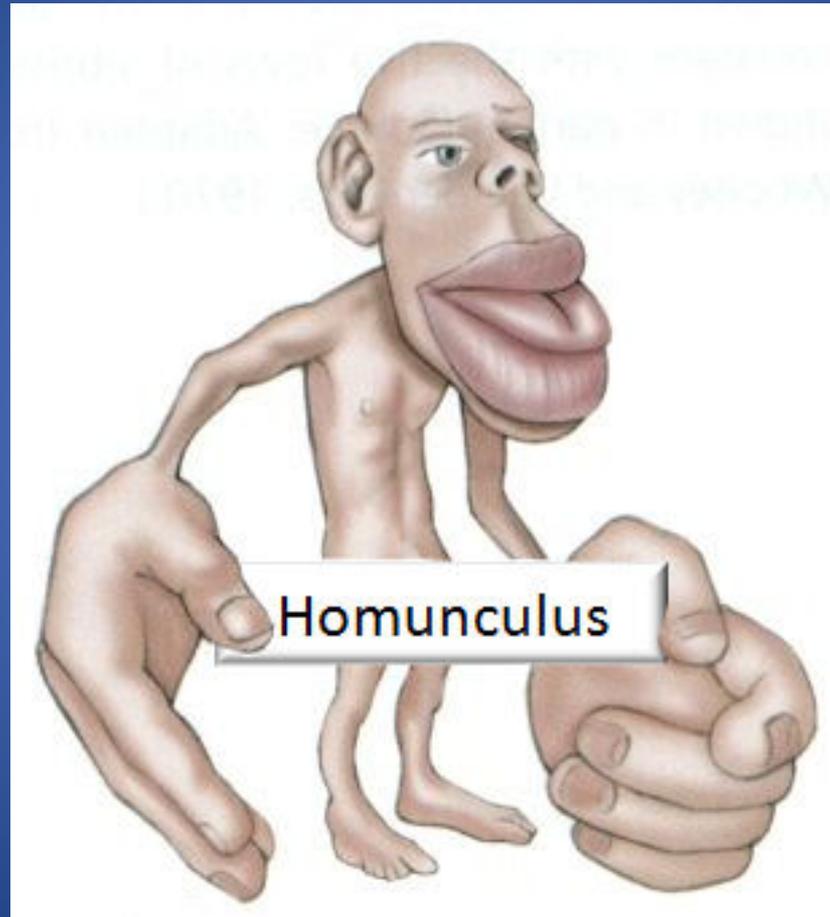


Brain Sensory Maps

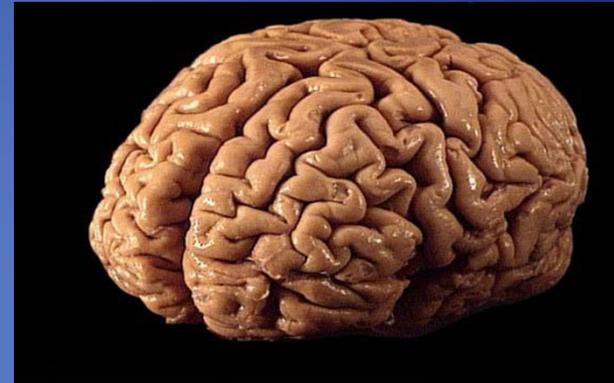


Brain Initiative

Announced April 3, 2013

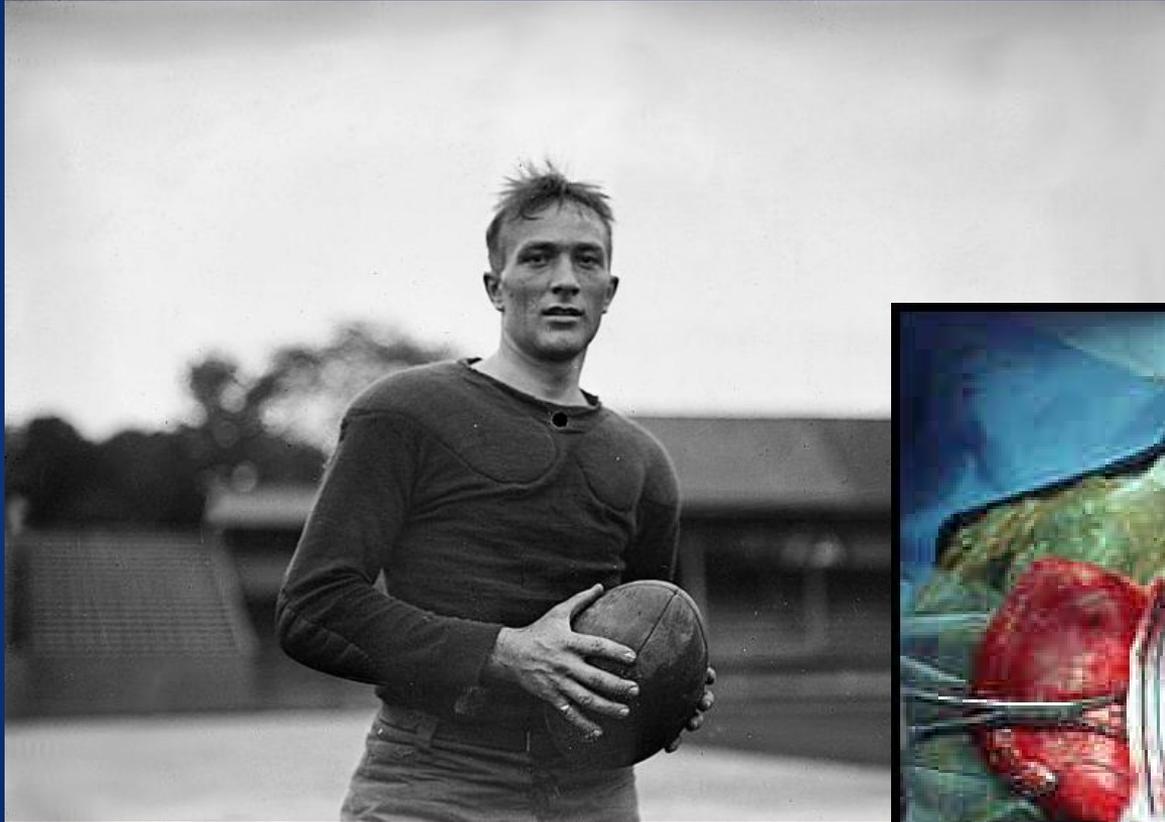
The Human Connectome Project

Finding how 100 billion neurons make 100 trillion connections.

