
We have suggested that the visual scene is represented in inferior temporal (IT) cortex by the pattern of activity across a population of IT neurons each selective for some aspect or aspects of the visual stimulus (Gross et al., in Pattern Recognition Mechanisms, 1985). This view of IT cortex is similar to that postulated for the later stages of some contemporary models of pattern recognition. The purpose of this study was to obtain information about interactions among IT neurons that could help to constrain and develop such models.

We recorded IT activity from bundles of three microelectrodes. Multi-unit activity on each electrode was segregated into single unit activity with a spike sorting apparatus enabling us to study the simultaneous activity of up to nine isolated neurons. The monkey fixated a small spot while stimuli were presented extrafoveally.

Cross-correlation analysis demonstrated that some neuron pairs interact with some combination of shared excitatory input and direct synaptic connections, while other pairs show independent patterns of firing. Furthermore, neurons recorded on the same electrode were more likely to have functional connections and similar stimulus selectivity than neurons recorded on adjacent electrodes. These results will be discussed in relation to models of pattern recognition.