

Neurociencia cognitiva

2do cuatrimestre 2024

Clase 2: Neuronas, cerebro y métodos

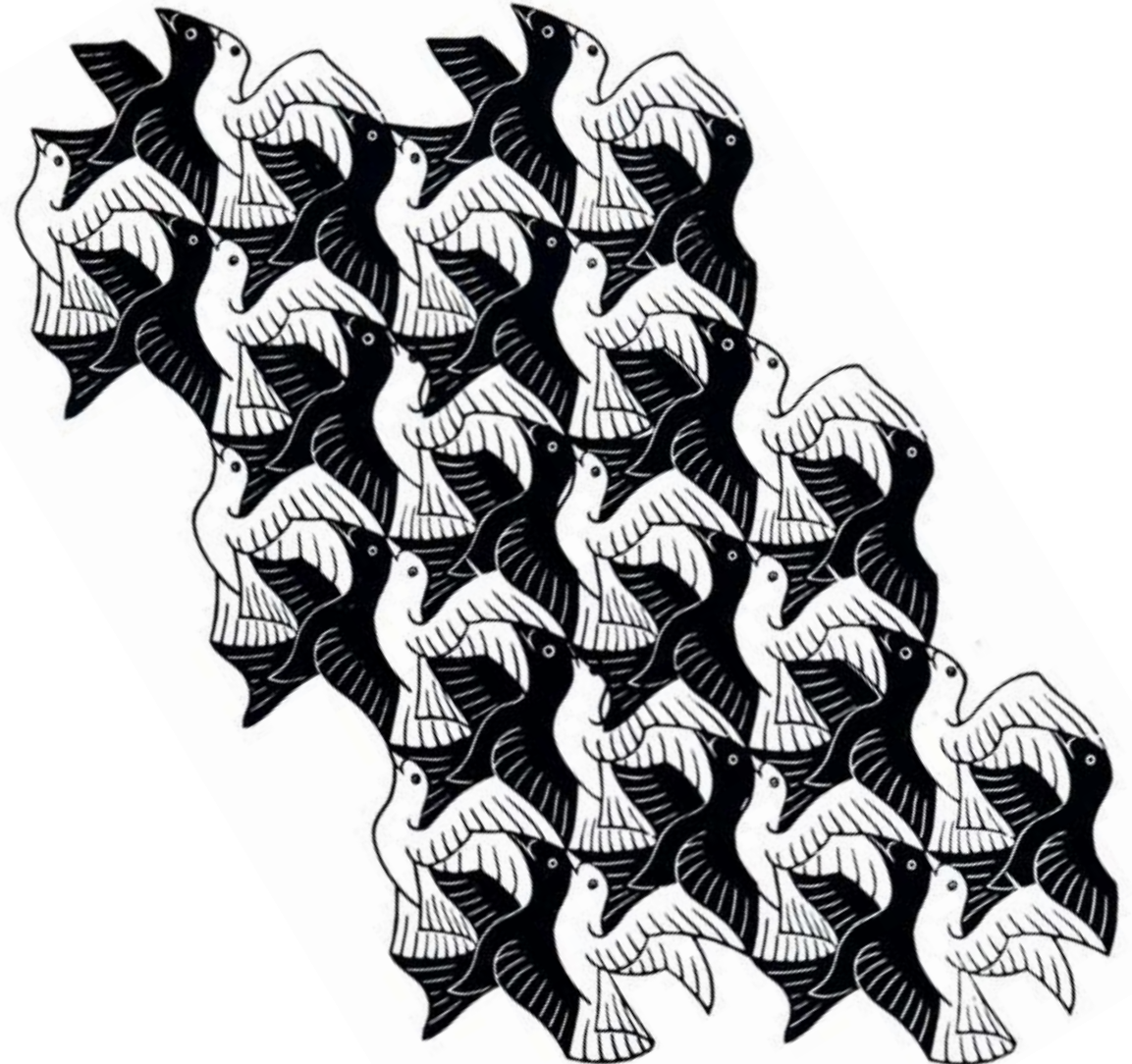
<http://materias.df.uba.ar/nca2024c2/>

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¿Cómo funcionan las neuronas a nivel celular?

¿Cómo están organizadas las neuronas en el cerebro?

Métodos de la neurociencia cognitiva

¿Cómo funcionan las neuronas a nivel celular?

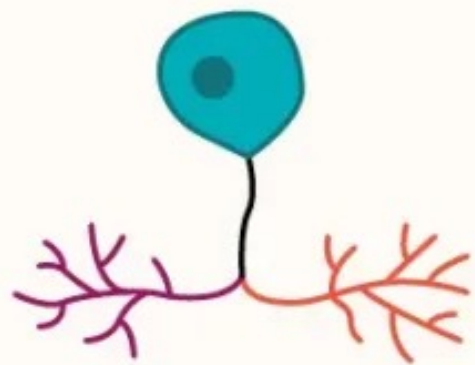
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Métodos de la neurociencia cognitiva

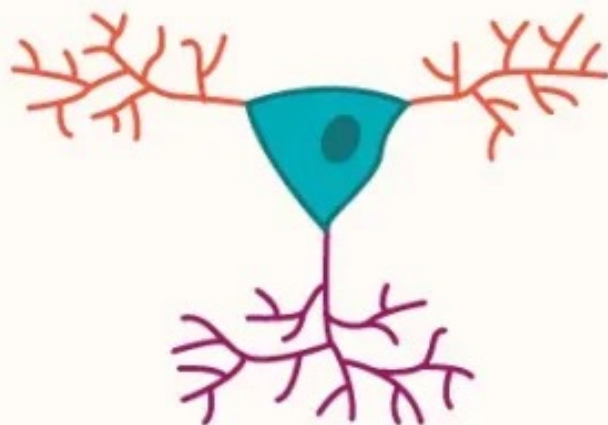


B.







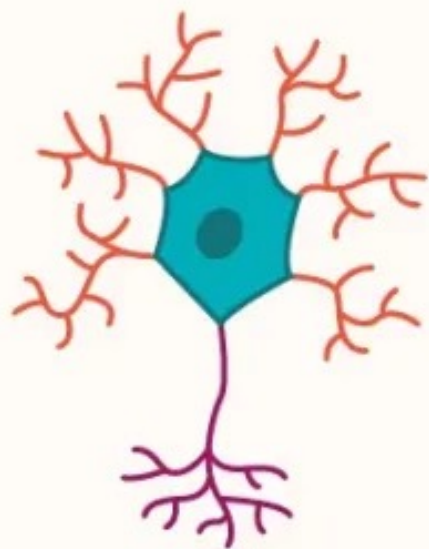


unipolar



pyramidal

	nucleus
	cell body
	axon/synapses
	dendrites



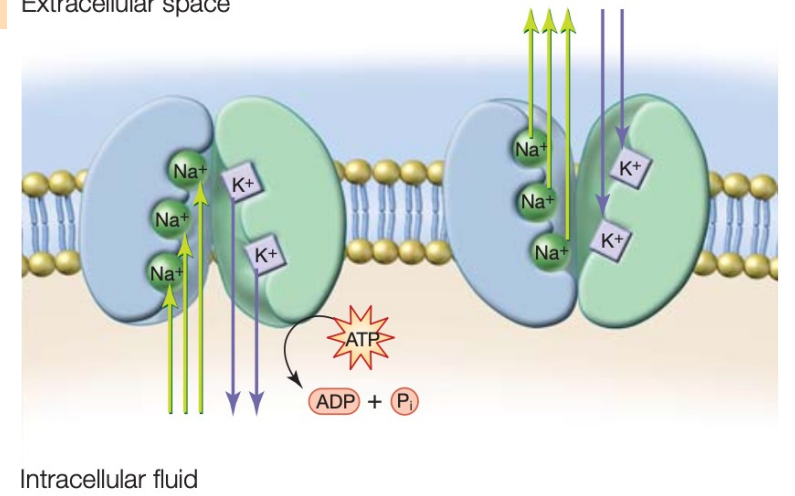
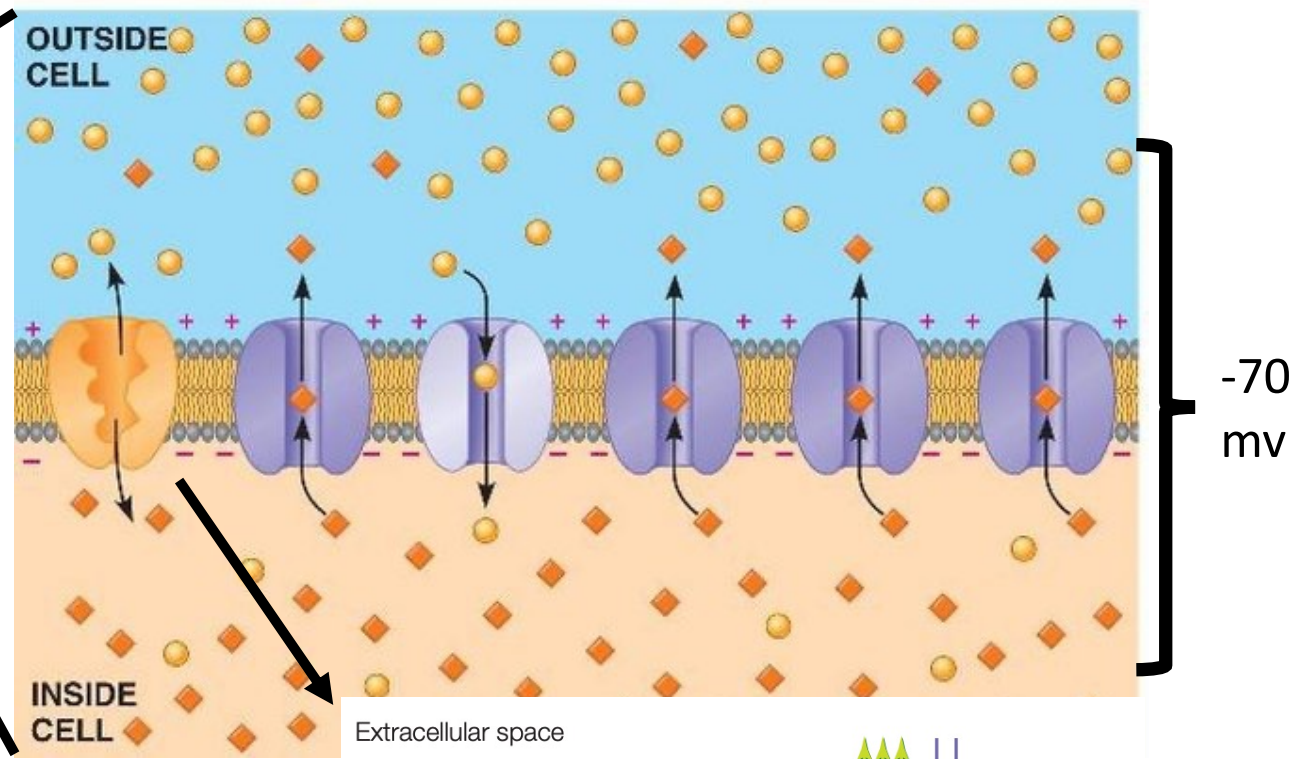
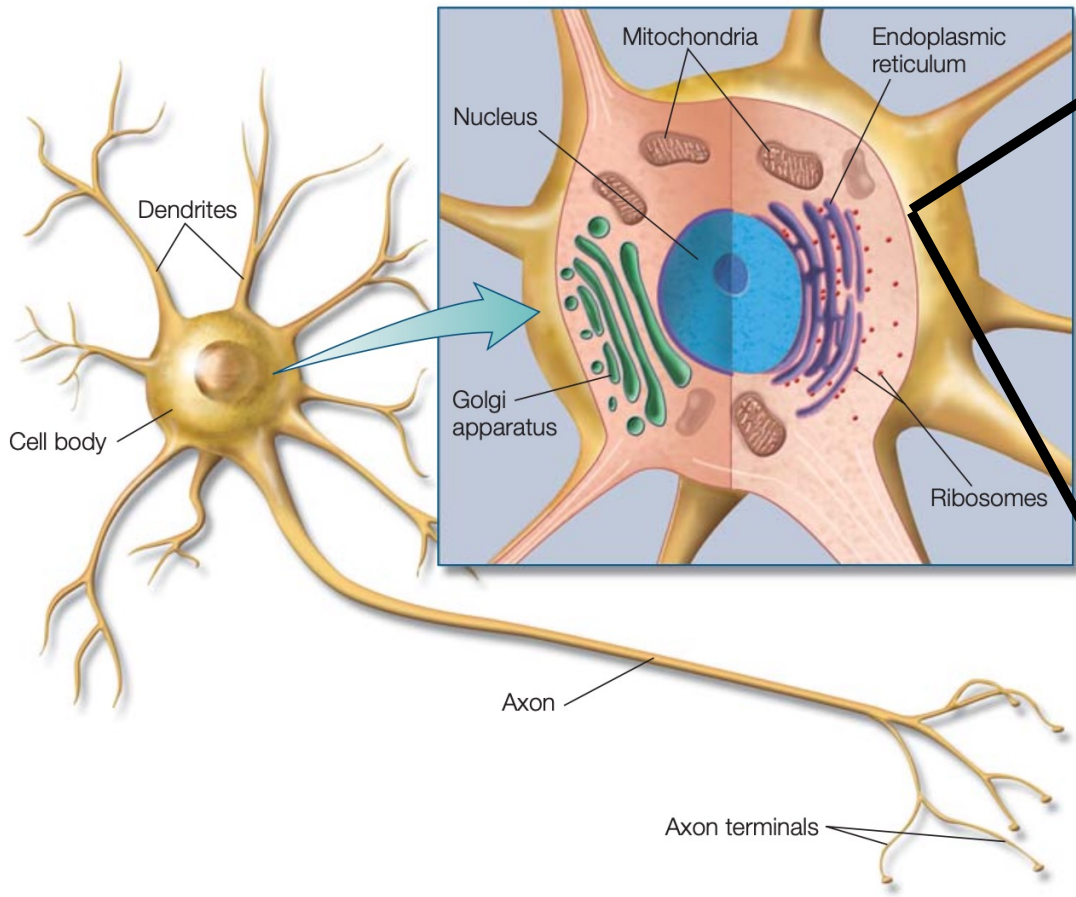
multipolar

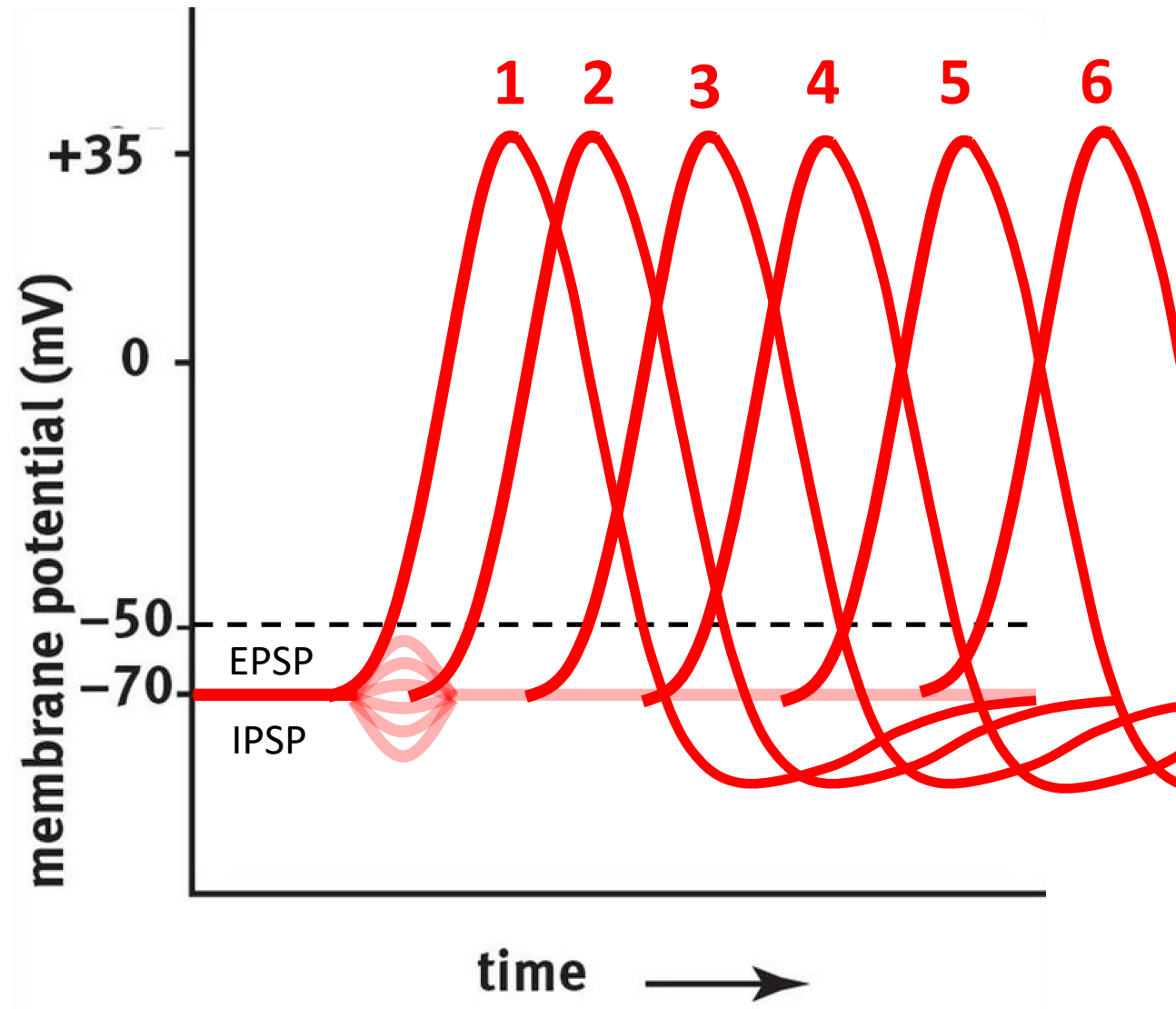
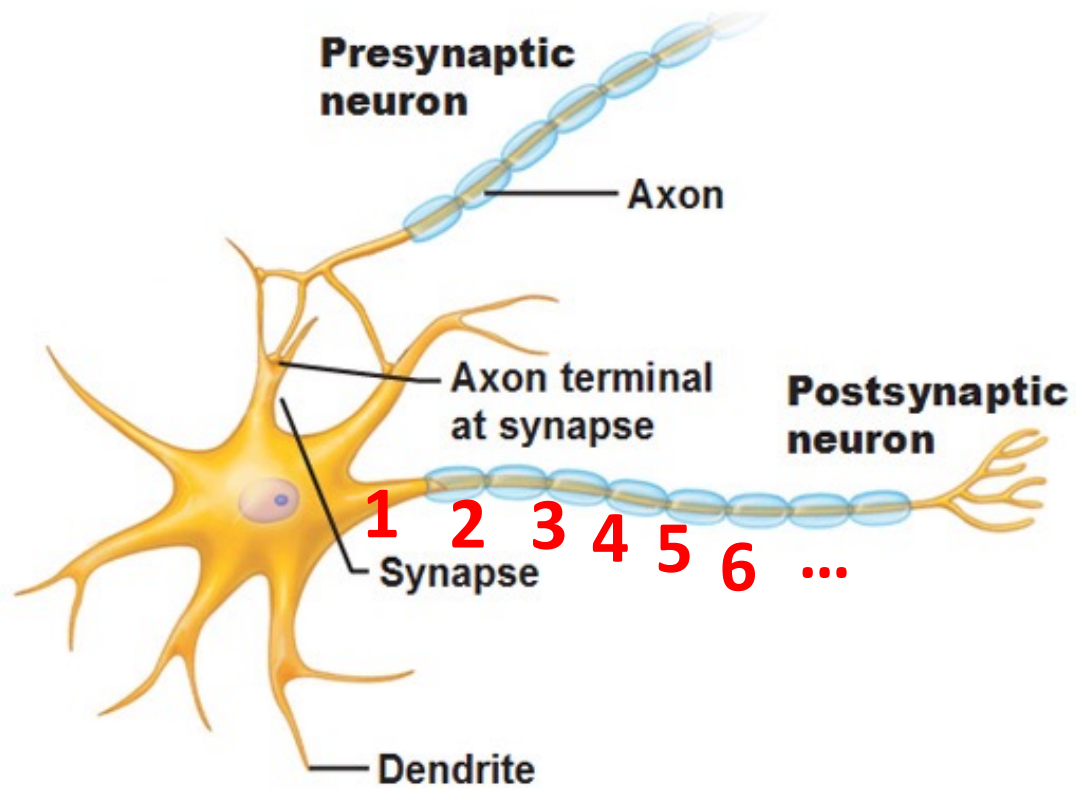