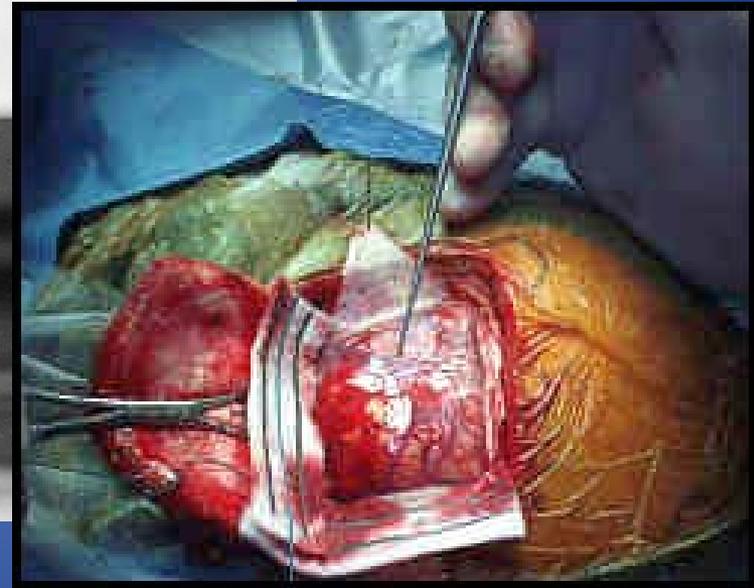


<http://www.whitehouse.gov/share/brain-initiative>

Wilder Penfield



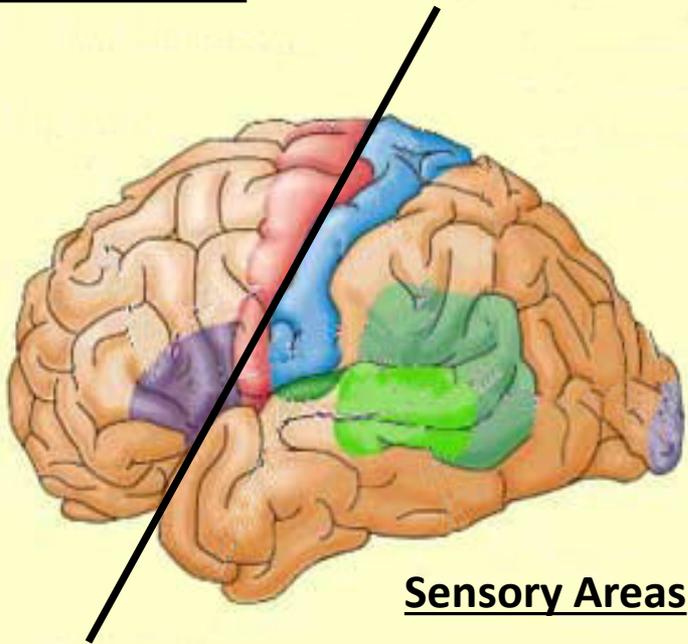
Neurosurgeon



Brain stimulation

Brain Mapping

Motor Areas

