

# Voluntary Movement II.

## Cortical representation of movements and parameters.

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### 1. Primary motor cortex: how are movement parameters coded

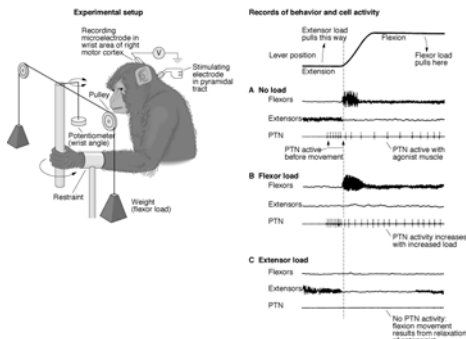
- Distal movements
- CM neurons.
- Population coding.

### 2. Premotor areas higher order features of movement

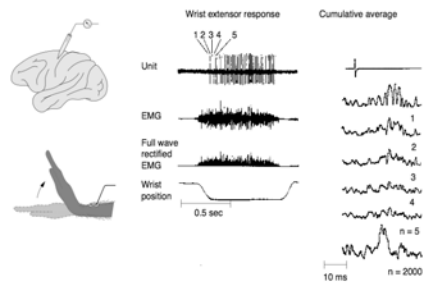
- Supplementary motor area: Sequences
- Lateral dorsal premotor area: sensorimotor transformations
- Lateral ventral premotor area: grasping

### 3. Experience modifies representations

### Corticospinal neurons (PTN) code direction and force



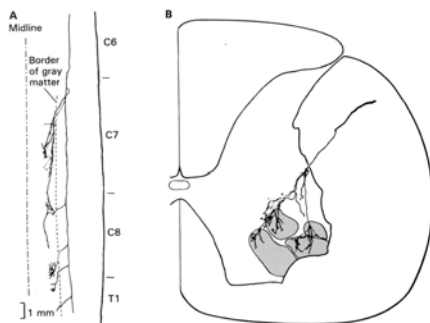
### Target muscles can be identified by "spike triggered averaging" CM neurons: divergence



CM neurons to distal muscles have small "muscle fields" (1-4 muscles)

CM neurons to proximal muscles have large (6+) "muscle fields"

### Single corticospinal axons diverge to terminate in several motor nuclei



### CM neurons code for force exerted