bipolar

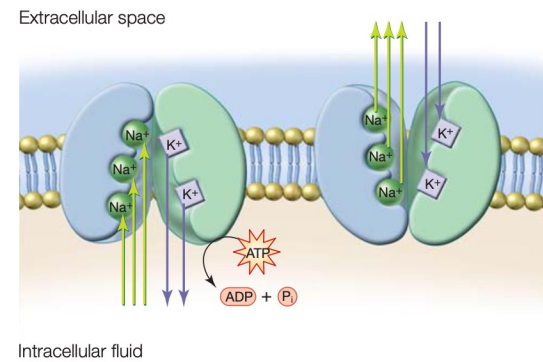
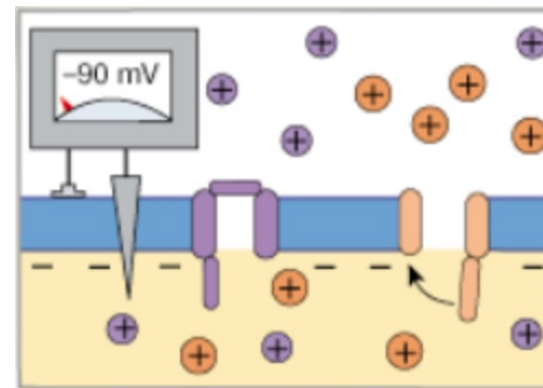
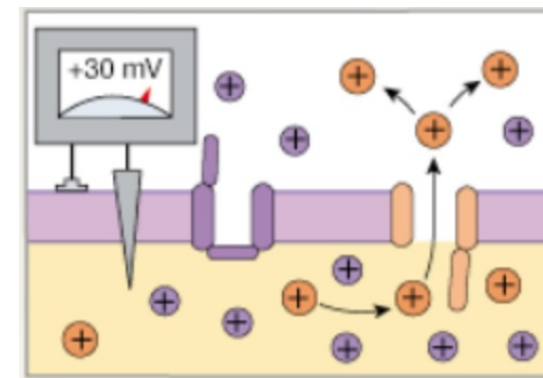
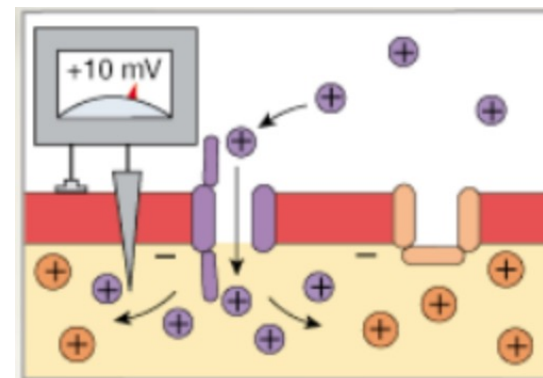
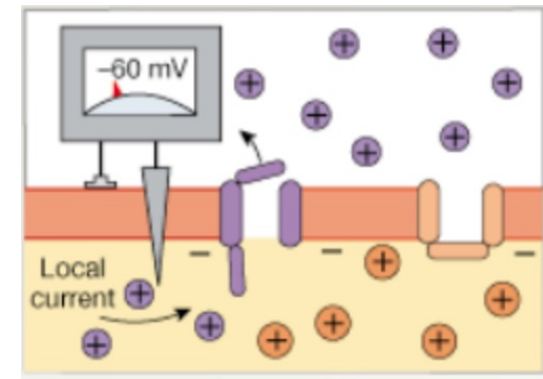
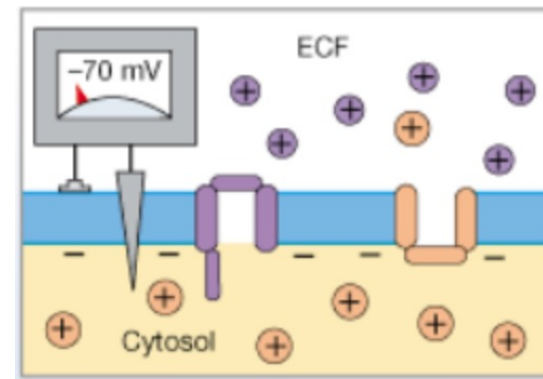
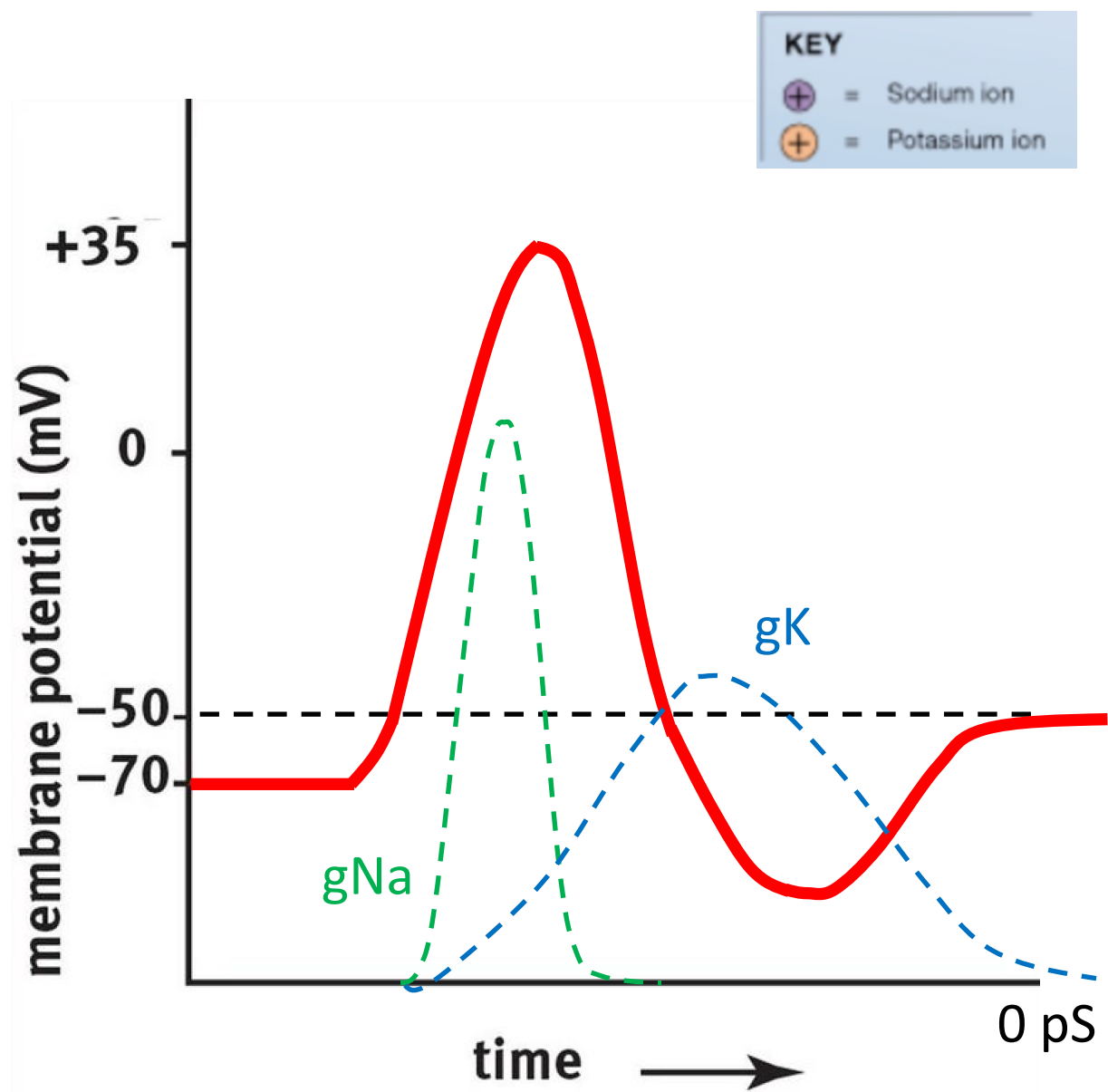


Purkinje

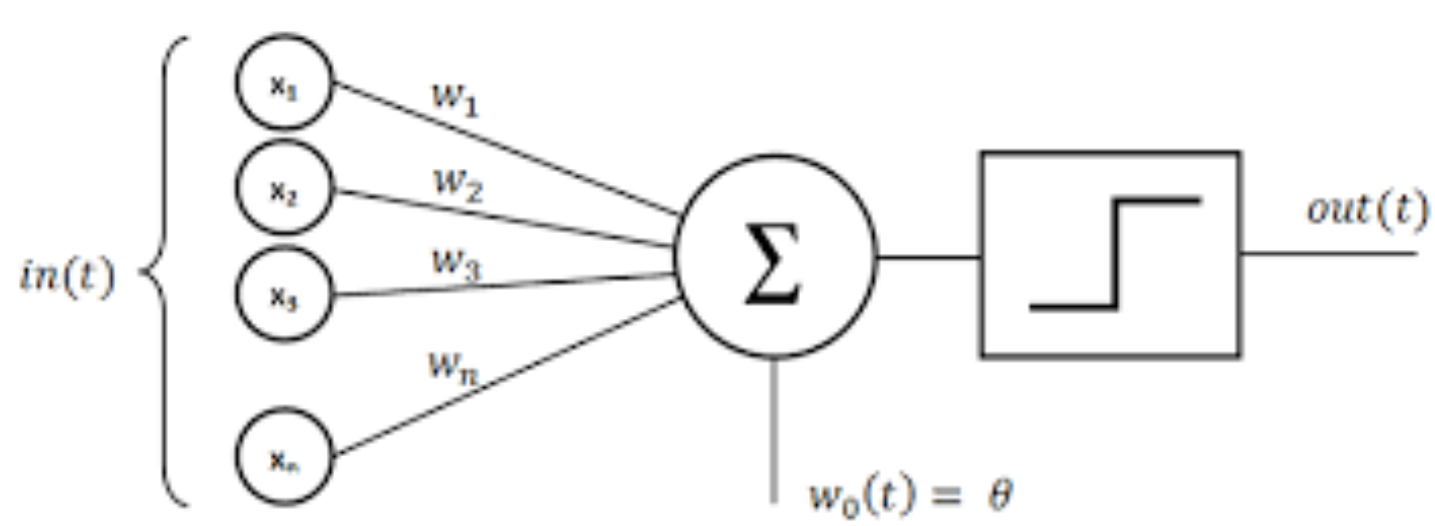
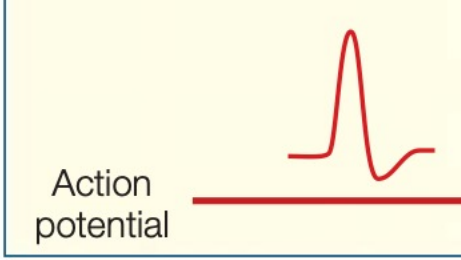
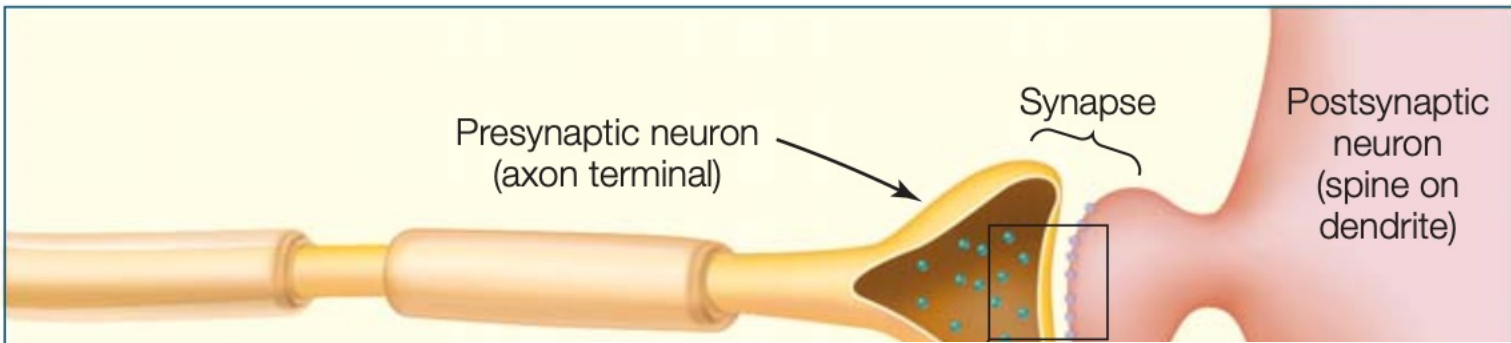




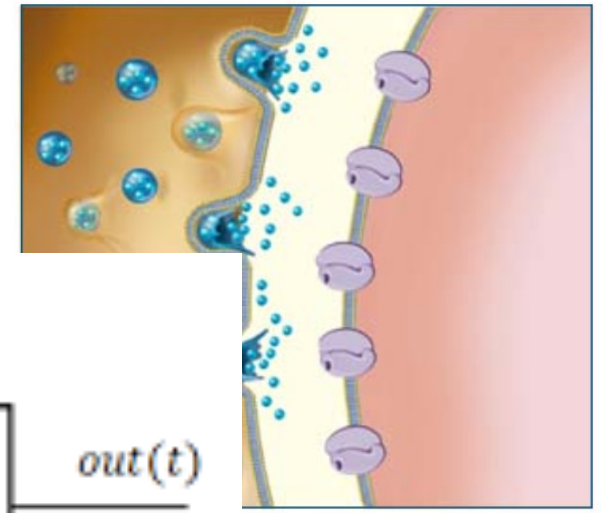
EPSP = *Excitatory post-synaptic potential*
 IPSP = *Inhibitory post-synaptic potential*



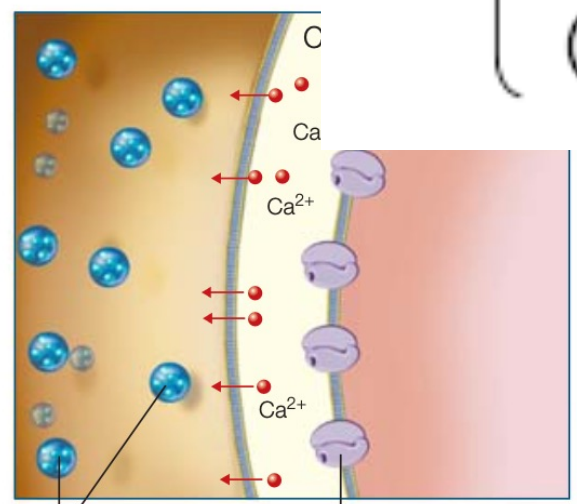




③ Release of neurotransmitter by exocytosis into the synaptic cleft

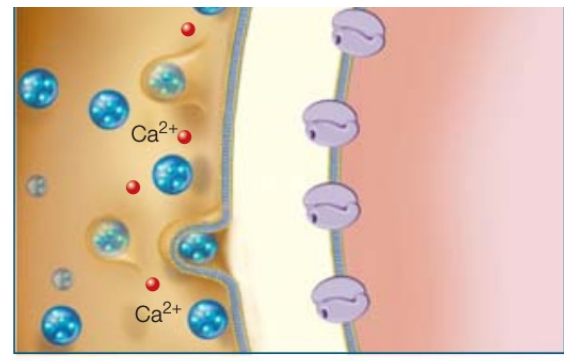


① Action potential depolarizes terminal membrane, Ca^{2+} flows into the

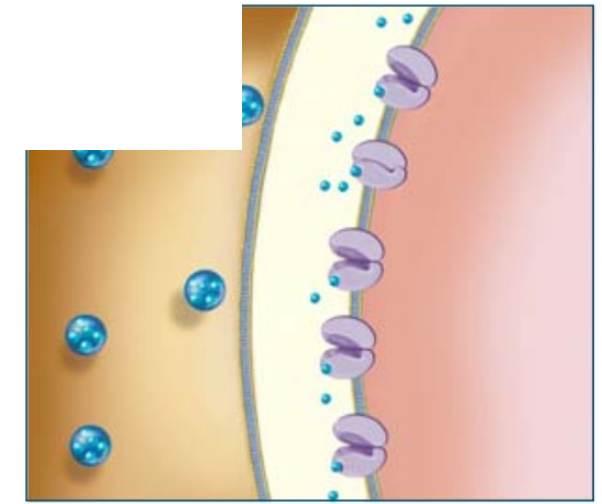









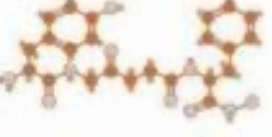
Vesicles containing neurotransmitter

Receptors in postsynaptic membrane



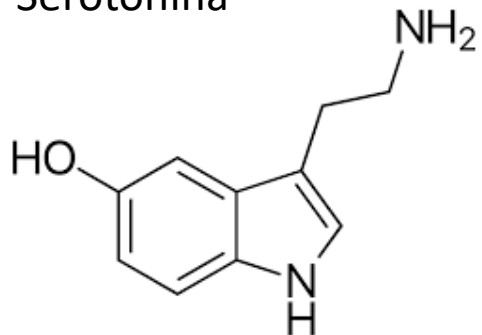
binds with receptor



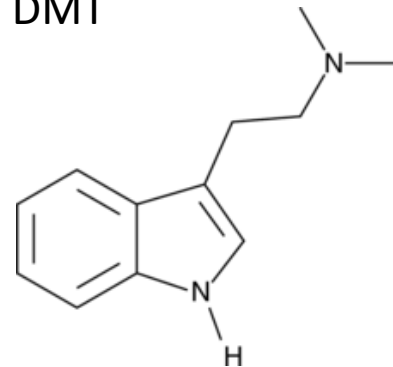
ADRENALINE	NORADRENALINE	DOPAMINE	SEROTONIN
			
Fight or flight neurotransmitter	Concentration neurotransmitter	Pleasure neurotransmitter	Mood neurotransmitter
GABA	ACETYLCHOLINE	GLUTAMATE	ENDORPHINS
			
Calming neurotransmitter	Learning neurotransmitter	Memory neurotransmitter	Euphoria neurotransmitter