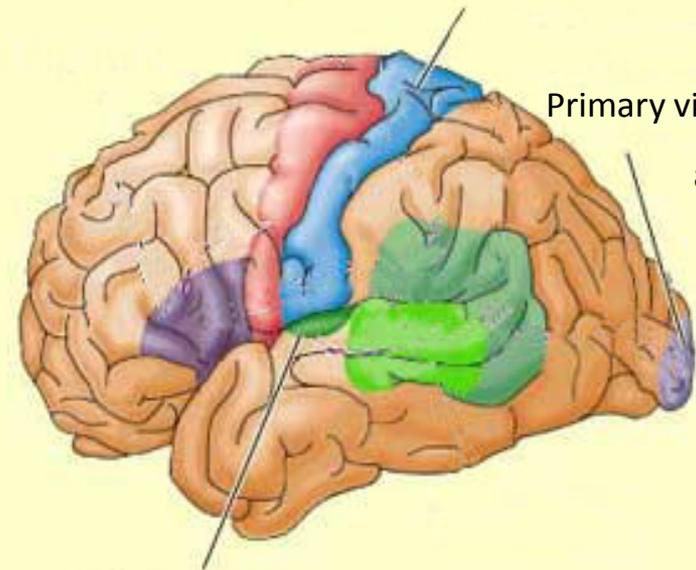


Sensory Areas

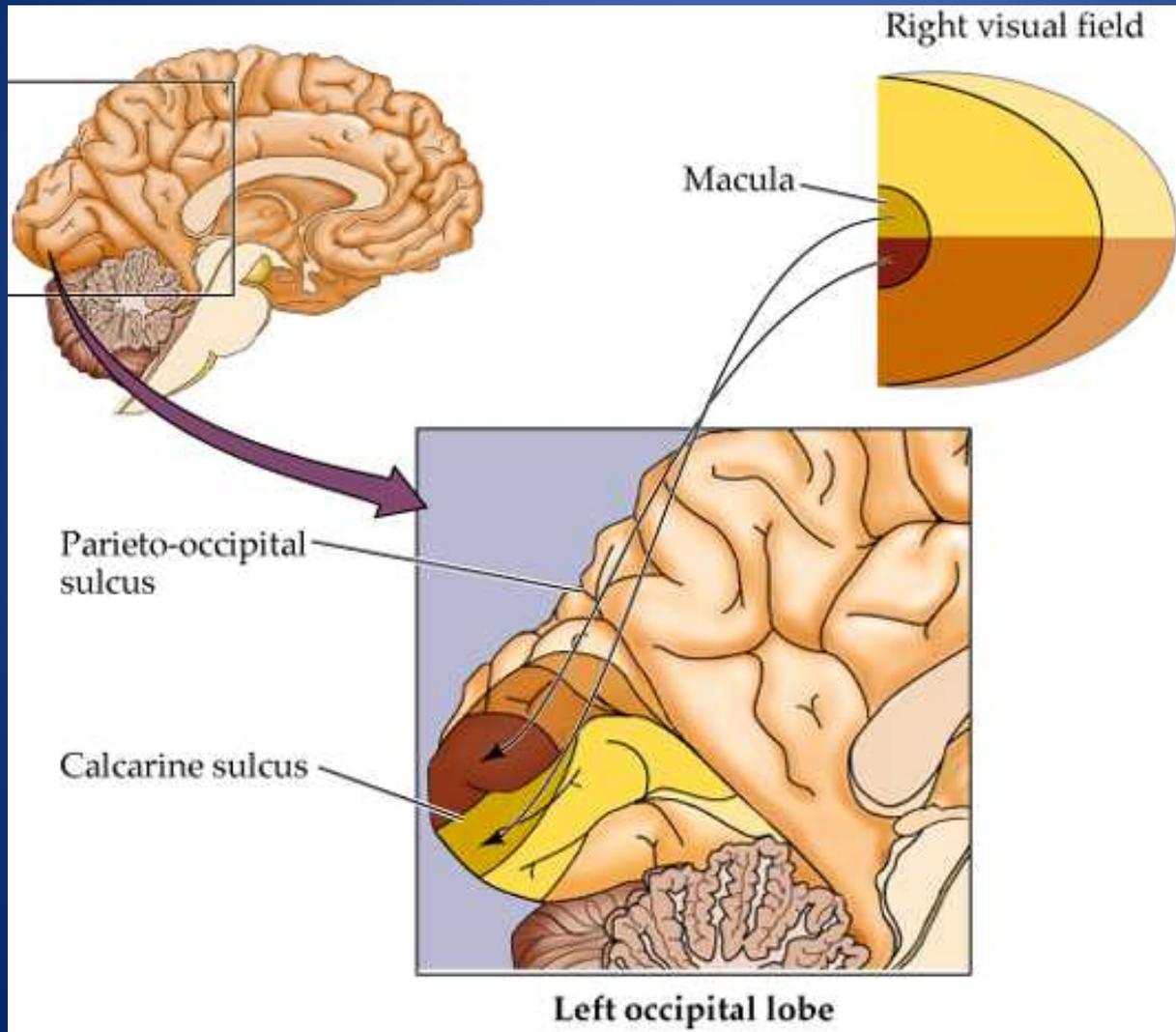
Primary somatosensory area

Primary visual area

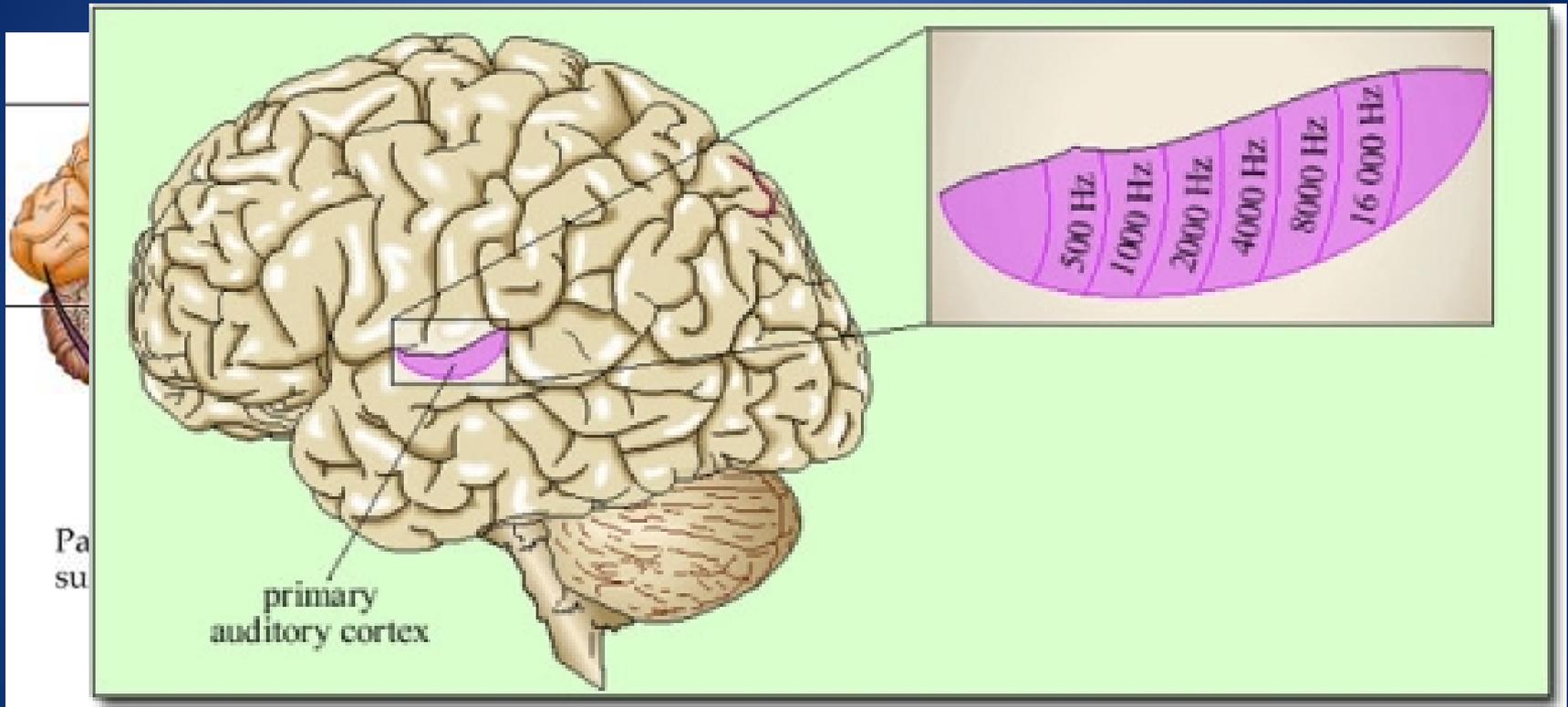
Primary auditory area



Brain Mapping



Brain Mapping



