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Separating the wheat from the chaff. Physiological mechanism of attentional filtering in the primate brain

The primate nervous system is the result of an evolutionary process during which environmental factors have exerted selective pressures on brain structure and function favoring adaptations and mechanisms that make information processing efficient. One example is the cognitive mechanism of attention through which the brain selectively enhances the processing of behaviorally relevant signals while suppresses irrelevant ones. Attention is ubiquitous to many species, and likely evolved as a solution to a mismatch between the limited processing capacity of sensory and cognitive brain systems, and the overwhelming amount of signals entering the brain at any given moment. In this talk I will concentrate on the results of two main experiments addressing two main questions concerning the physiological mechanisms of attention. First, how attention modulates sensory processing in visual neurons within area MT of awake macaques, and second, how neurons in the prefrontal cortex of these animals enhance the processing of behaviourally relevant signals while suppress the processing of irrelevant ones.

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