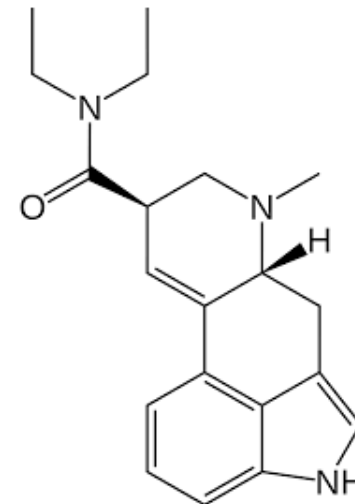
Serotonina



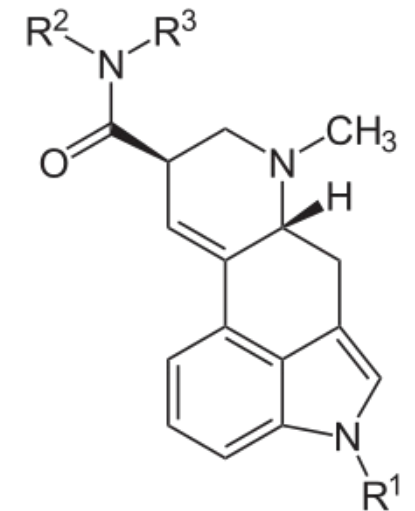
DMT

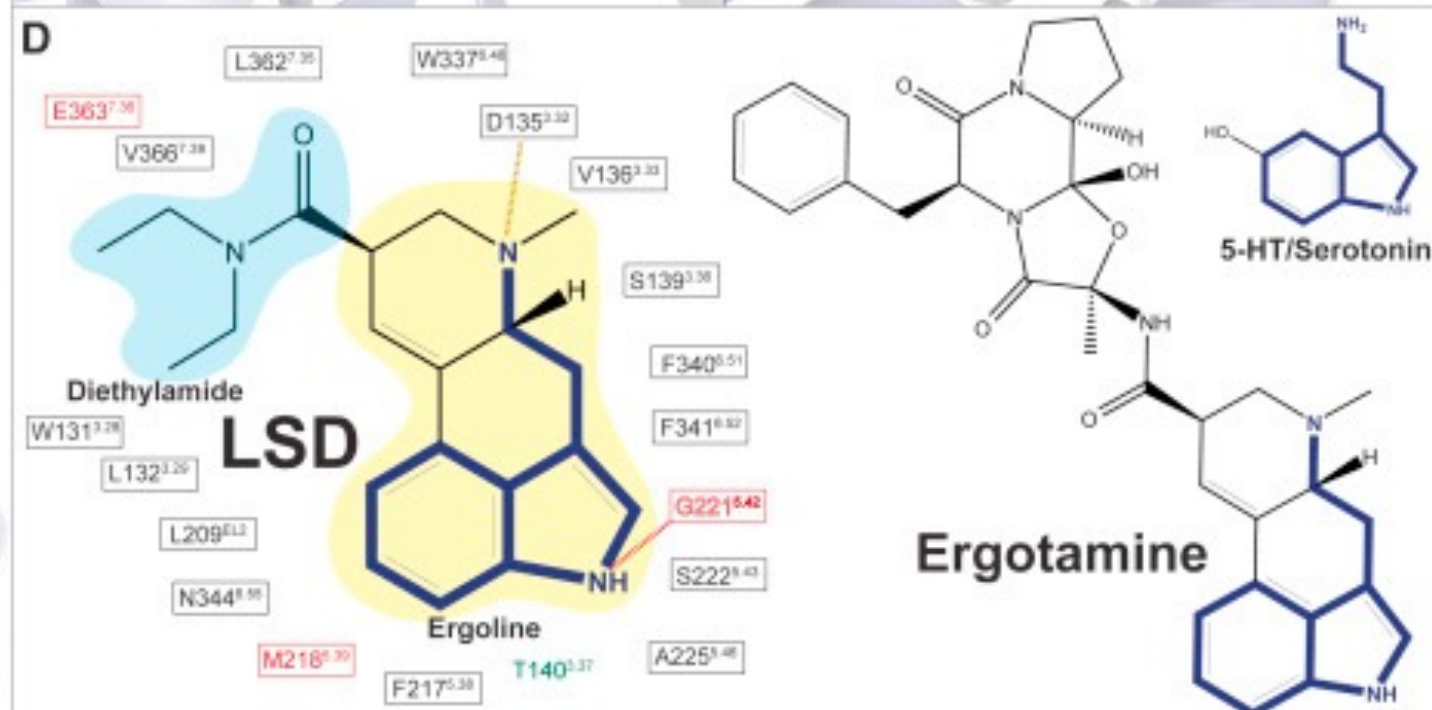
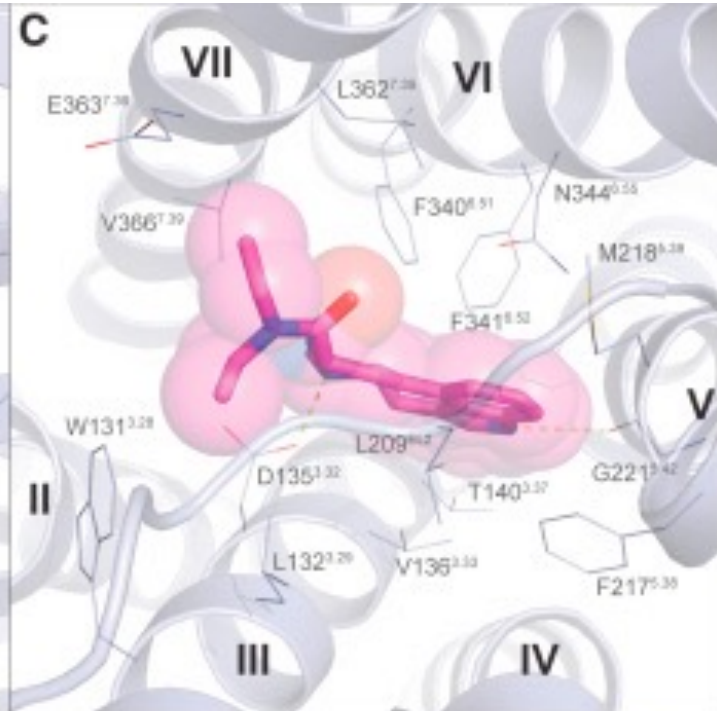
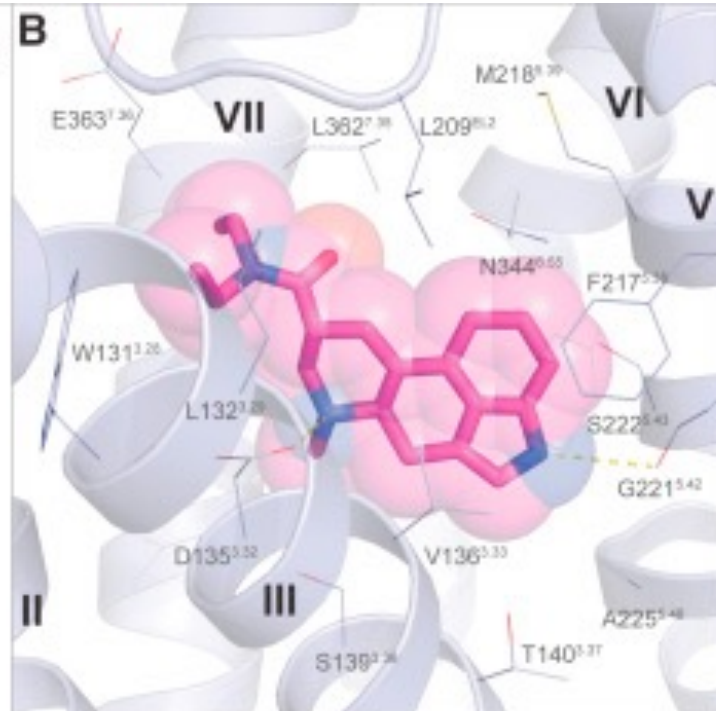
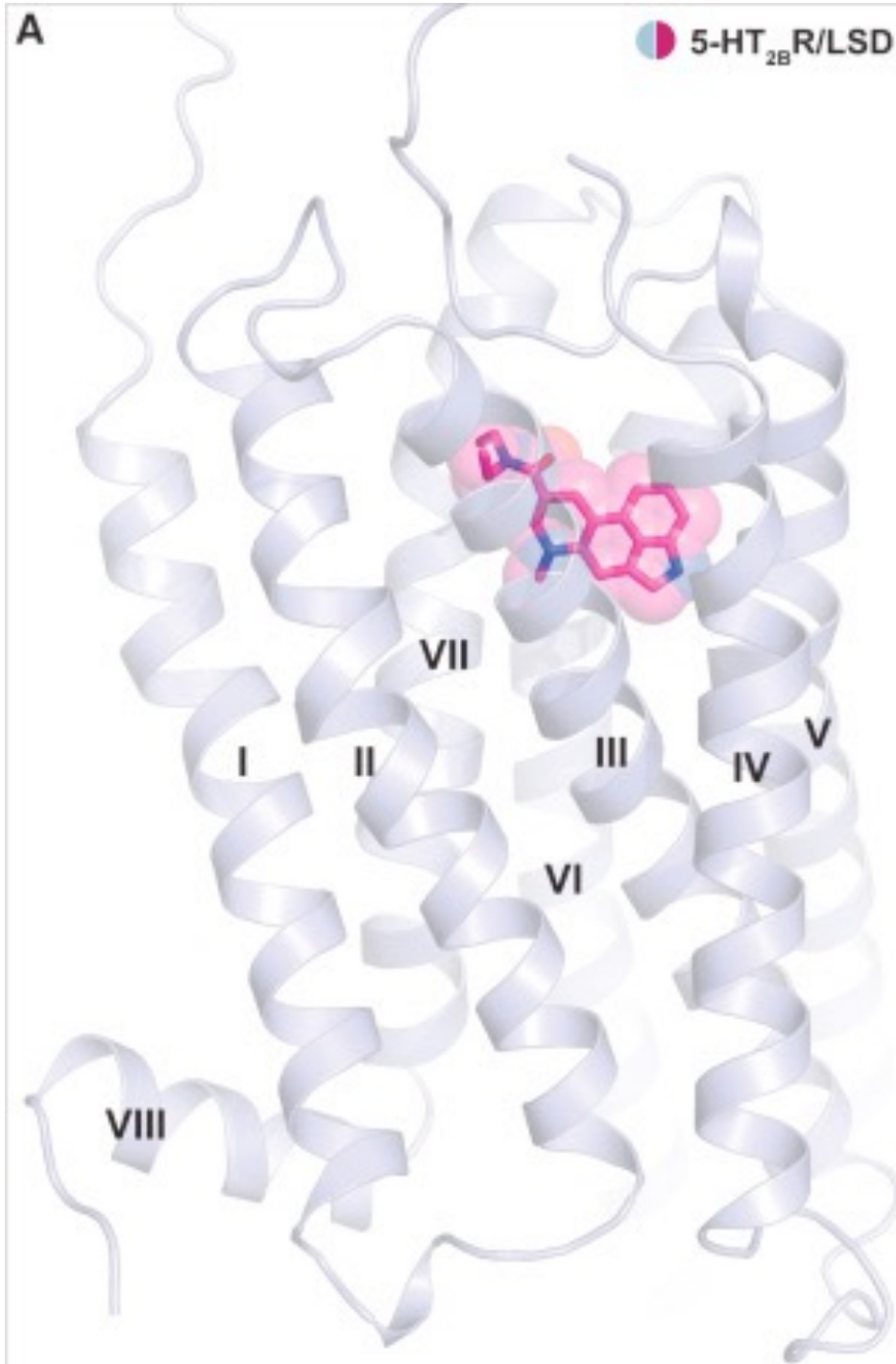


LSD



Ergolina

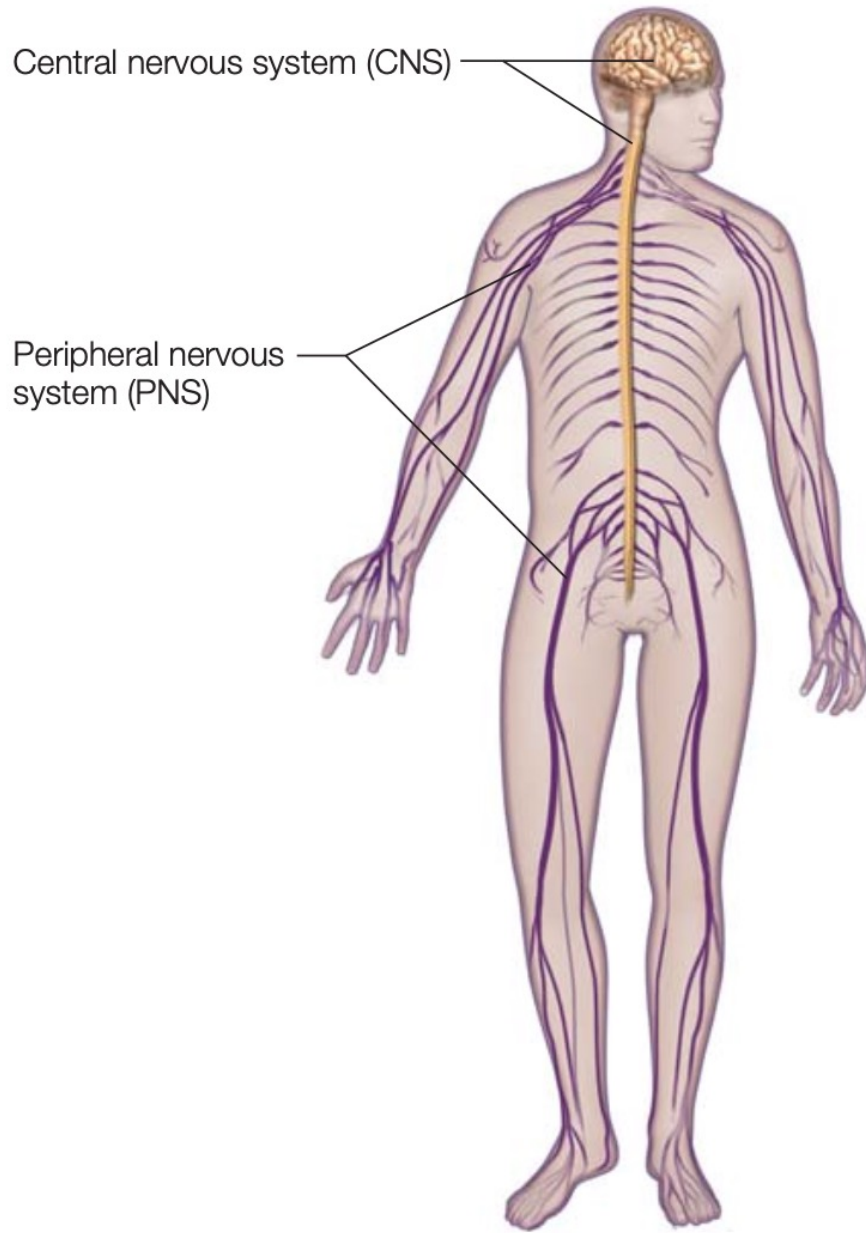




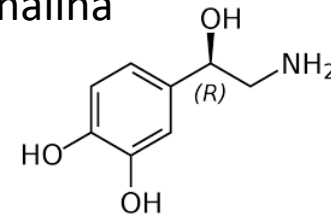
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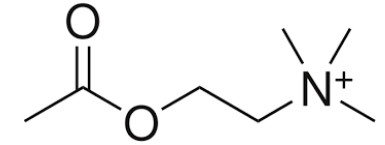
Métodos de la neurociencia cognitiva



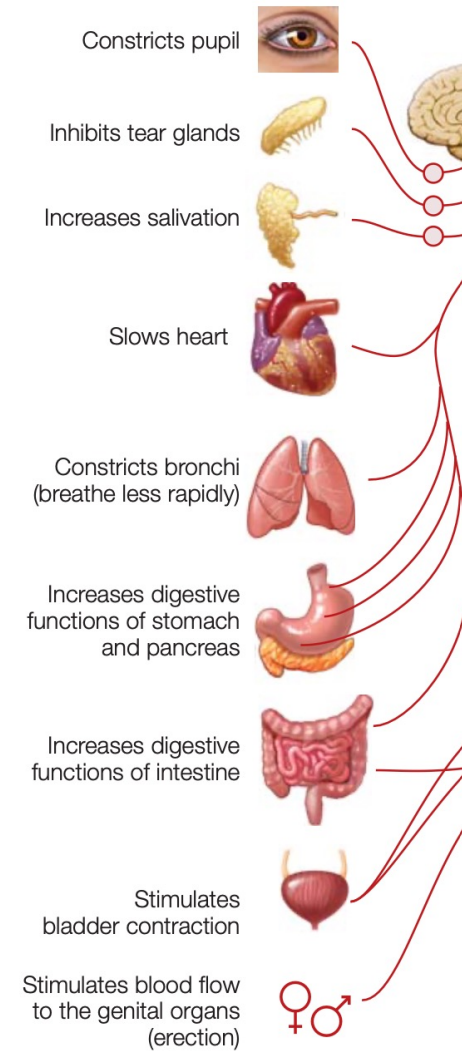
Noradrenalina



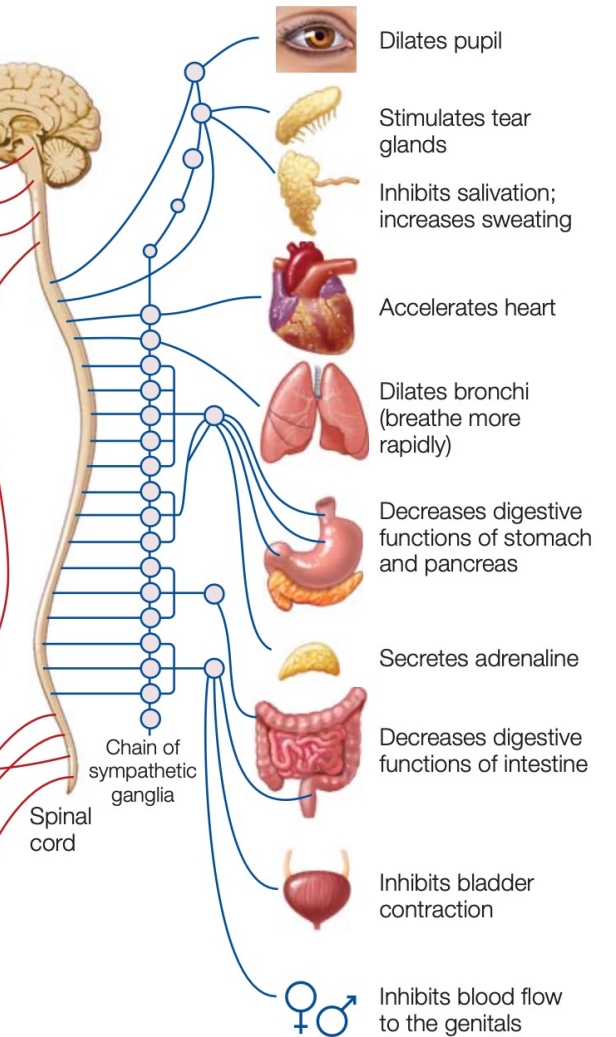
Acetilcolina



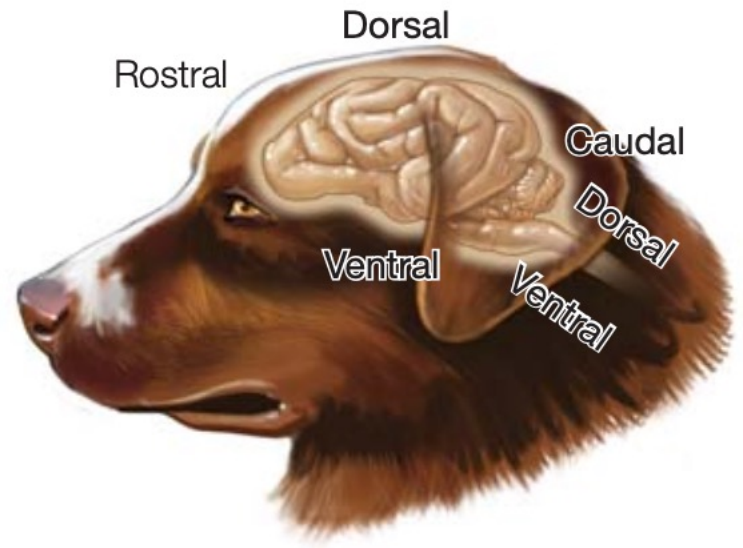
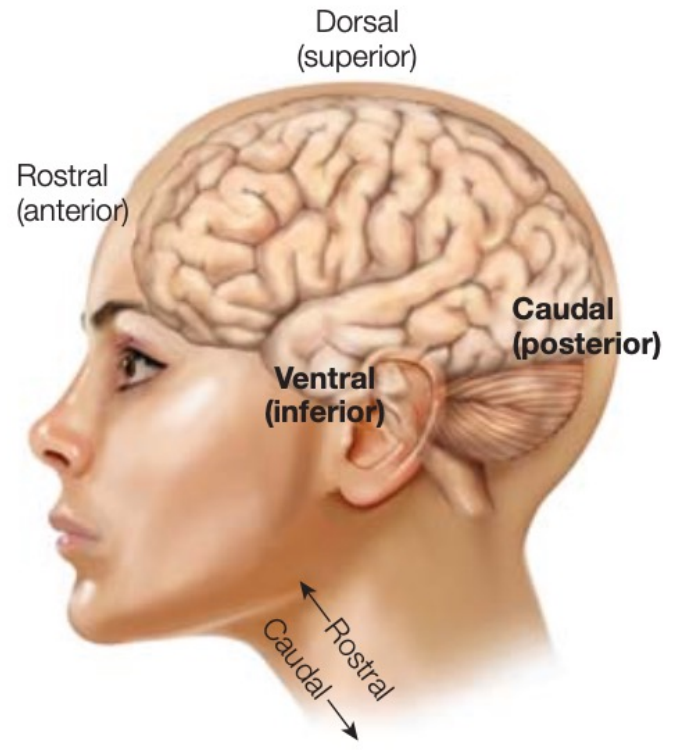
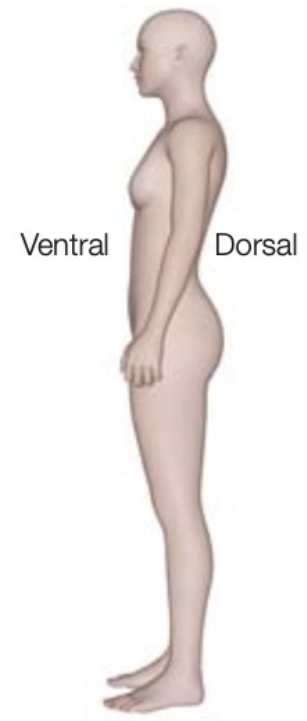
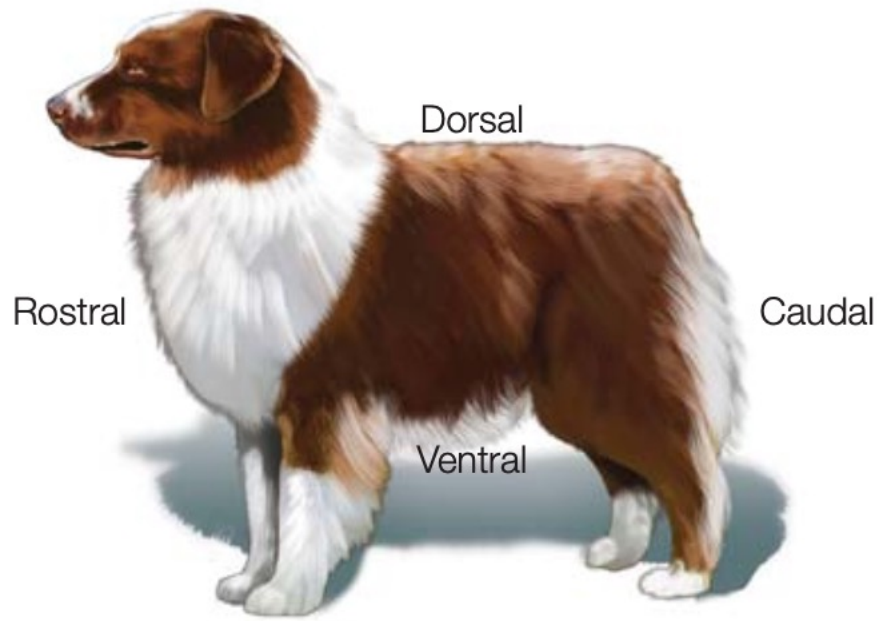
Parasympathetic branch