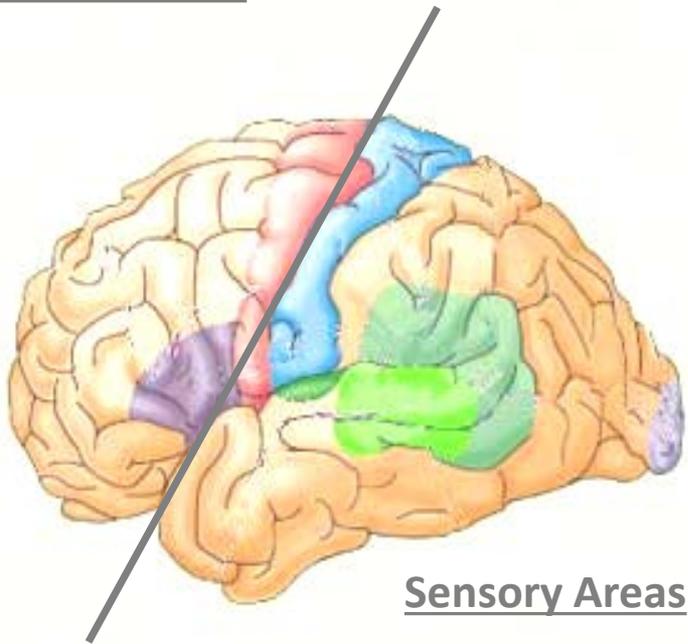
Calcarine sulcus



Left occipital lobe

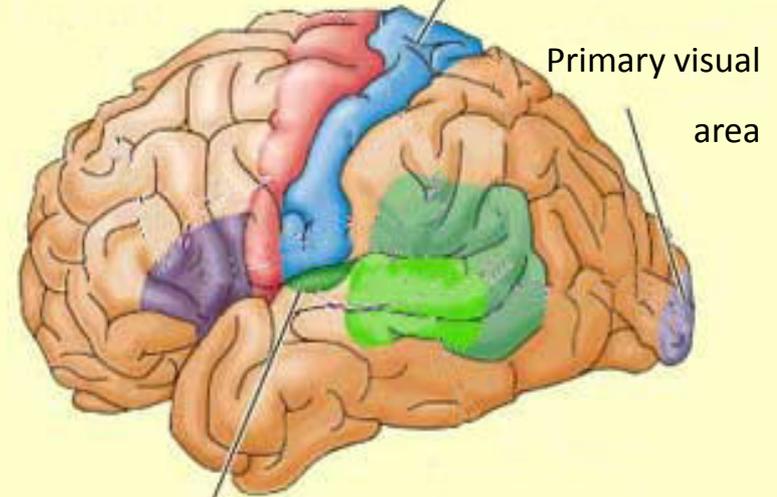
Brain Mapping

Motor Areas



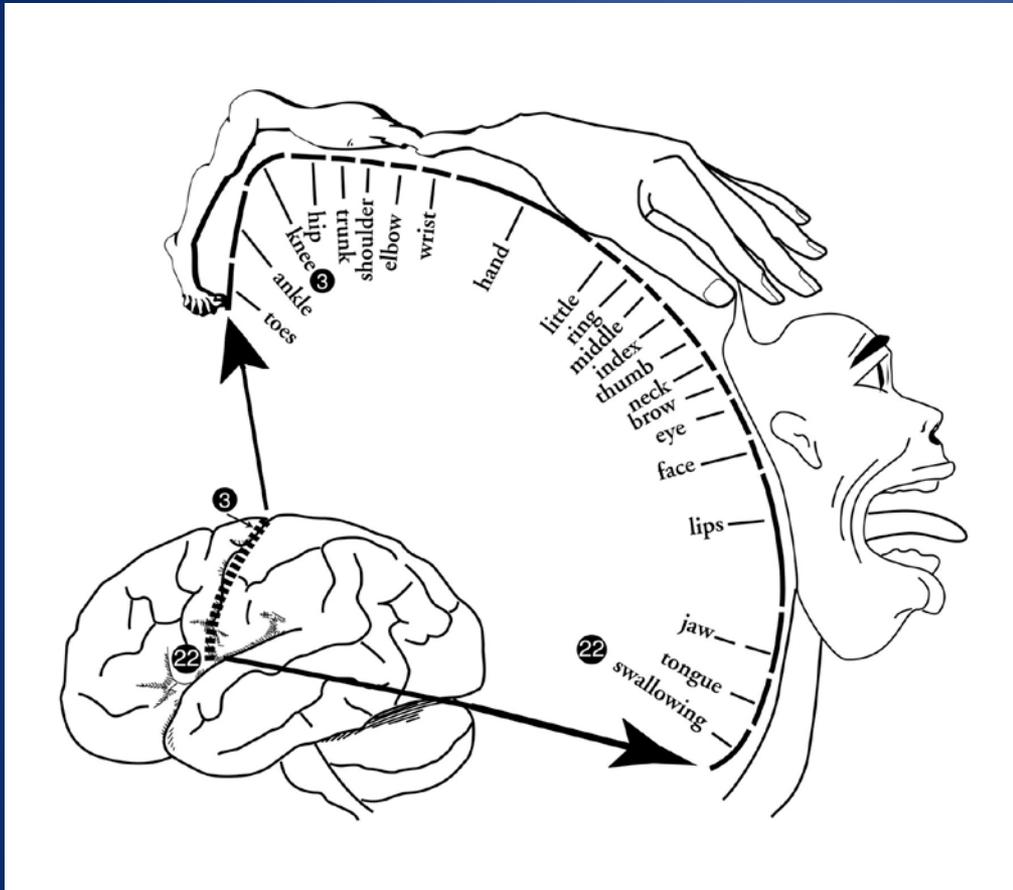
Sensory Areas

Primary somatosensory area



