Key Note

# Chapter 3: Mechanisms of early and middle visual processing

## Key note 3C: Differences between human and monkey V4

This note is a reminder that monkeys (on whom most electrophysiological experiments are done) are different from people (with whom most behavioural studies are done).

It is usually assumed that homologous areas of human and monkey brain have similar properties. This appears to be a safe assumption in general, but an example of a difference is provided by V4. In macaque monkey, V4 can be subdivided into two regions, ventral and dorsal V4 (V4v and V4d), which contain representations of the lower and upper visual fields, respectively. Although a similar distinction has been made for human V4, it appears that the dorsal and ventral regions of human V4, rather than encoding the same stimulus properties in retinotopic maps of different parts of the visual field, in fact encode different properties for the whole visual field. Thus, from fMRI studies, dorsal V4 (or the region dorsal to V4) is not markedly colour selective, but responds to motion-defined contours, whereas ventral V4 is colour selective (Tootell and Hadjikhani, 2001). Goddard et al. (2010) confirmed the colour selectivity of human V4v, and showed that it contained a retinotopic map of the whole visual field. Thus human V4 appears to be organised differently from macaque V4.

Tootell RBH, Hadjikhani N (2001) Where is ‘dorsal V4’ in human visual cortex? Retinotopic, topographic and functional evidence. *Cerebral Cortex* 11: 298–311.

Goddard E, Mannion DJ, McDonald JS, Solomon SG, Clifford CWG (2010) Color responsiveness argues against a dorsal component of human V4. *Journal of Vision* 11(4): 1–21.