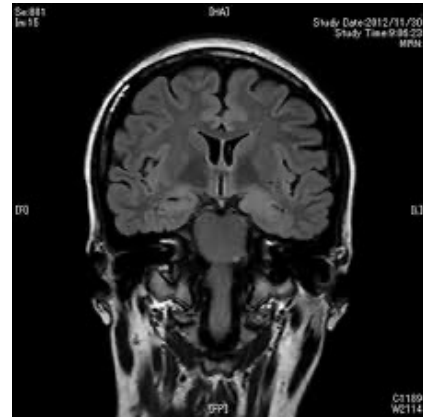
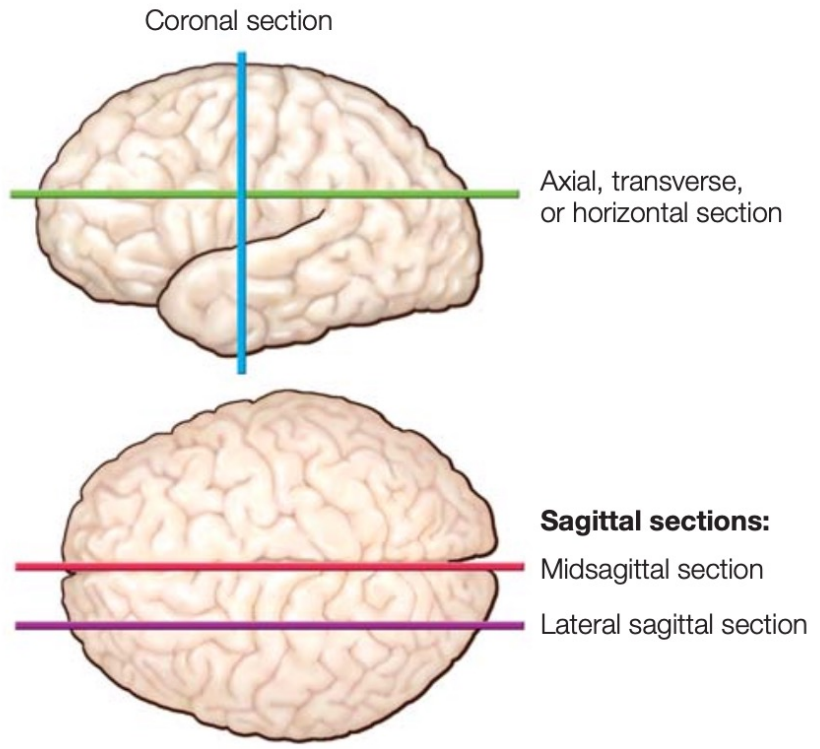


Sympathetic branch

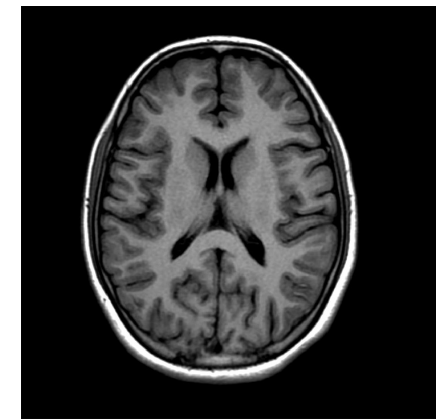


Chain of sympathetic ganglia
Spinal cord

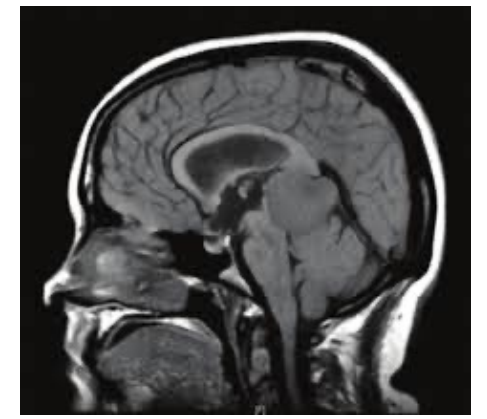




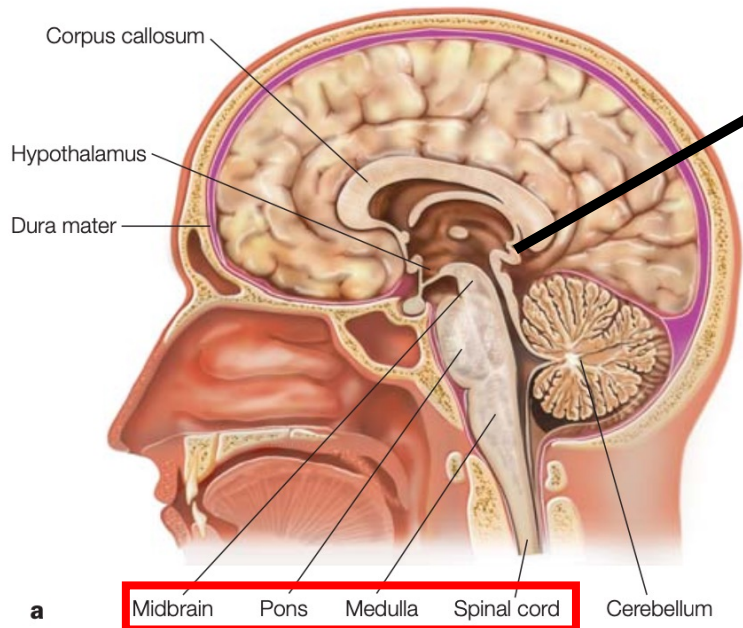
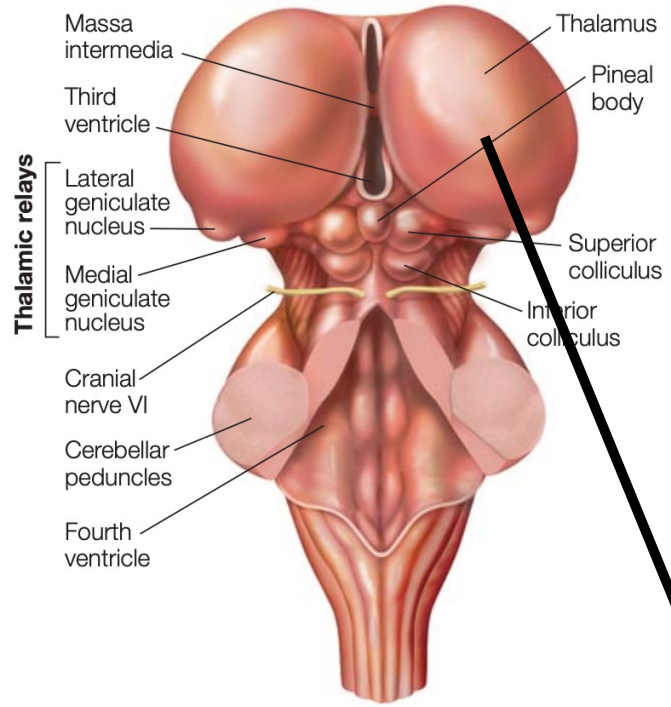
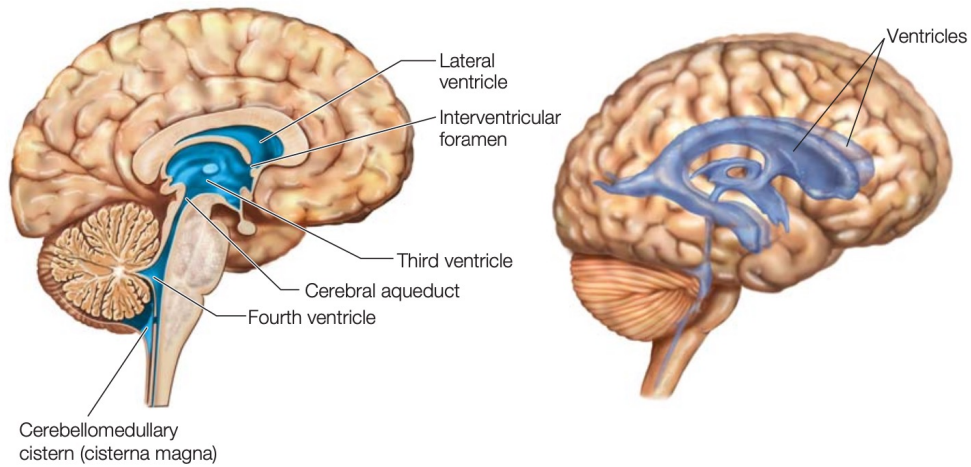
Coronal



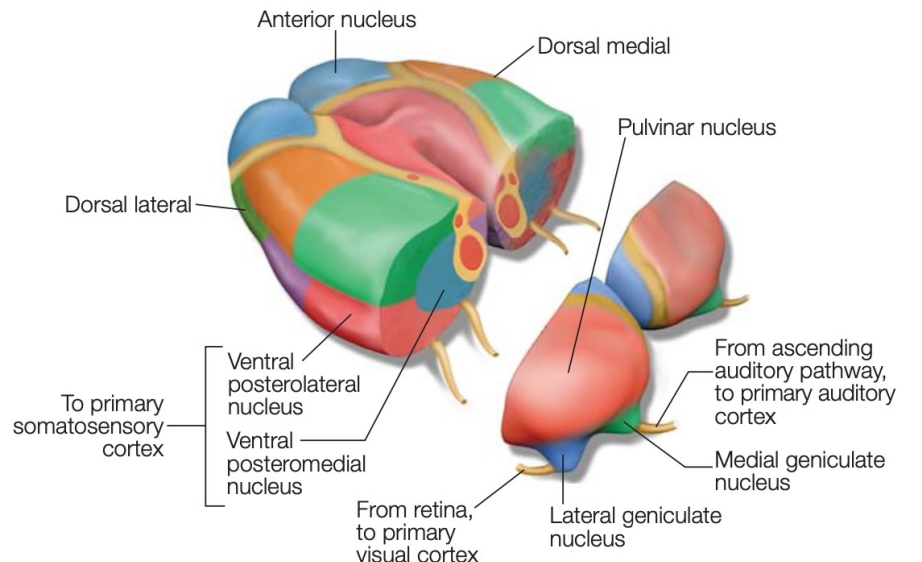
Axial



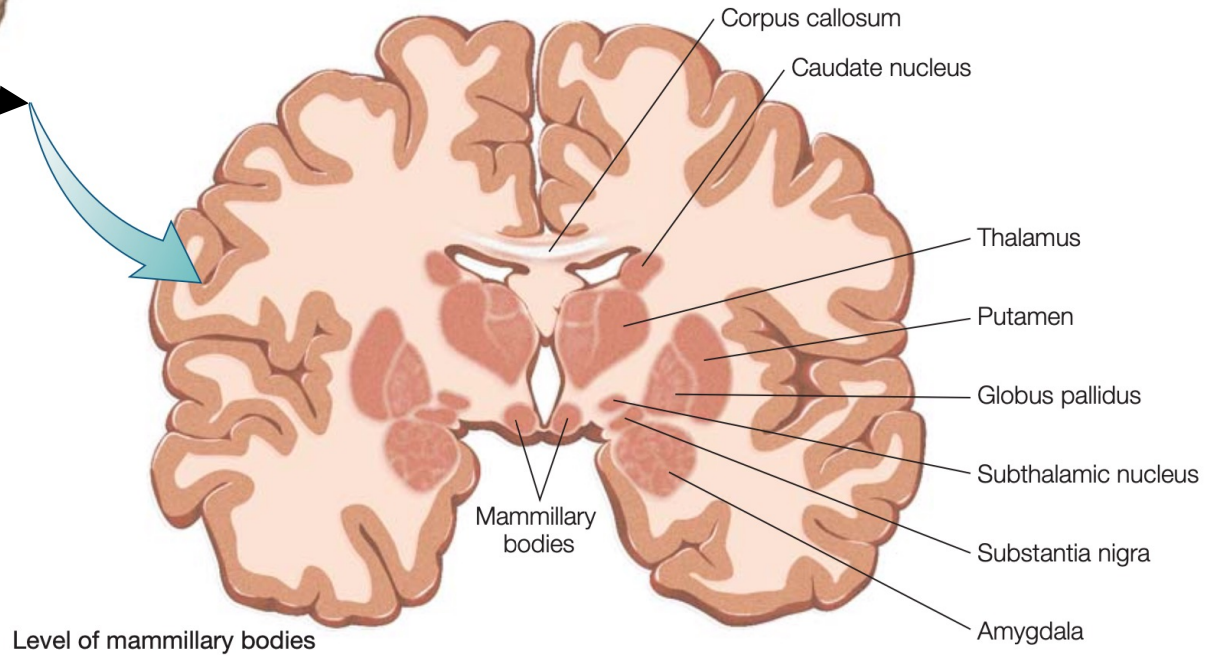
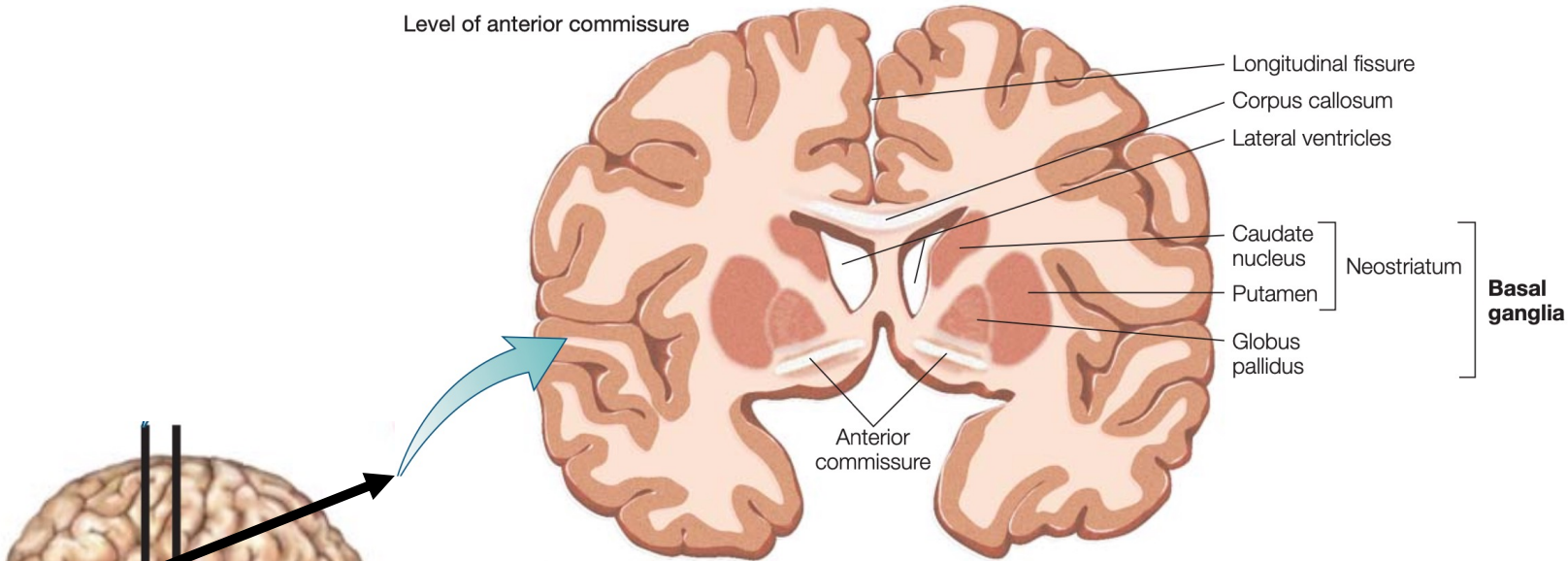
Sagittal



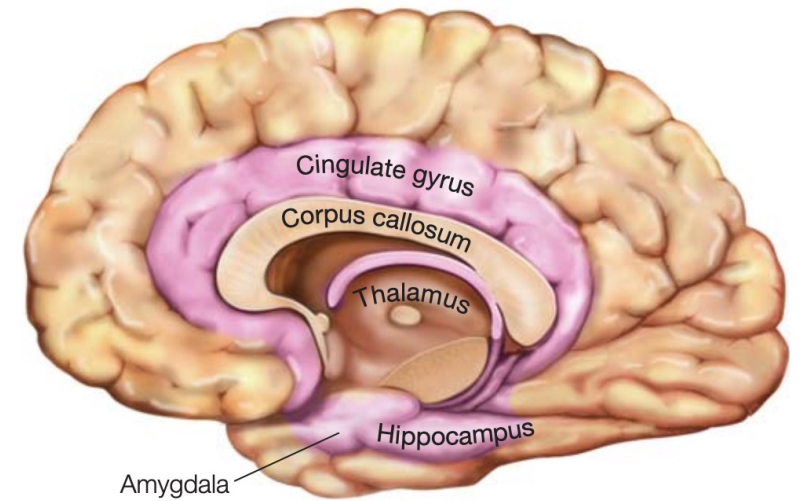
“sin eso no vivimos”

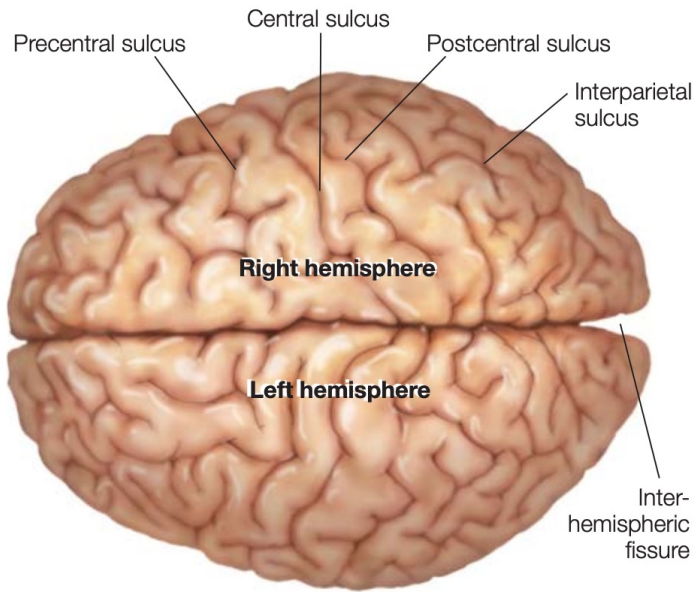
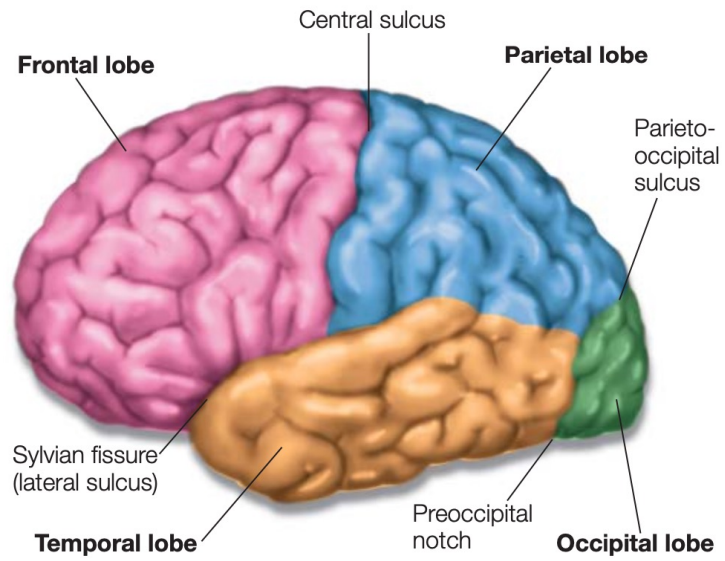
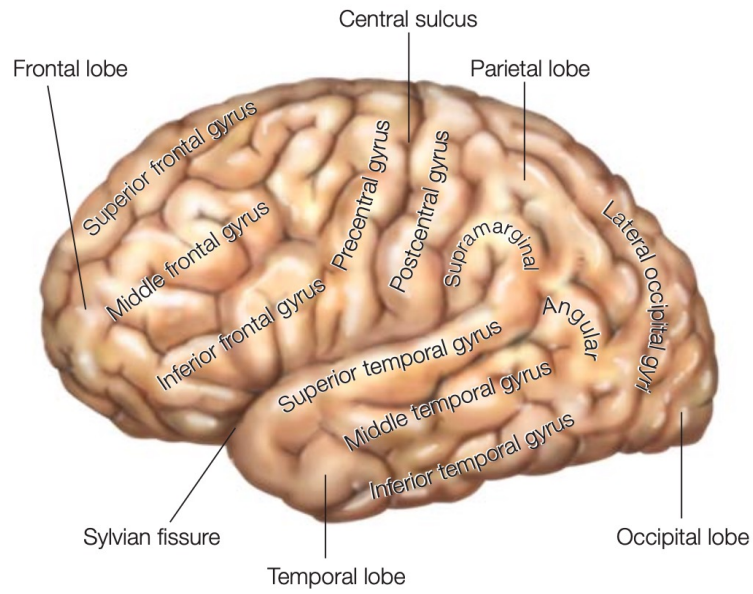