Primary visual area

Primary auditory area

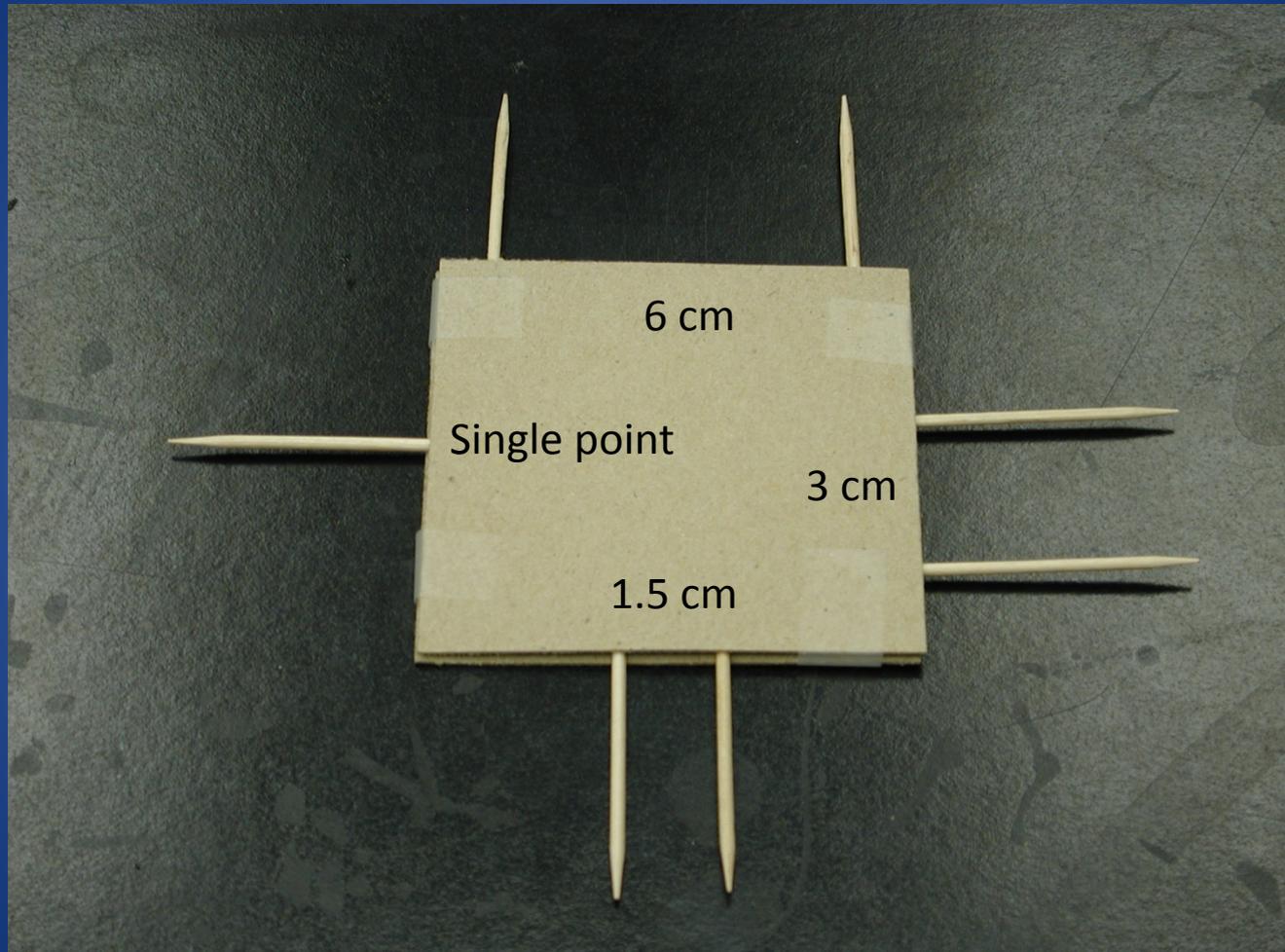


What is being mapped here?

Surface area?

SENSORY RECEPTOR DENSITY

Two-point discrimination tool



Also - 0.75 cm and 0.38 cm on a separate card.

