia. *Nature* <http://dx.doi.org/10.1038/nature17435> (2016)