Level of anterior commissure

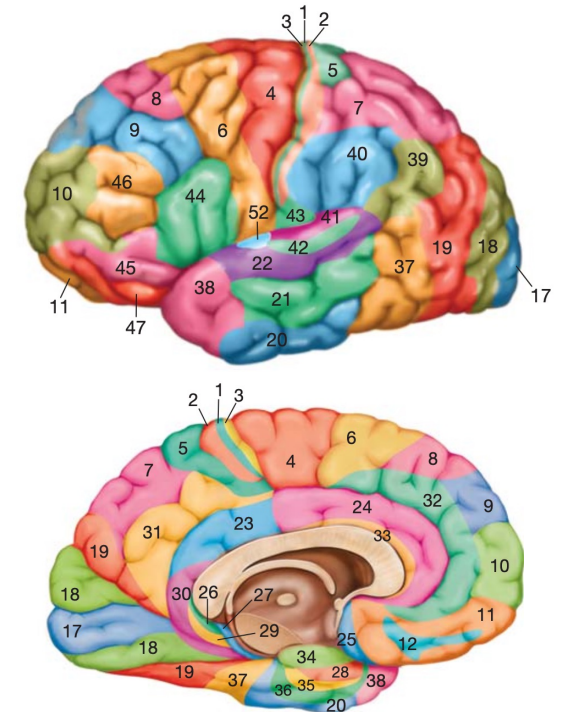
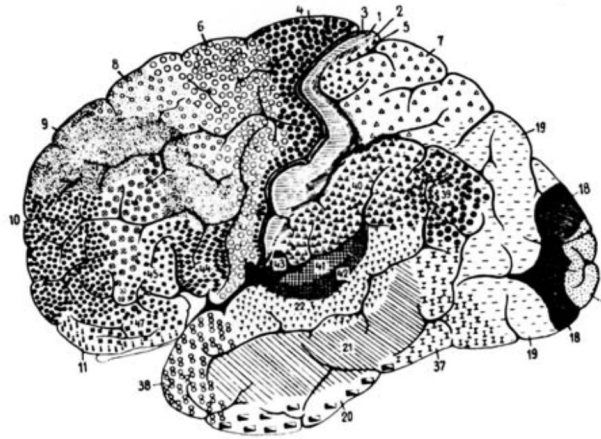


Level of mammillary bodies

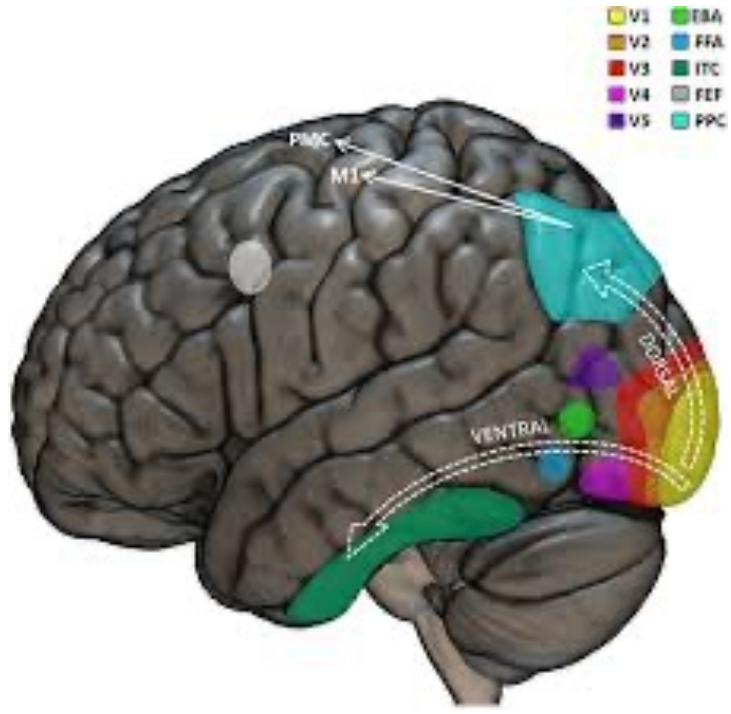




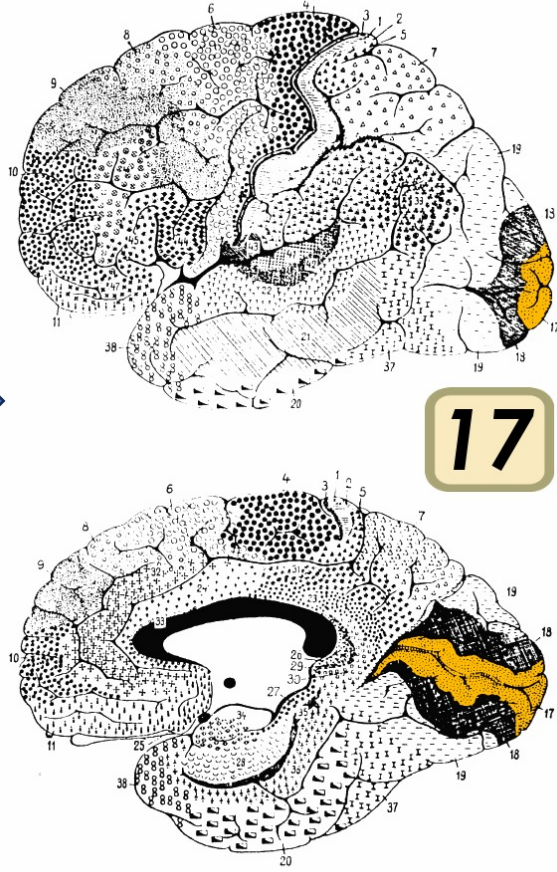
Brodmann



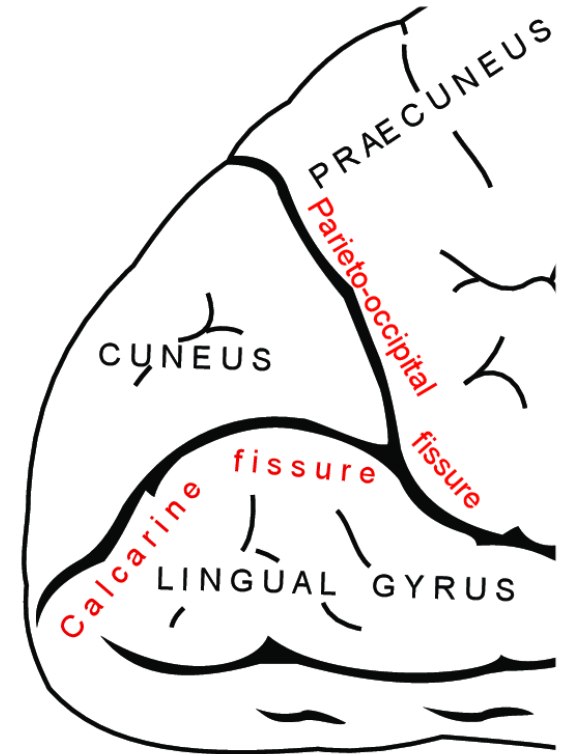
Funcional

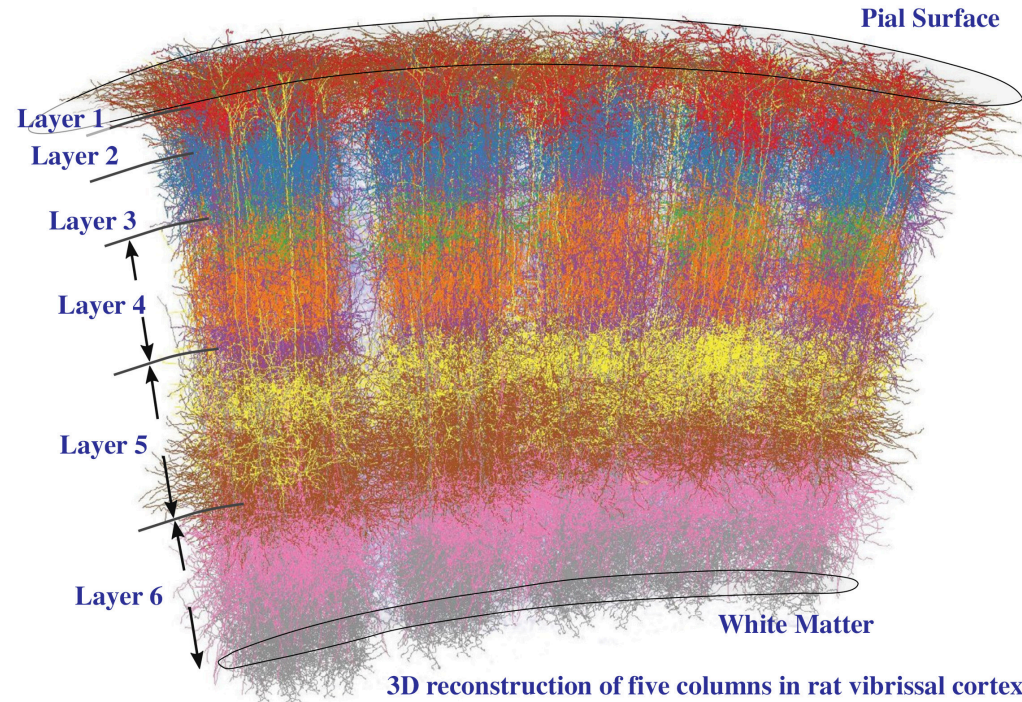
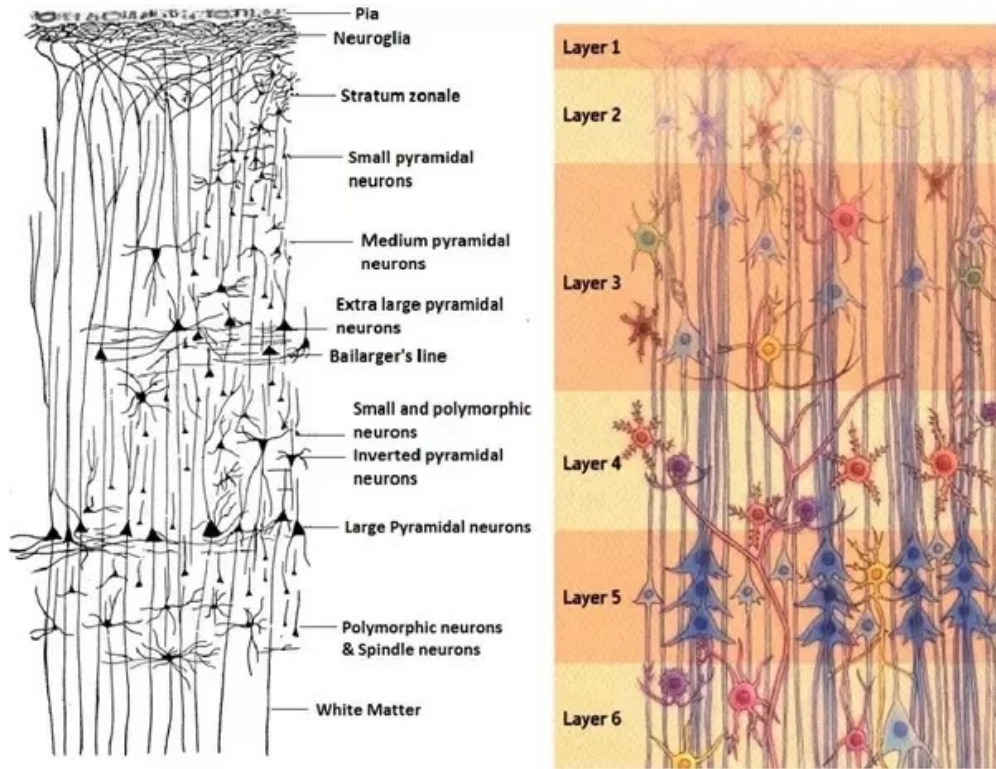


Citoarquitectónico (Brodmann)



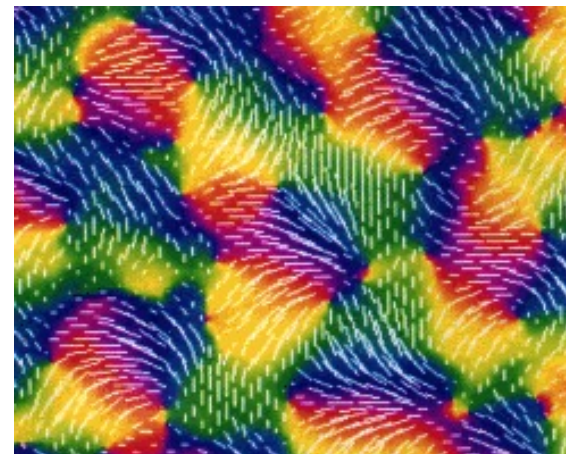
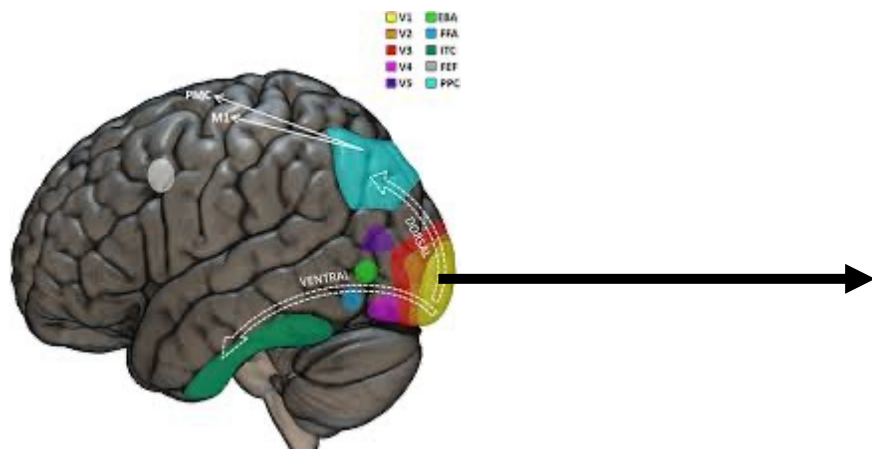
Anatómico



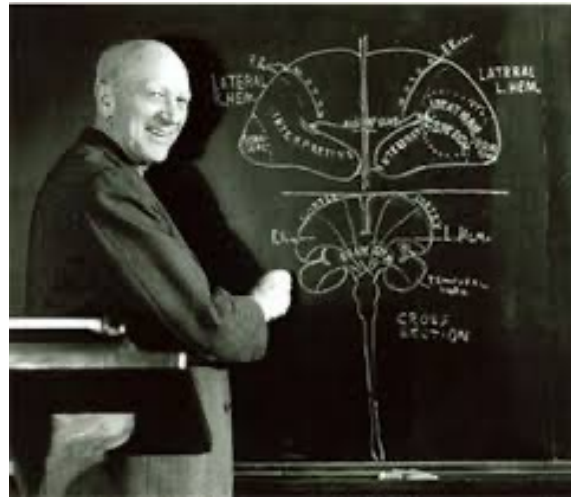
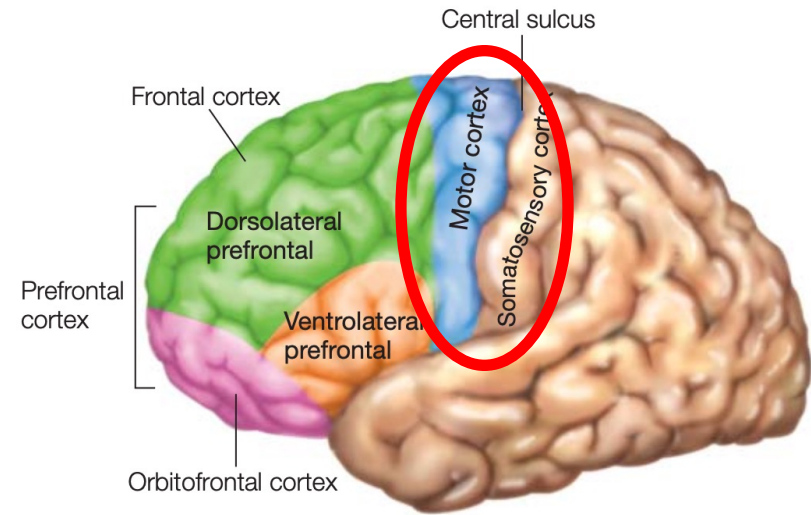


underlying image from:
 Marcel Oberländer, Beyond the Cortical Column, Neuroinformatics 2012

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Columnas de
 dominancia ocular

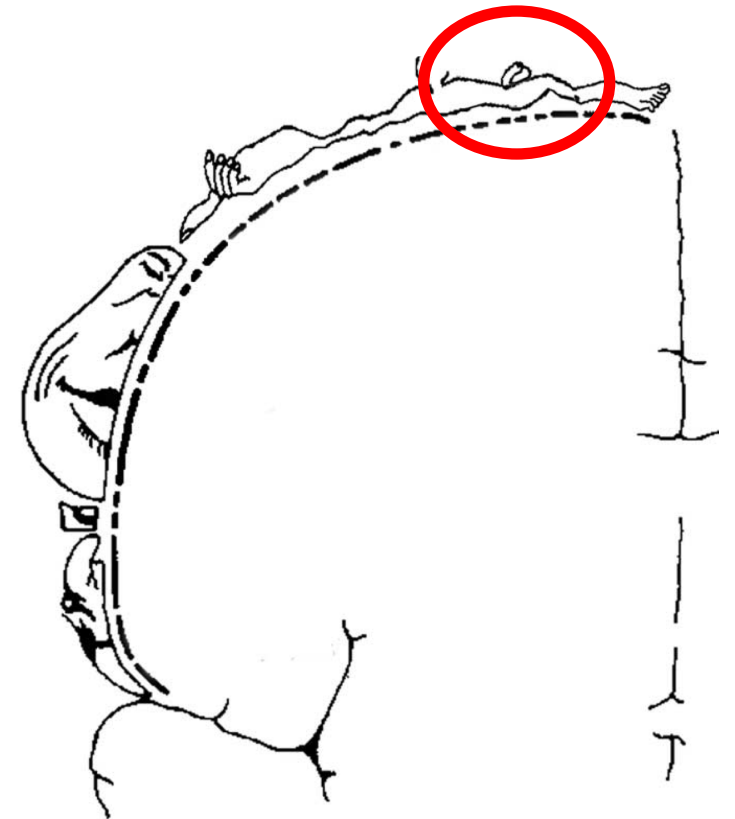
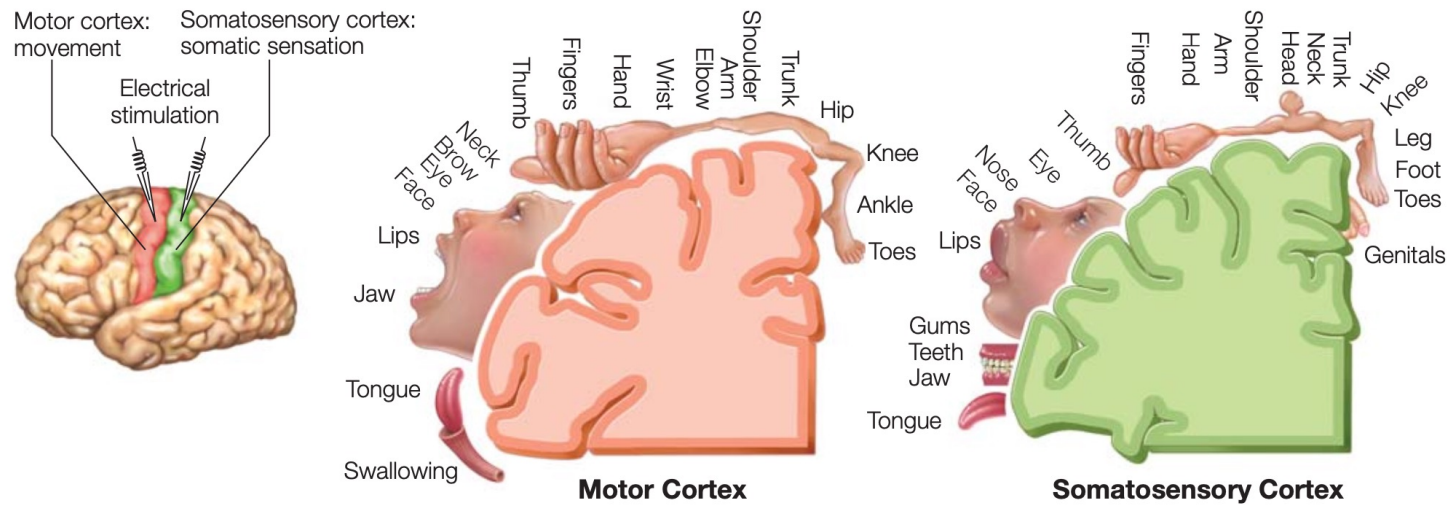