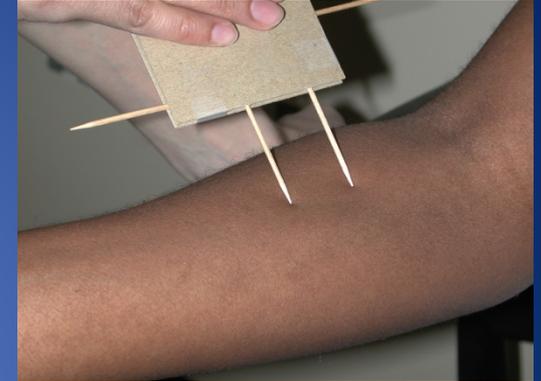
Two-point discrimination test



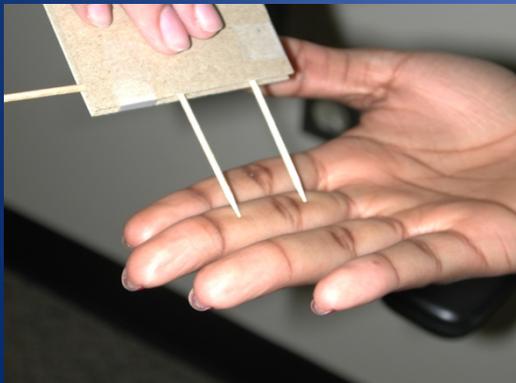
Head



Torso



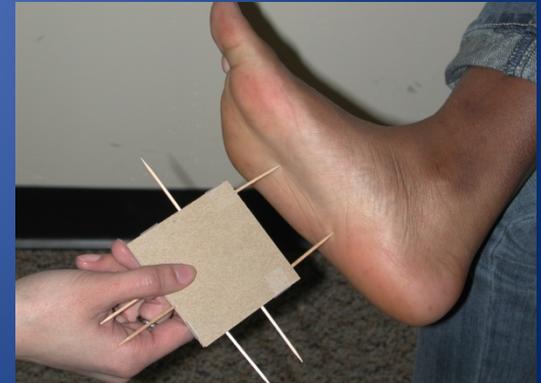
Arm



Hand

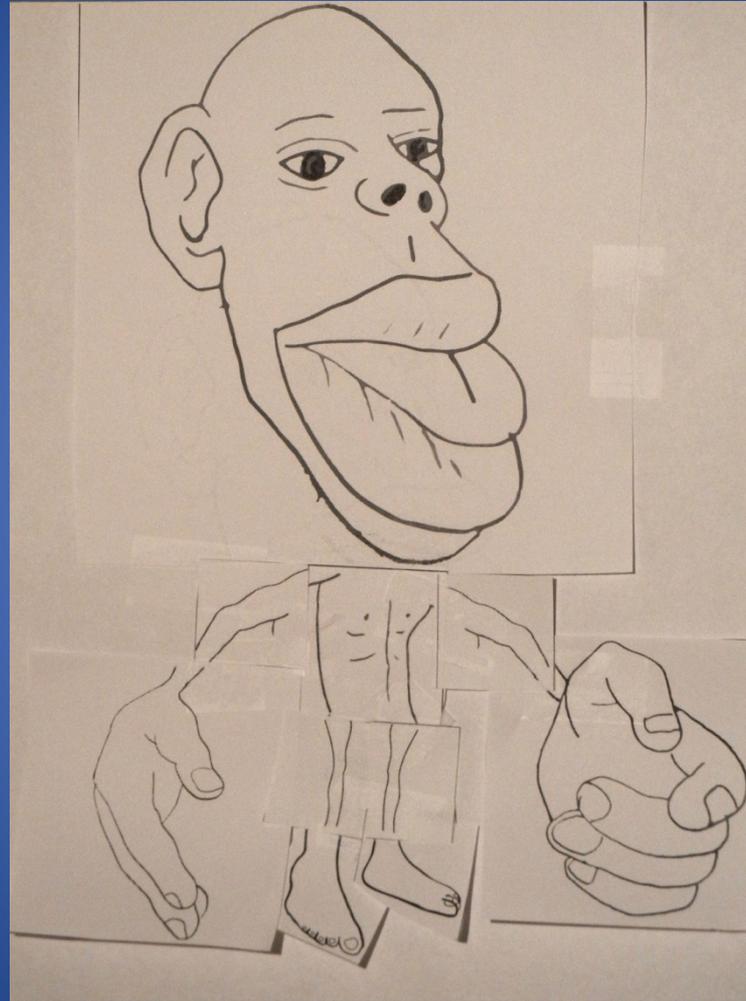


Leg



Foot

Your Personal Homunculus



Constructing your Homunculus

