



## 1. How are neural representations of objects altered by experience?

Individual neurons in primate temporal cortex are known to response to complex visual patterns. How does such selectivity arise? Previous studies suggest that visual receptive field properties of these cells may be altered by experience, even in mature animals. Tracking potential physiological changes over long periods, however, is difficult with single unit studies because of the inherent sampling limitations of the approach. Therefore, as a complement to these single cell studies, we have tracked the effects of visual exposure and recognition training on the neuronal response to sets of familiar and unfamiliar visual images in a series of chronic event related potential (ERP) experiments in two rhesus monkeys.

### **Experimental Questions**

Can we detect large scale changes in physiological response as a result of familiarity? How early following stimulus onset are such changes evident? Under what behavioral conditions do such effects appear? For how long do effects of familiarity persist?



## 2. Visual ERPs were recorded in monkeys during discrimination and fixation tasks

#### Recordings

Titanium skulls screws were implanted in two monkeys Signals were filtered between 0.1Hz and 300Hz, sampled at 2.5kHz Reference was frontal



<b>Behavioral Tasks</b>			
<b>Discrimination Task</b>	•		L R
	Fixate	Stimulus On	Respond
Viewing Task	•		
	Fixate	Stimulus On	Refixate
Stimulus Conditions			
Novel category	L R		
Novel exemplars	L R		
	Fa	miliar	Novel

# Changes in visual evoked potentials during visual discrimination learning K Kawasaki JJ Peissig DL Sheinberg Department of Neuroscience, Brown University, Providence, RI, USA

3. ERPs to images from novel object categories were consistently reduced compared to familiar category exemplars









## 5. Novel category exemplars revealed clear ERP differences



#### ...and again





...and again





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