Brief Communication

The Sensory Cortical Representation of the Human Penis: Revisiting Somatotopy in the Male Homunculus

Christian A. Kell,^{1,2} Katharina von Kriegstein,^{1,2} Alexander Rösler,³ Andreas Kleinschmidt,^{1,2} and Helmut Laufs^{1,2}

¹Brain Imaging Center and ²Department of Neurology, Johann Wolfgang Goethe University, 60590 Frankfurt, Germany, and ³Albertinen Haus Geriatric Center, Department of Geriatrics and Gerontology, University of Hamburg, 22459 Hamburg, Germany

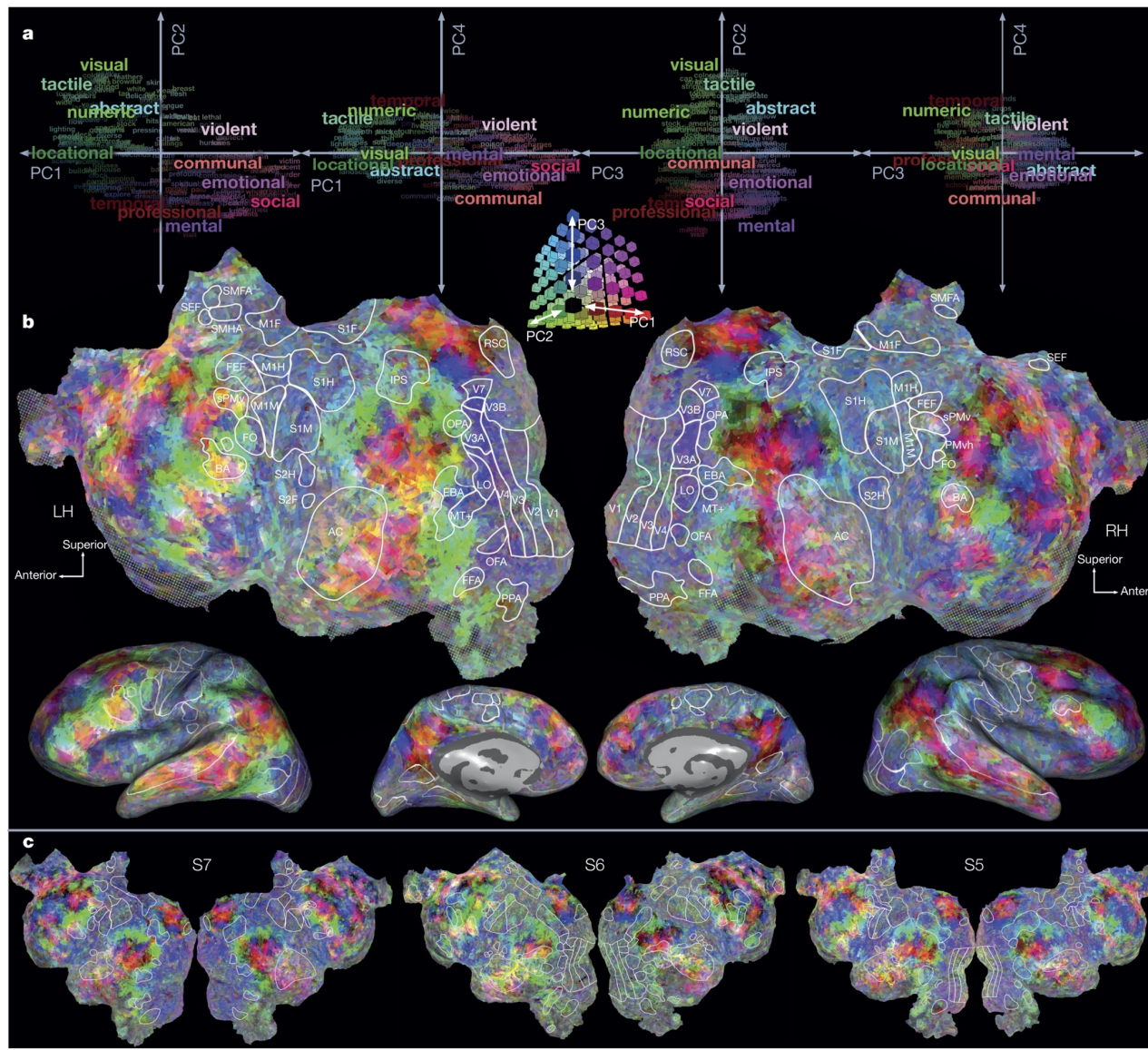
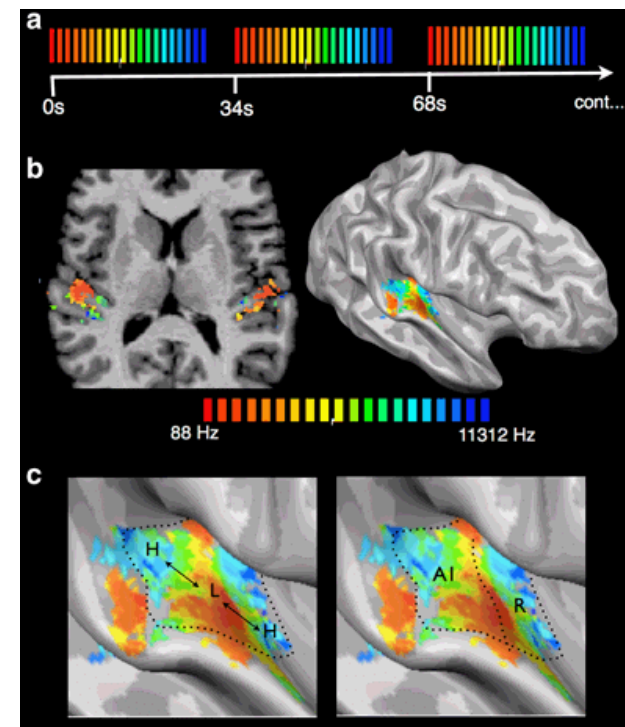
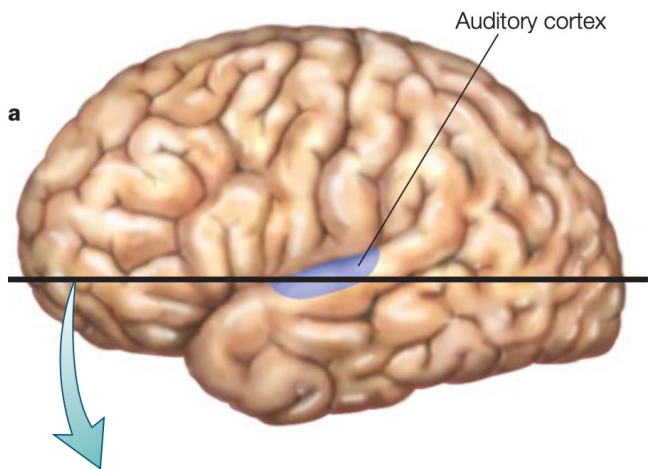


Natural speech reveals the semantic maps that tile human cerebral cortex

Alexander G. Huth, Wendy A. de Heer, Thomas L. Griffiths, Frédéric E. Theunissen & Jack L. Gallant

[Nature](#) 532, 453–458 (2016) | [Cite this article](#)

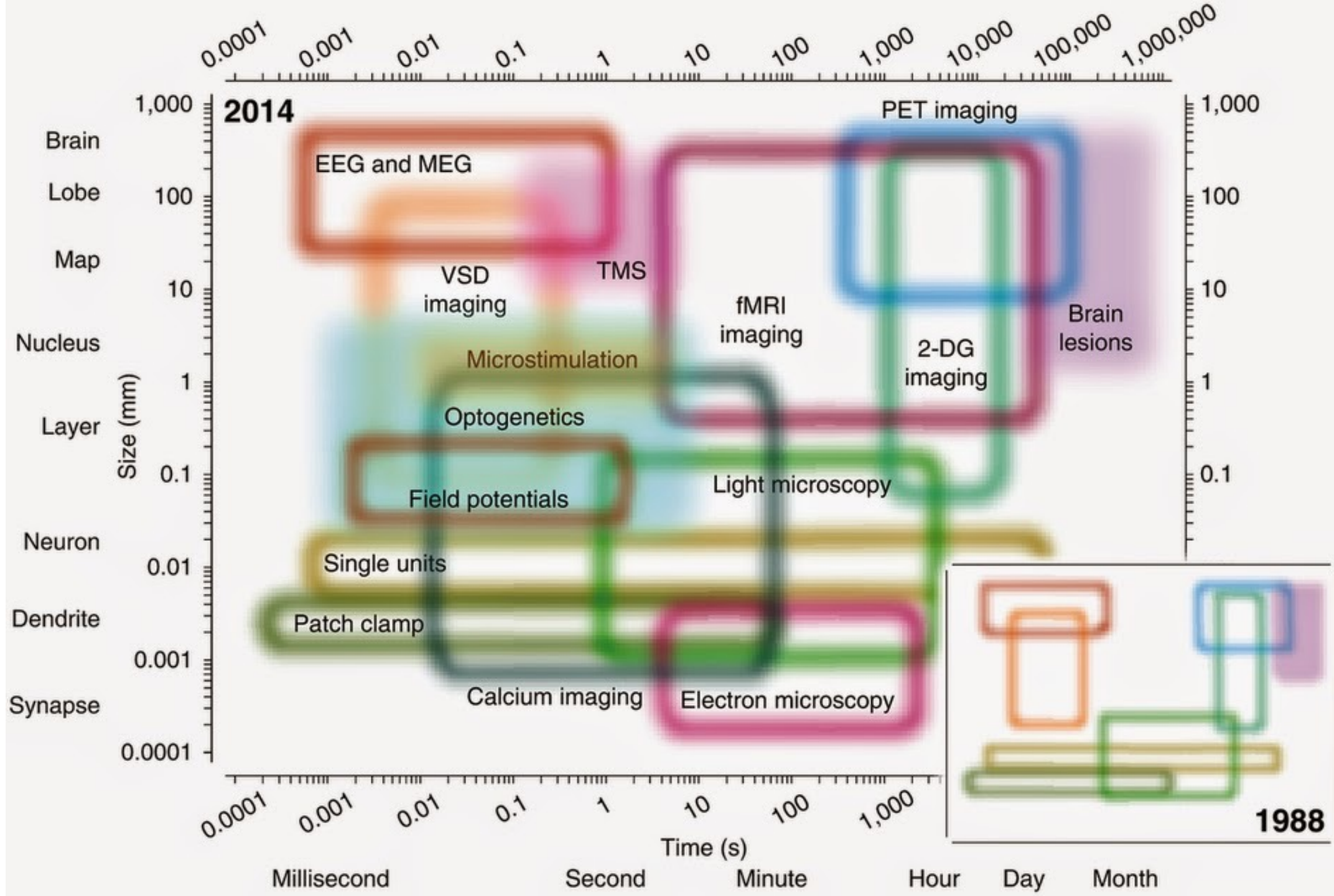
116k Accesses | 765 Citations | 1835 Altmetric | [Metrics](#)



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Métodos de la neurociencia cognitiva

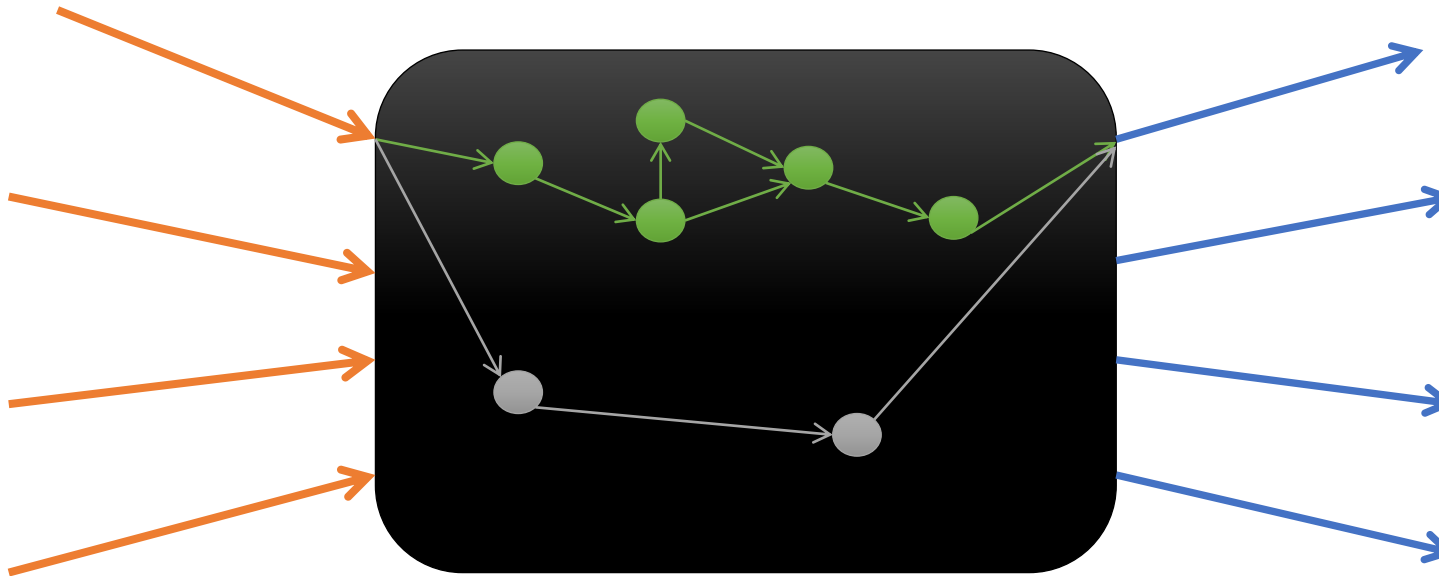


Estímulos sensoriales



Comportamiento

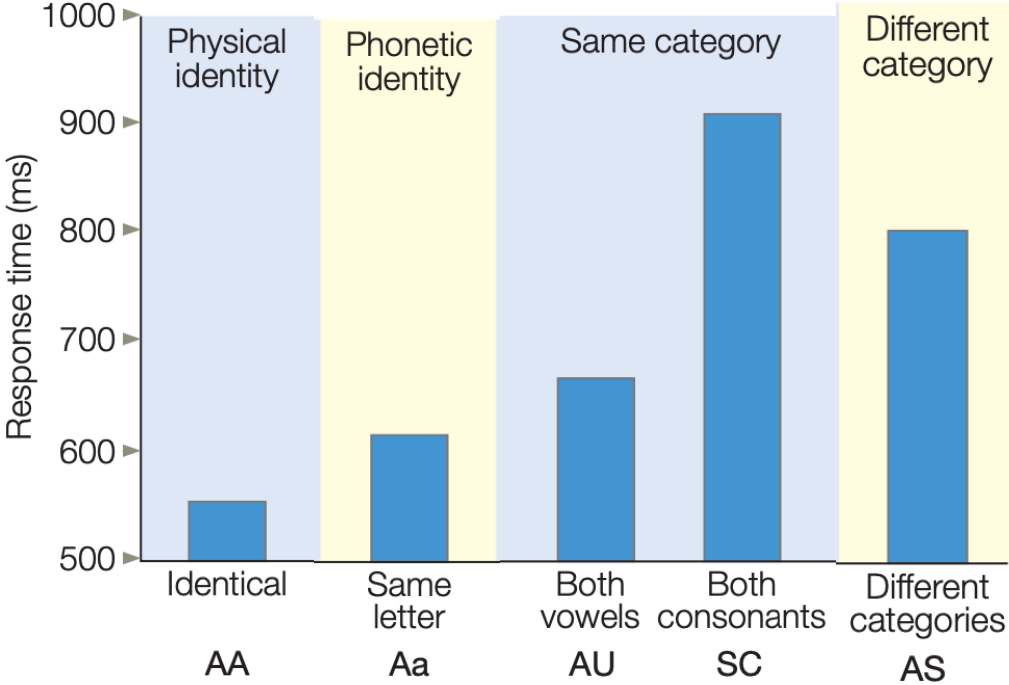
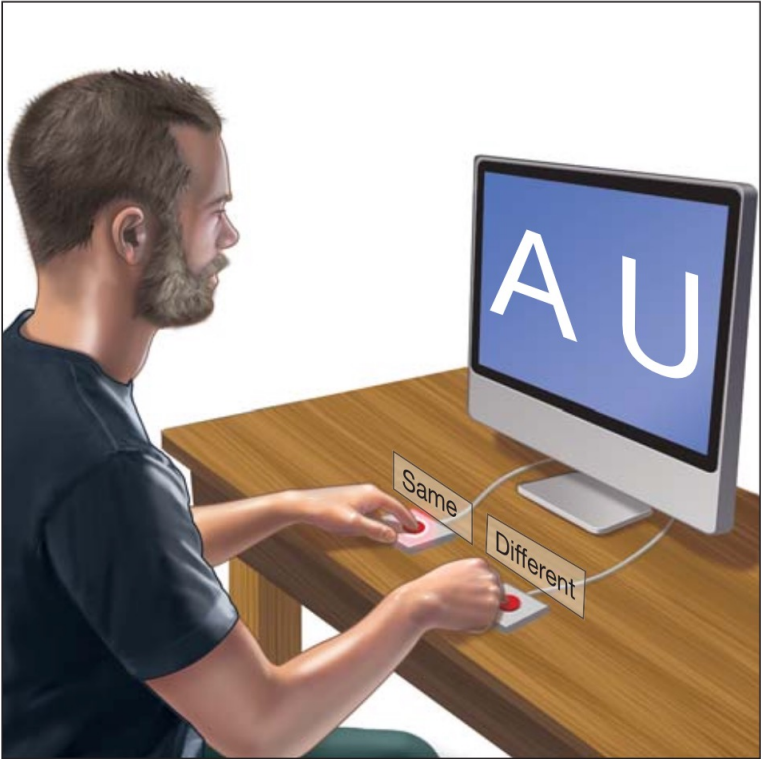
Estímulos sensoriales



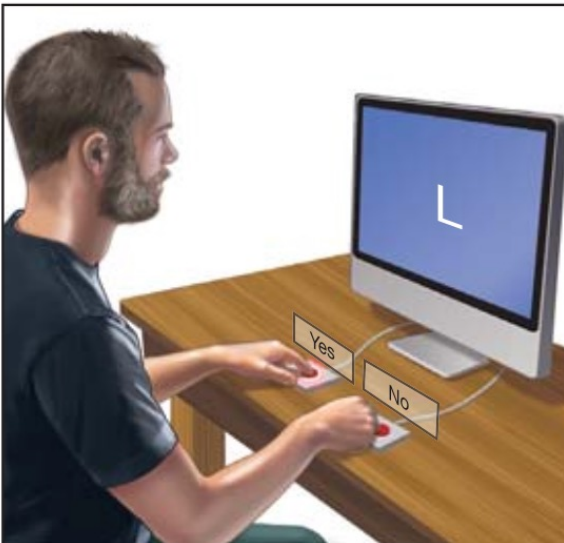
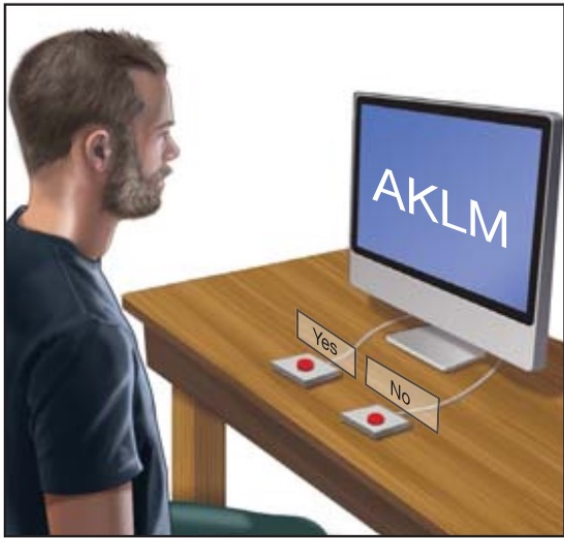
Comportamiento