The two-point discrimination threshold for each body part is reciprocally related to the size of each corresponding homunculus region.

Calculation

$$\text{Body part size (cm)} = 10 \times \left(\frac{1}{\text{two-point discrimination threshold (cm)}} \right)$$

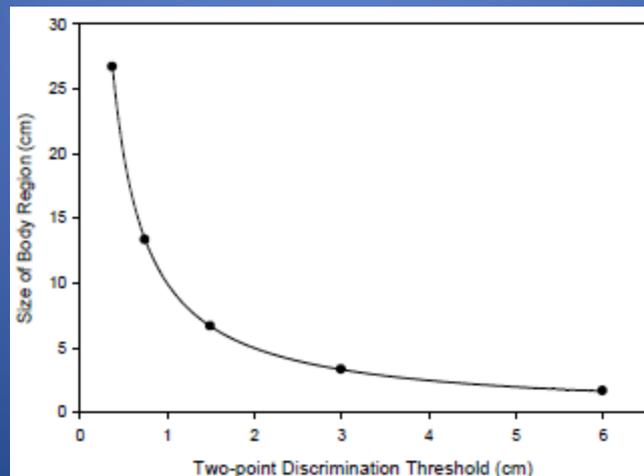
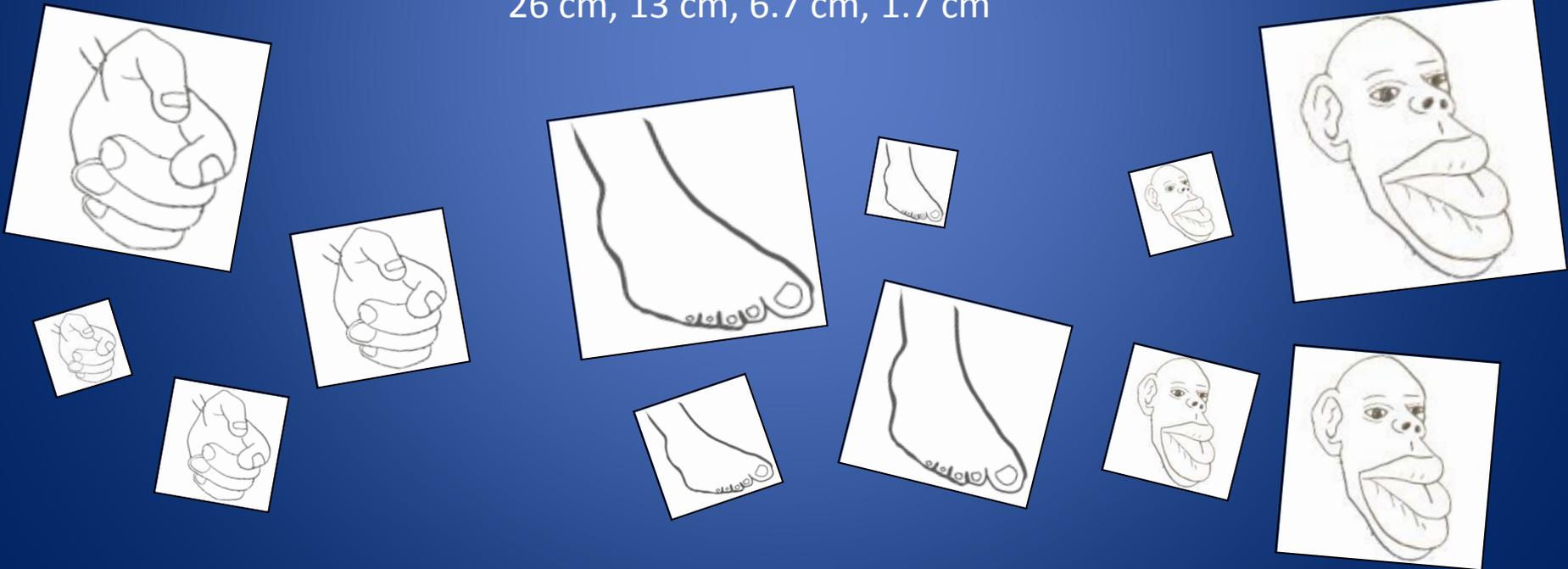


