IN THE NEWS

Epileptogenesis

A recent survey carried out by the UK National Society for Epilepsy (NSE) has uncovered an alarming gap in the public's knowledge about epilepsy. "There is still widespread ignorance about this condition. Our members often face negative, old-fashioned attitudes" reports Philip Lee (*Epilepsy Action News*, UK, 19 May 2003).

The aim of the survey was to ascertain the level of public understanding of epilepsy and of how to recognize and respond appropriately to someone having a seizure, and to clear up some of the misconceptions that surround the condition.

Most people would recognize someone having a seizure if they fell to the ground and shook uncontrollably. However, less known are 'absence seizures', whereby the person simply looks blank. The recognition of this form of seizure is particularly important in schools to ensure that students are treated for the condition, rather than being regarded as a 'day dreamer'.

More than a quarter of people surveyed would try to restrain someone having a seizure, and almost a third would put something in their mouth. "Both actions are outdated, inappropriate, potentially dangerous and should be avoided" (*National Society for Epilepsy*, UK, 19 May 2003). Your best bet is to protect the person's head with something soft, and don't put your fingers in their mouth or you might get a surprise.

Worryingly, the survey discovered that 2% of people believe epilepsy is caused by possession by evil spirits (*BBC News Online*, UK, 18 May 2003) and that a similar percentage wrongly believe that they can catch the condition by touching someone who has it.

The survey's findings confirm the need for ongoing public education about epilepsy. Accordingly, the NSE has launched a 'Get it Right' campaign to encourage greater awareness.

Emma Green

MOTOR SYSTEMS

Timely movements

Before we execute a given motor act, certain preparatory neural activity is thought to take place in areas that interact with the motor cortex. What are the characteristics of this activity and where does it occur? The basal ganglia — subcortical structures that are reciprocally connected with the motor cortex — have been a favourite focus of attention in relation to this question. Now, reporting in *Journal of Neurophysiology*, Lee and Assad studied the preparatory activity in the posterior putamen, comparing it during cued and self-initiated movements.

Using an elegant experimental design, the authors trained monkeys to guide a spot of light using a joystick under two different conditions. In some trials, they presented a visual cue that signalled the moment in which the monkeys had to start the movement; in others (self-timed movements), no cue was presented, but the monkeys still had to wait for a couple of seconds before moving the joystick. Lee and Assad found that the movement-related activity of neurons in the posterior putamen was similar for cued and self-timed movements; in both cases there was a marked increase in firing shortly before movement generation. But in the case of self-timed actions, this increase built up slowly, starting about 600 ms before movement onset. By contrast, this build-up was absent in cued trials, and activity simply rose sharply after presentation of the cue. Interestingly, in cued trials, the level of activity immediately before cue presentation correlated with the reaction time of the monkeys. In other words, the reaction time was shortest in trials in which the level of activity before the cue was highest.

The authors propose that exceeding a threshold level of activity in basal ganglia circuits might be necessary for movement initiation. In the case of self-timed movements, this threshold is slowly reached as a result of the activity build-up, whereas in the case of cued movements, the abrupt increase triggered by the cue is sufficient to reach such a threshold.

It will be interesting to explore whether similar patterns of activity occur in other basal ganglia nuclei and in other premotor regions. Similarly, using the experimental design of Lee and Assad to revisit the preparatory activity of the anterior putamen, which shows significant differences to the findings reported in this paper, might prove quite informative.

Juan Carlos López

References and links

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DEVELOPMENT

miRNAs act on a hunch

The coordinated specification and deployment of cells in space and time is central to animal development. The *Drosophila hunchback* (*hb*) gene codes for a transcription factor that is well known for its role in the spatial patterning of the embryonic nervous system, and recently this factor has also been implicated in the temporal regulation of neuronal birth. This means that the activity of *hb* needs to be confined to a discrete time window. How is this achieved? According to two new reports in *Developmental Cell*, the *hunchback* homologue *hbl-1* in the worm *Caenhorhabditis elegans* might provide some vital clues.

Abrahante *et al.* and Lin *et al.* showed that loss of *hbl-1* function in the *C. elegans* larva causes certain cells, including the seam cells of the hypodermis, to acquire adult characteristics prematurely. This indicates that HBL-1 is involved in regulating the timing of the larva–adult transition. The teams also showed that HBL-1 protein expression is normally downregulated in the hypodermis and ventral nerve cord (VNC) during post-embryonic development.

The downregulation of HBL-1 depends on the presence of the 3' untranslated region (3'UTR) of the *hbl-1* gene. This region contains binding sites for microRNAs (miRNAs) — small non-coding RNAs that regulate gene expression at the post-transcriptional level. Abrahante *et al.* showed that a miRNA called *let-7* binds to the 3'UTR, and is required for the downregulation of HBL-1 in the VNC. Lin *et al.* provided additional support for this idea, and showed that another miRNA, *lin-4*, might also be required.

Could the expression of the *hb* gene product in *Drosophila* be regulated by miRNAs? Such a mechanism would certainly account for the rapid switching of transcription factor expression in neuroblasts, which controls the temporal sequence of neuronal specification in the *Drosophila* embryo. Also, the 3'UTR of the *hb* gene has been found to contain putative miRNA binding sites, so this possibility will definitely be worth exploring.

Heather Wood

References and links

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