Psicología cognitiva y comportamiento

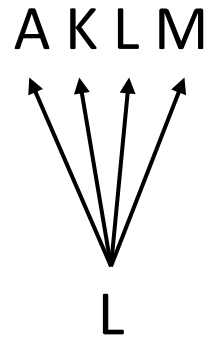
- 1. ¿Cómo se representa la información?
- 2. ¿Cómo se transforman las representaciones?



t (identidad física) < t (identidad fonética) < < t (categoría)

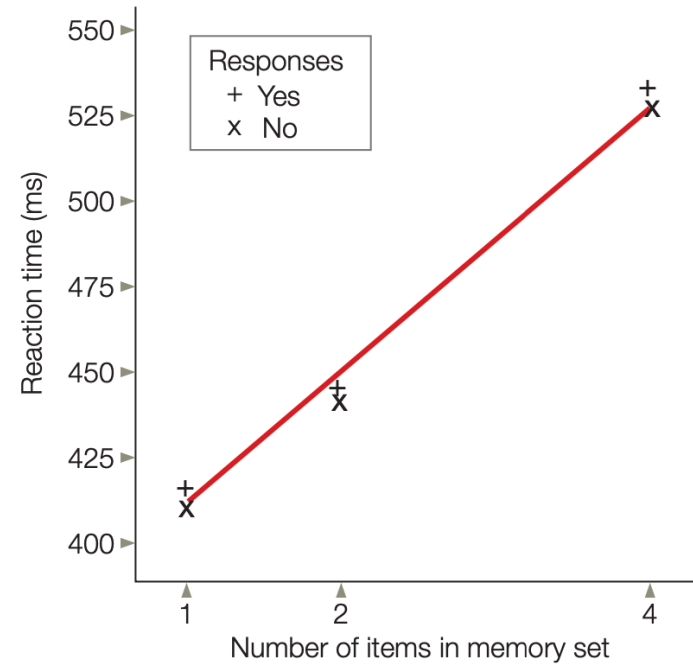
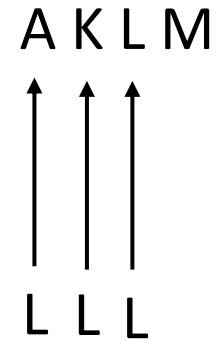


Paralelo



Vs.

Serial



Sternberg et al.

Limites al procesamiento 1: Efecto Stroop

RED	XXXXX	GREEN
GREEN	XXXXX	BLUE
RED	XXXXX	RED
BLUE	XXXXX	BLUE
BLUE	XXXXX	GREEN
GREEN	XXXXX	RED
BLUE	XXXXX	GREEN
RED	XXXXX	BLUE

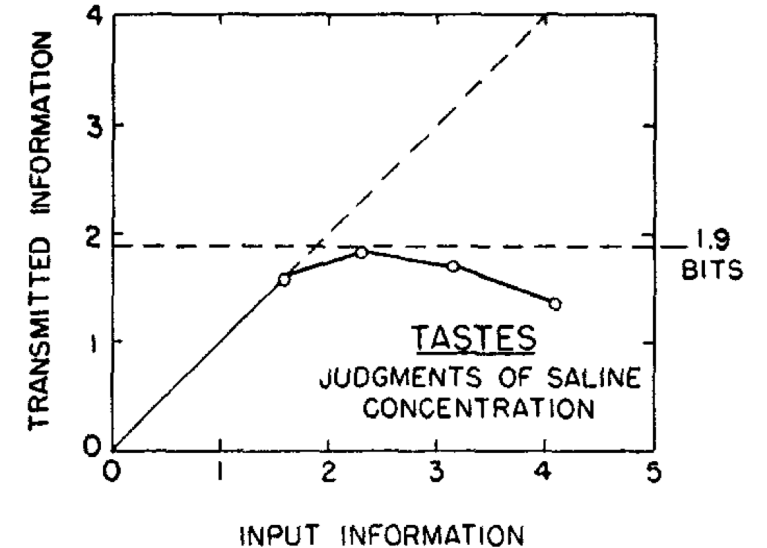
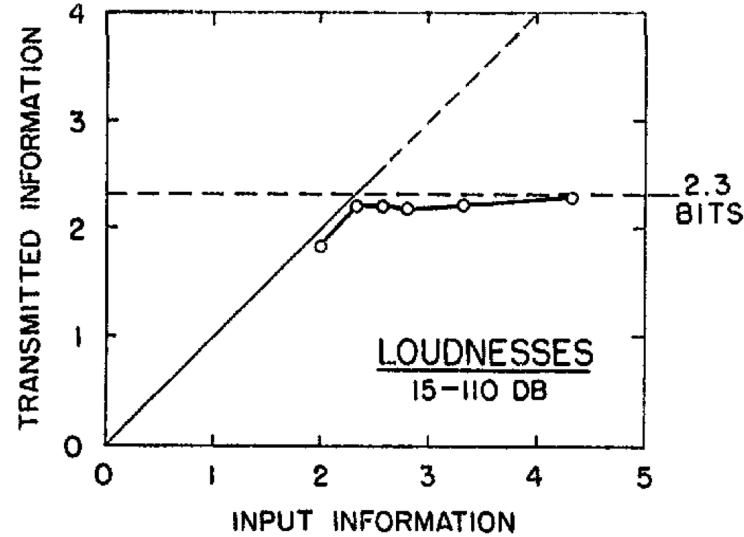
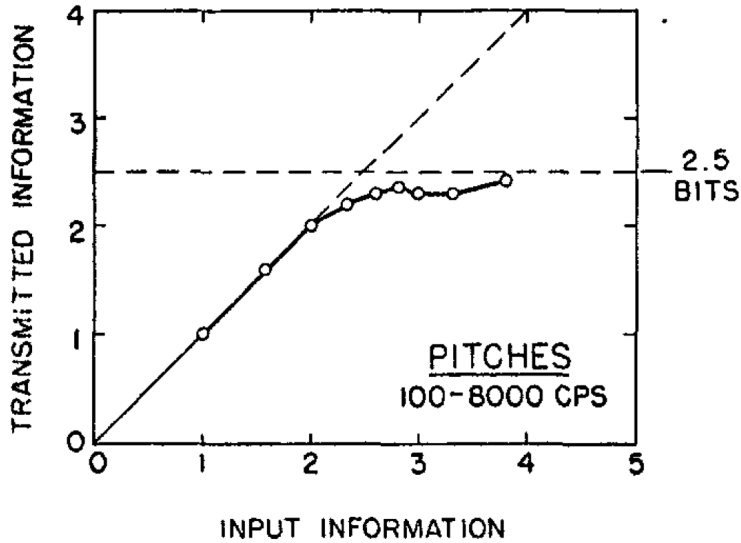
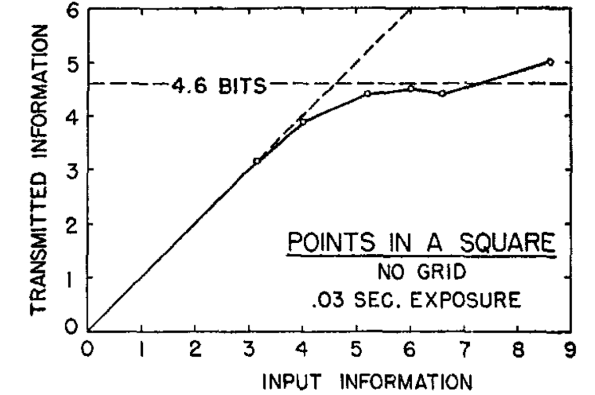
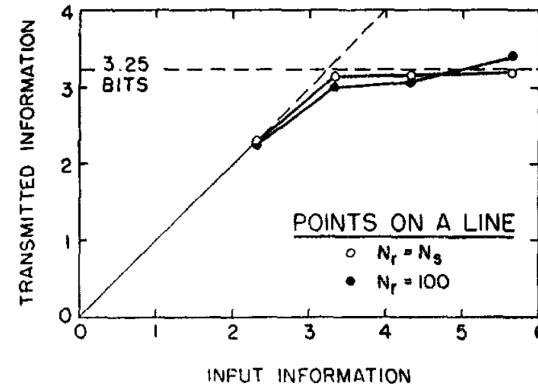
Representación palabras ~ respuesta vocal

Límites al procesamiento 2: Memoria de trabajo

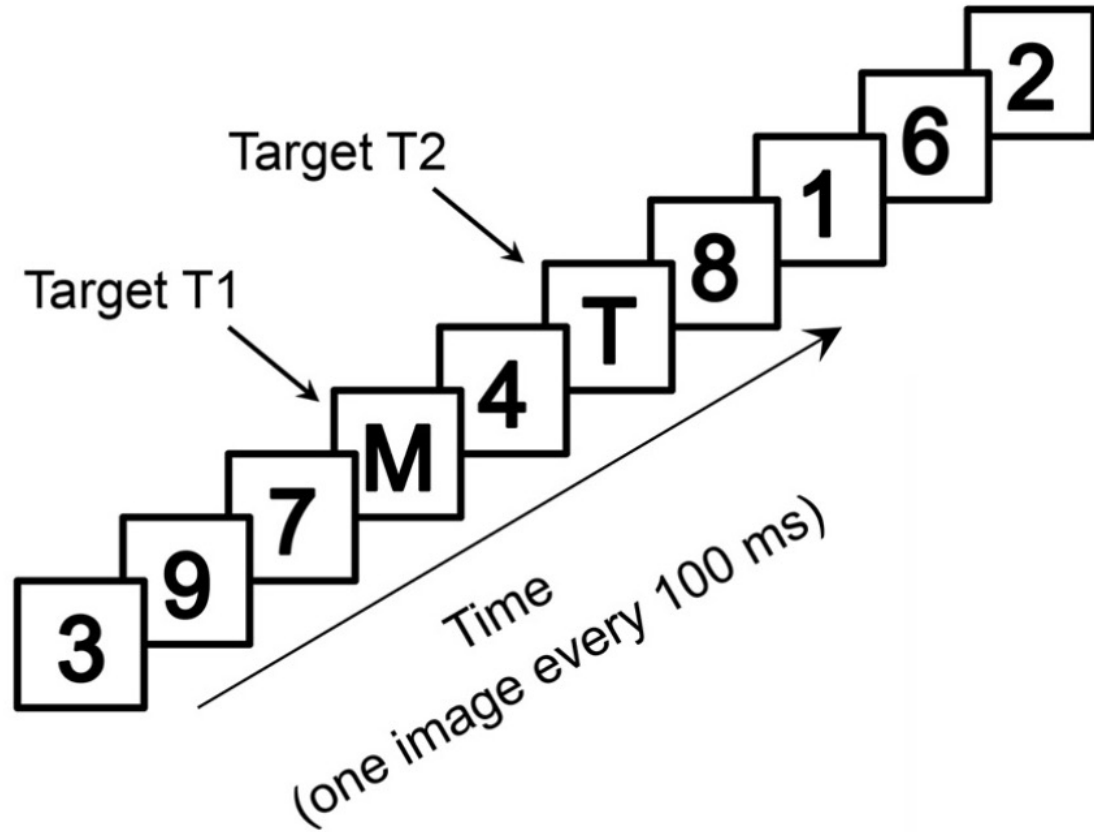
THE PSYCHOLOGICAL REVIEW

THE MAGICAL NUMBER SEVEN, PLUS OR MINUS TWO: SOME LIMITS ON OUR CAPACITY FOR PROCESSING INFORMATION¹

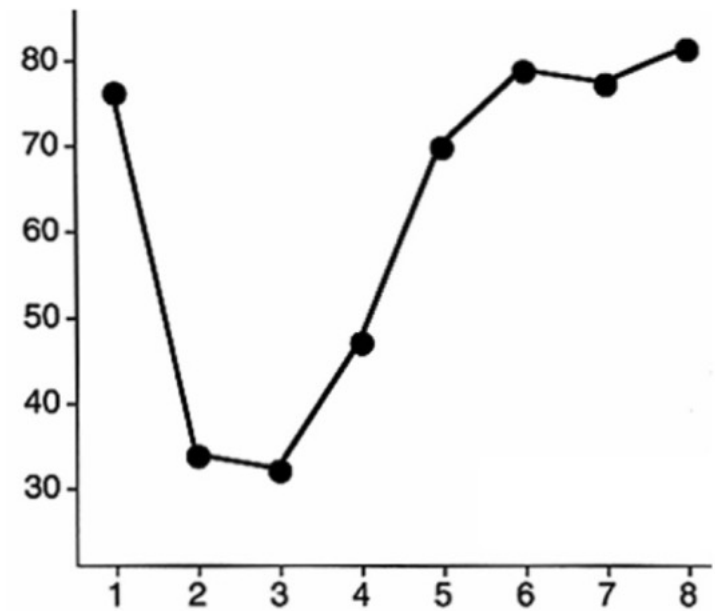
GEORGE A. MILLER
Harvard University



Límites al procesamiento 3: Periodo refractario atencional

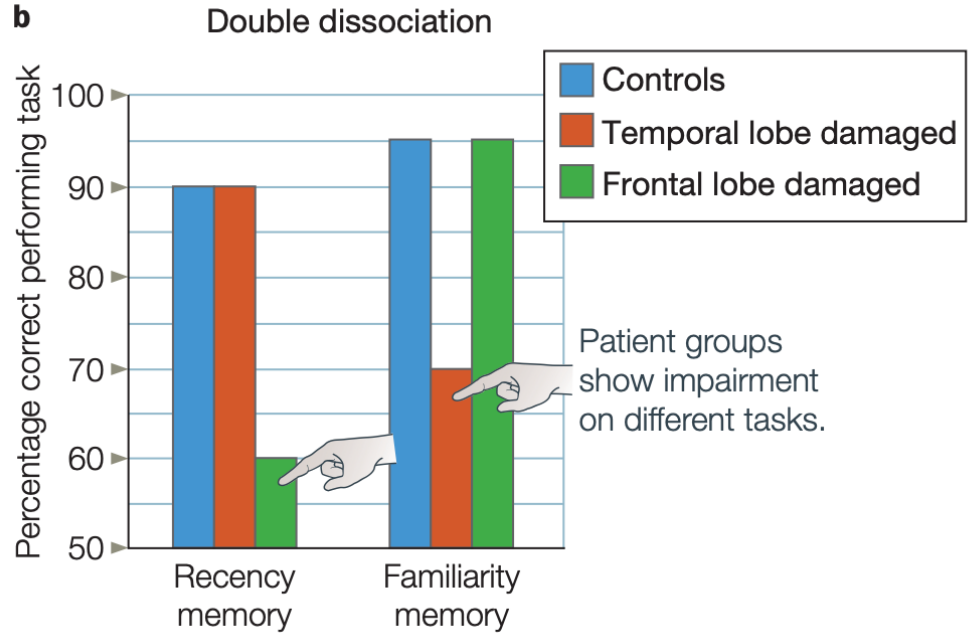
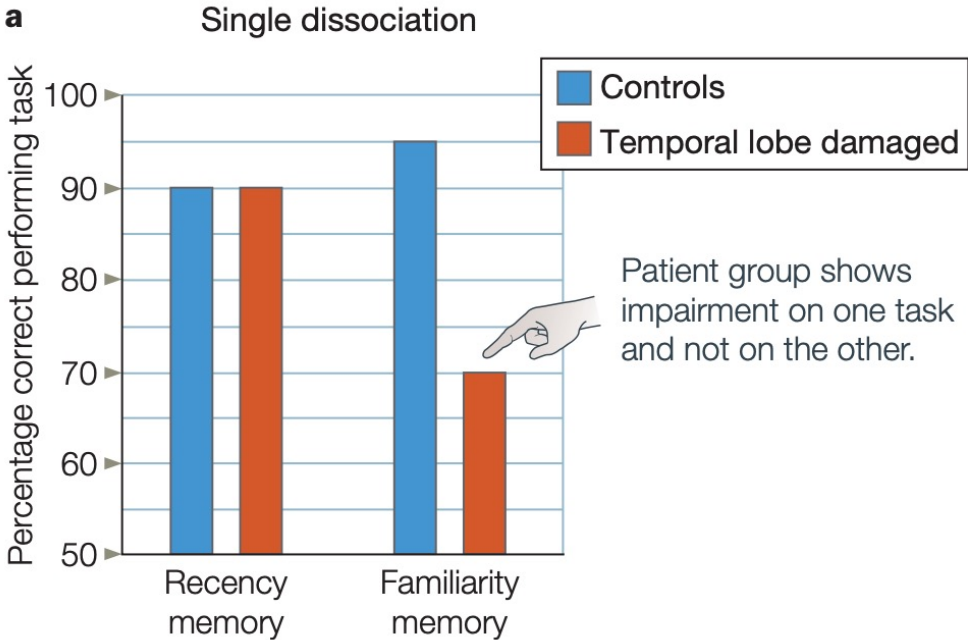
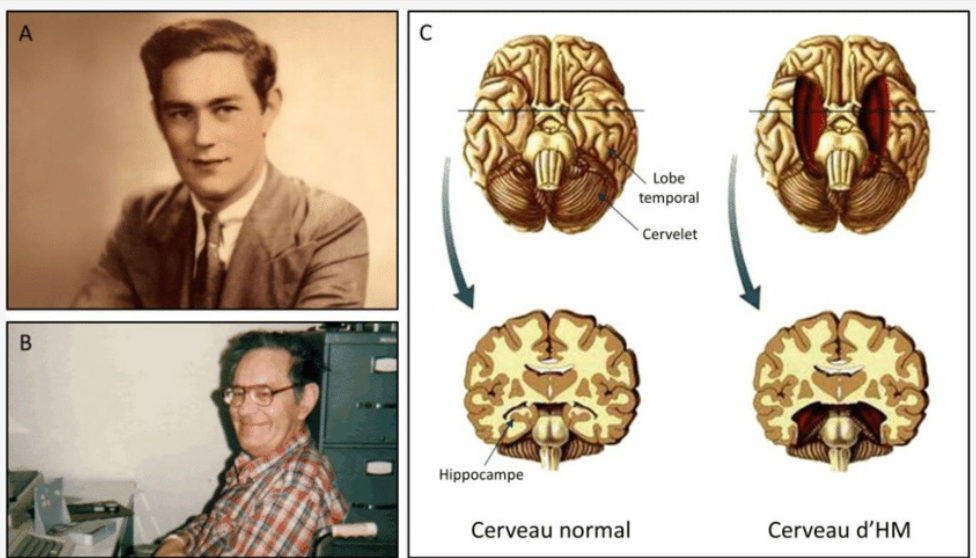


Visibility of target T2 (% seen)