Figure 6. Reciprocal relation between the two-point discrimination threshold and the size of the body region representation on the homunculus

Constructing your Homunculus

Body parts with more sensory receptors, such as the fingers, map to larger areas of the brain, and should be represented by a larger picture in your personal homunculus.

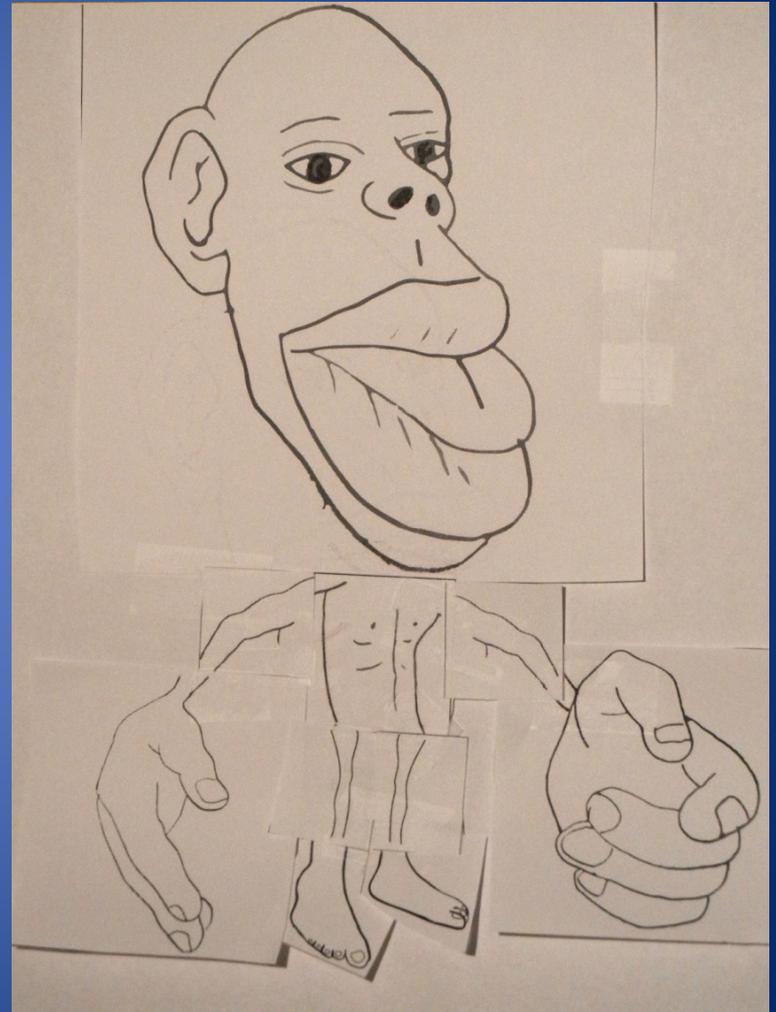
*Body part pictures of various sizes, taped together:
26 cm, 13 cm, 6.7 cm, 1.7 cm*



Do it Yourself!

- Download the workshop handout, which contains major lecture points and a detailed description of the homunculus activity.
- Download the homunculus body part cutouts and replicate the activity in your classroom.

Visit [BrainFacts.org](https://www.brainfacts.org) to download supplementary workshop materials.



Your Personal Homunculus



<http://www.maxplanckflorida.org/fitzpatricklab/homunculus/>