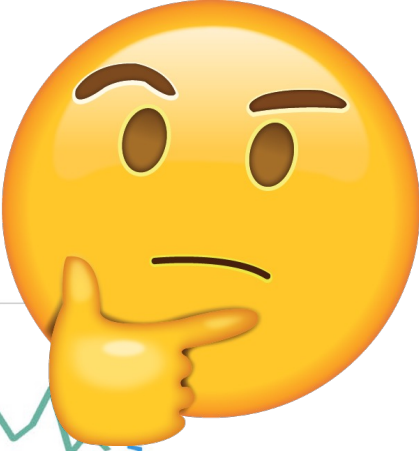
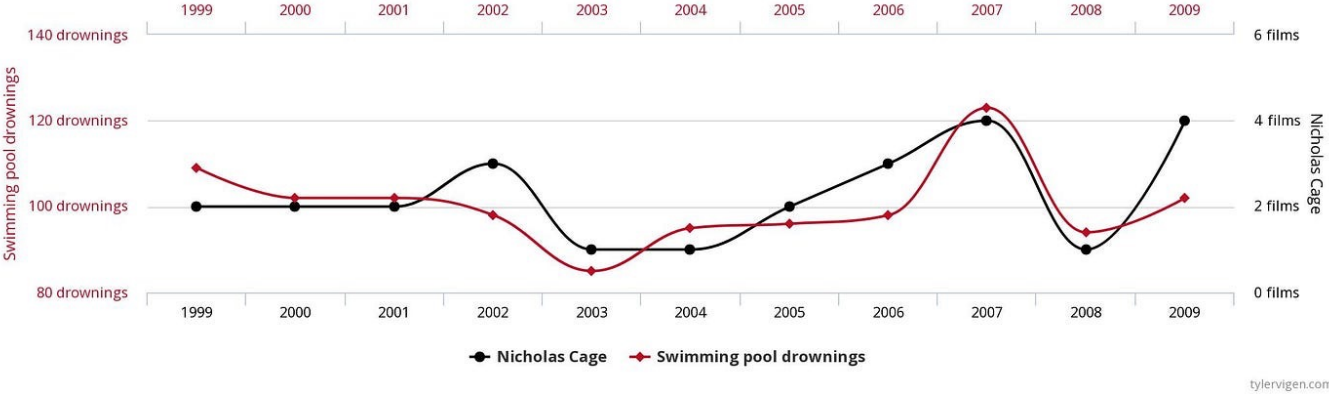
Lag between targets T1 and T2 (steps of 100 ms)

Estudios de lesiones



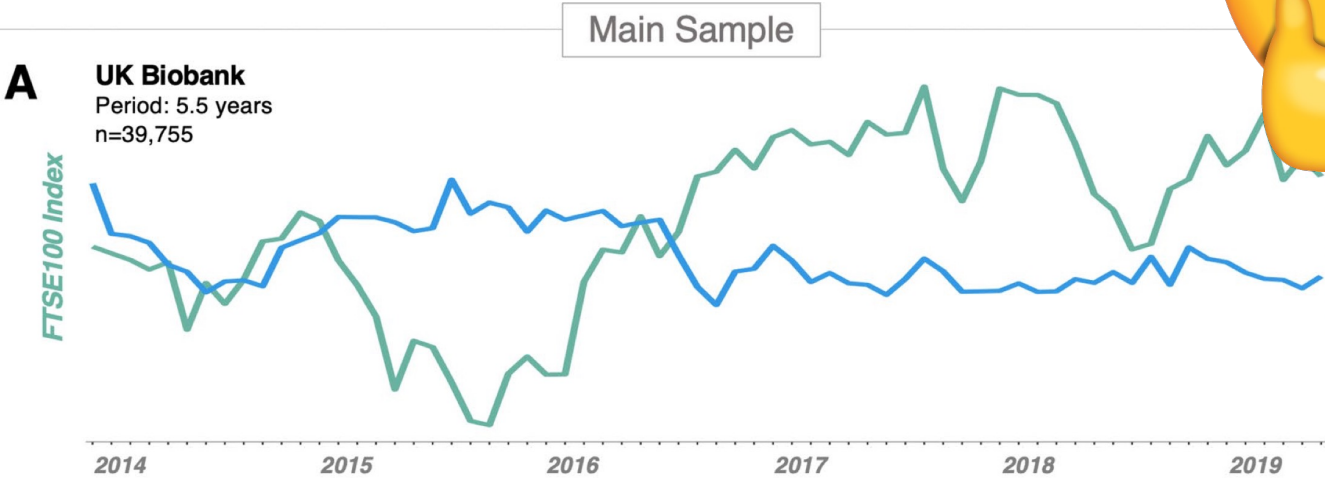
Correlación vs. causalidad

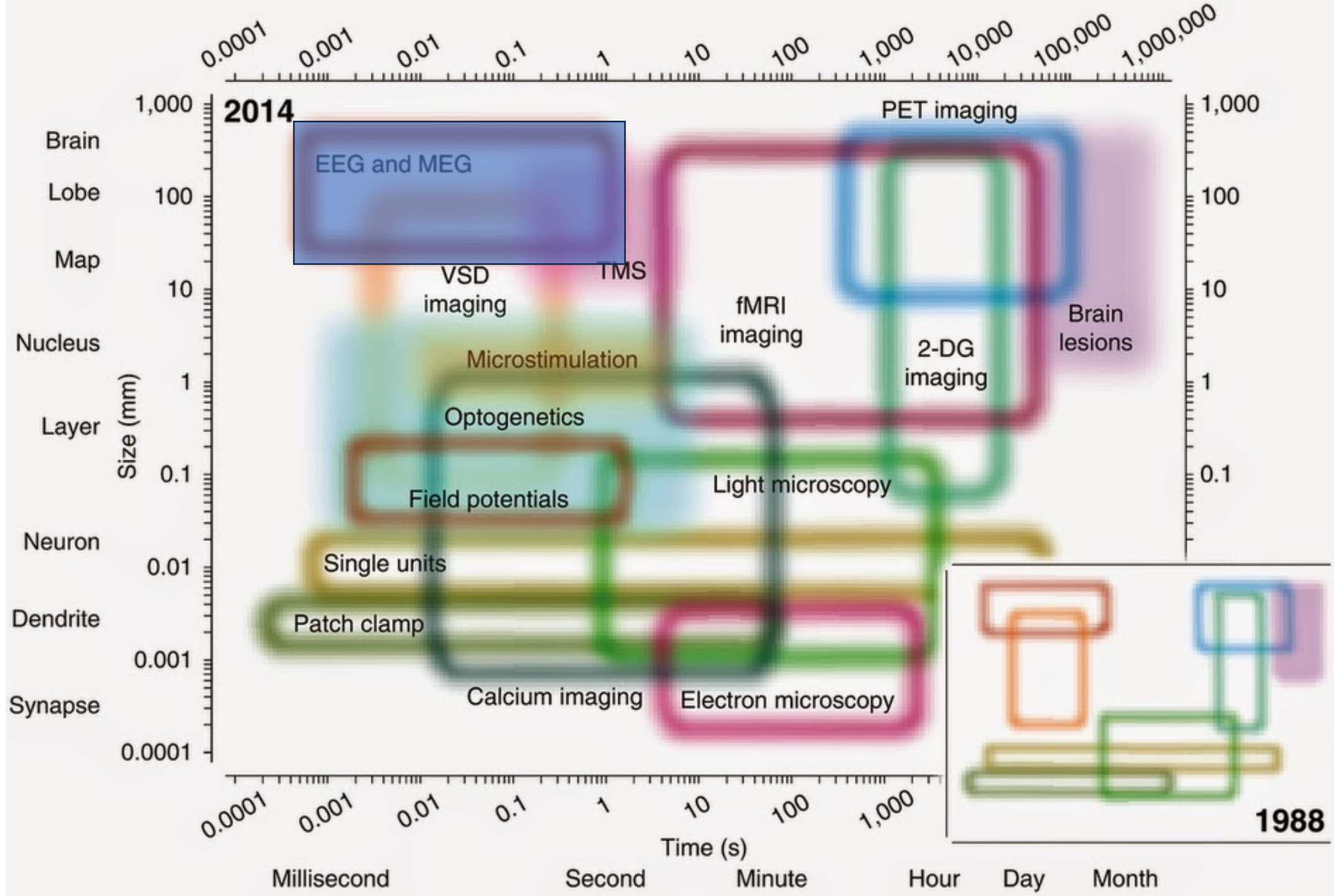
Number of people who drowned by falling into a pool
correlates with
Films Nicolas Cage appeared in

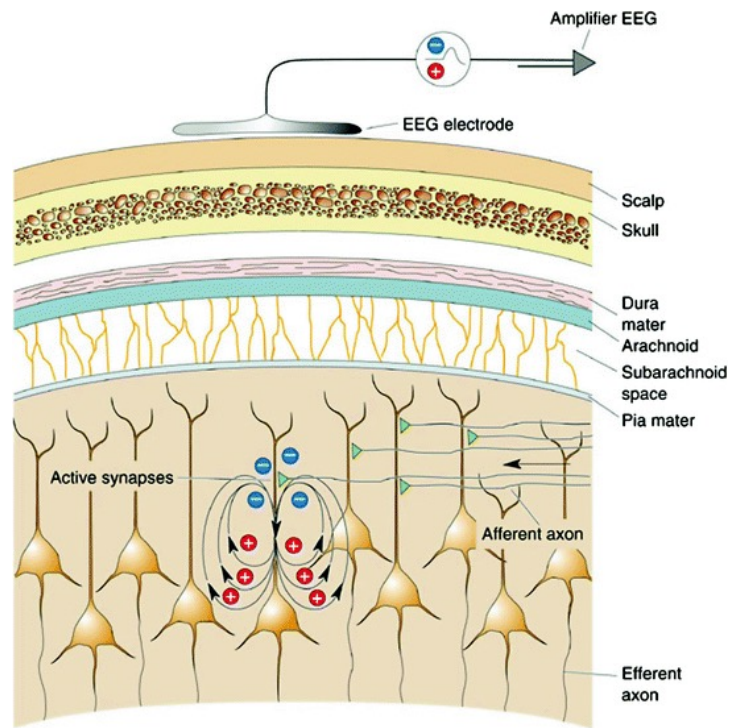
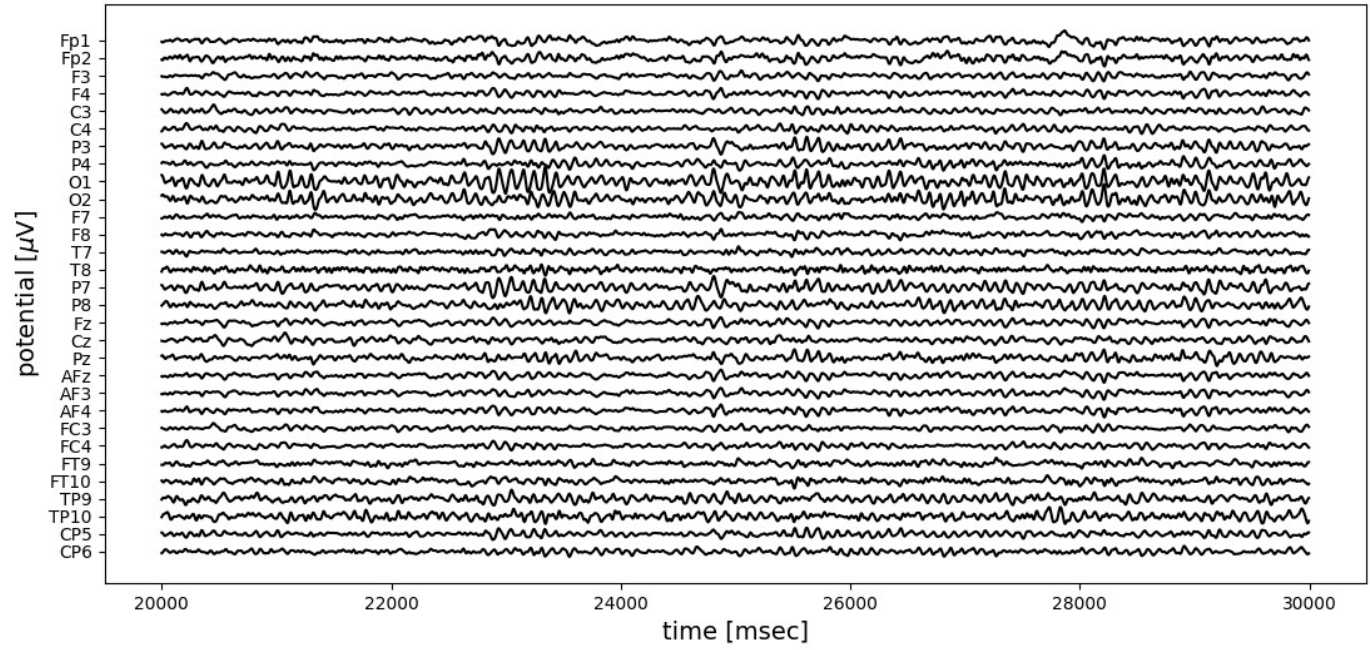


OPEN Large-scale societal dynamics are reflected in human mood and brain

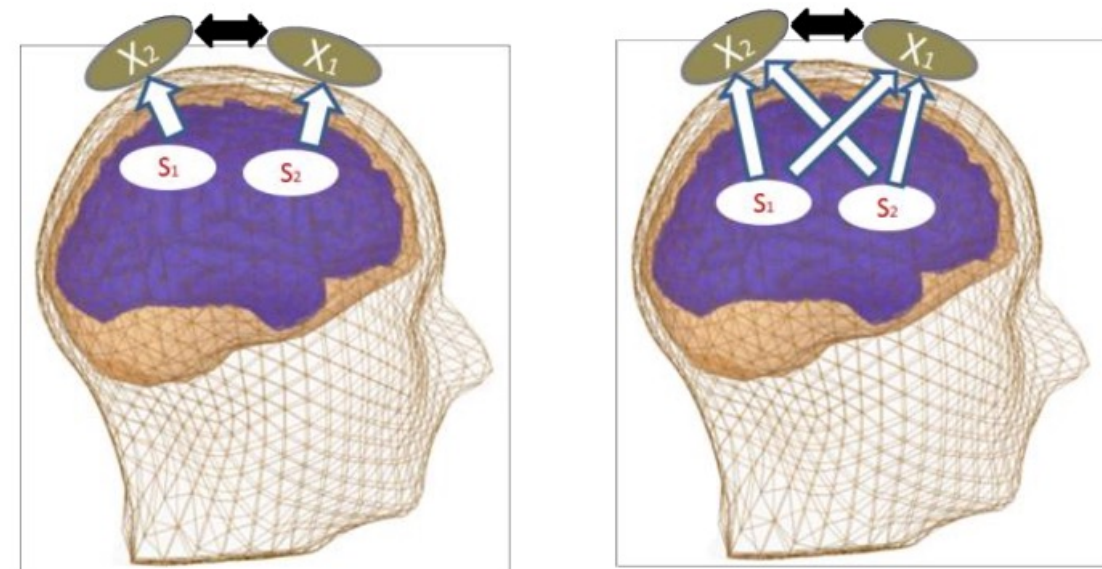
Alexander V. Lebedev^{1,2,3}, Christoph Abé¹, Kasim Acar¹, Gustavo Deco^{3,4}, Morten L. Kringelbach^{5,6,7}, Martin Ingvar¹ & Predrag Petrovic^{1,2}



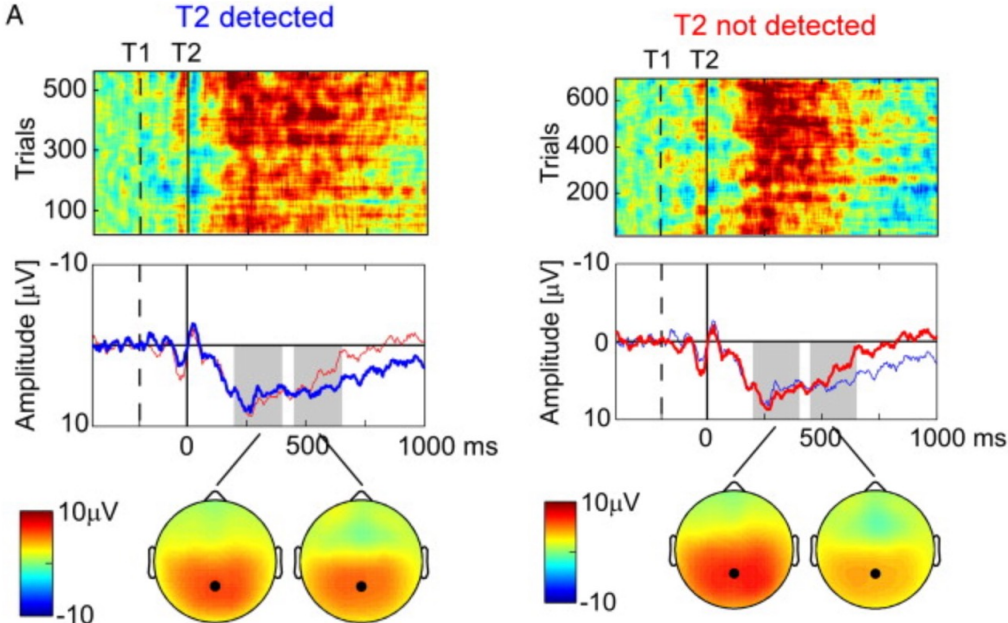
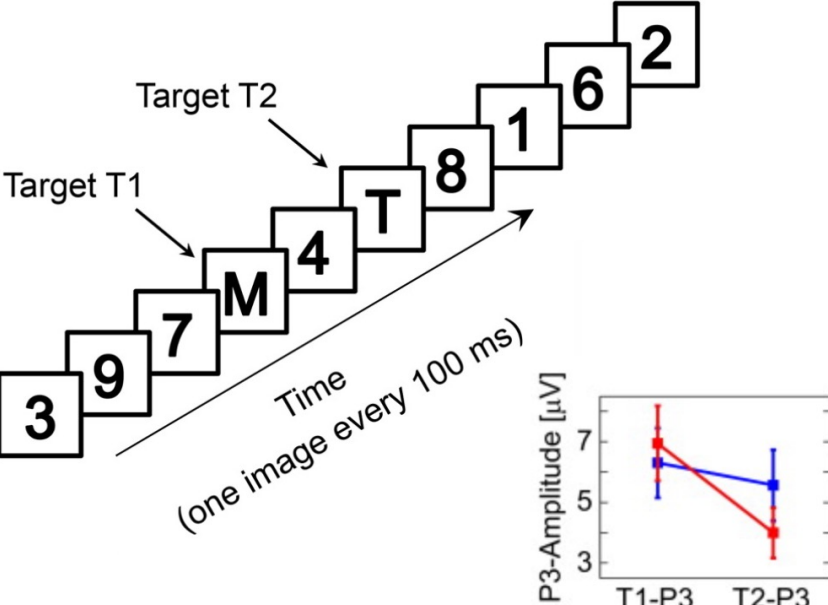
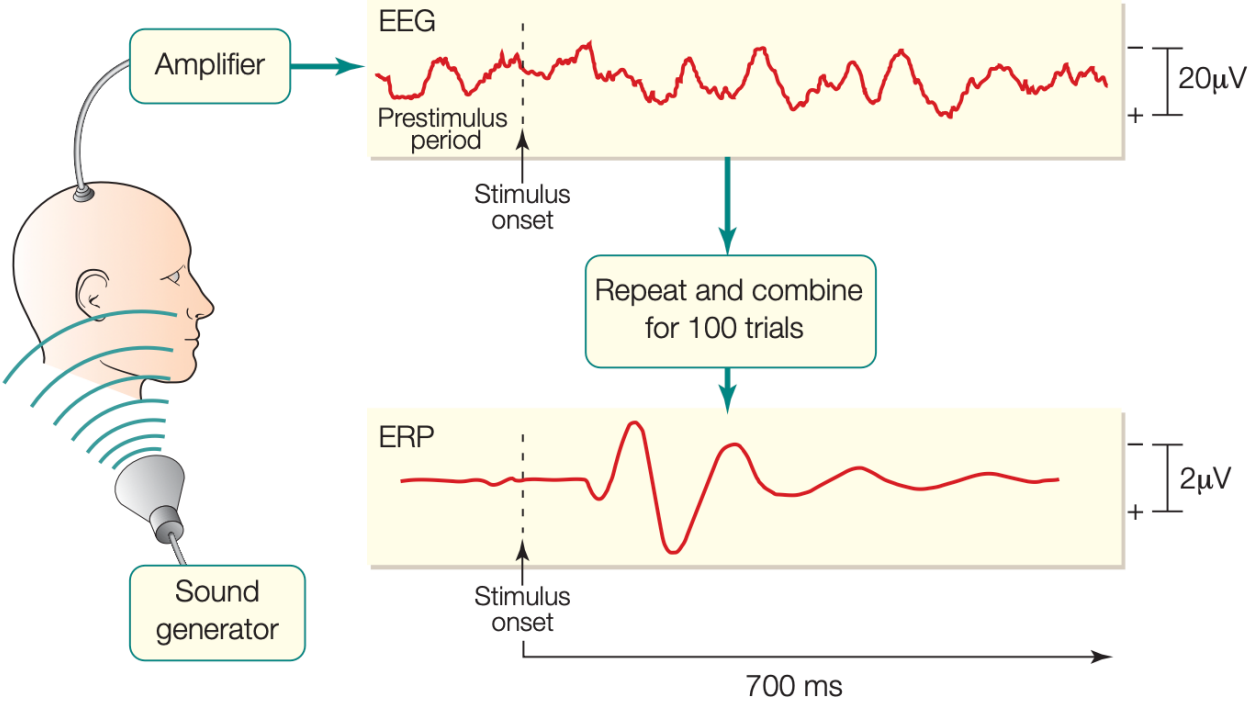


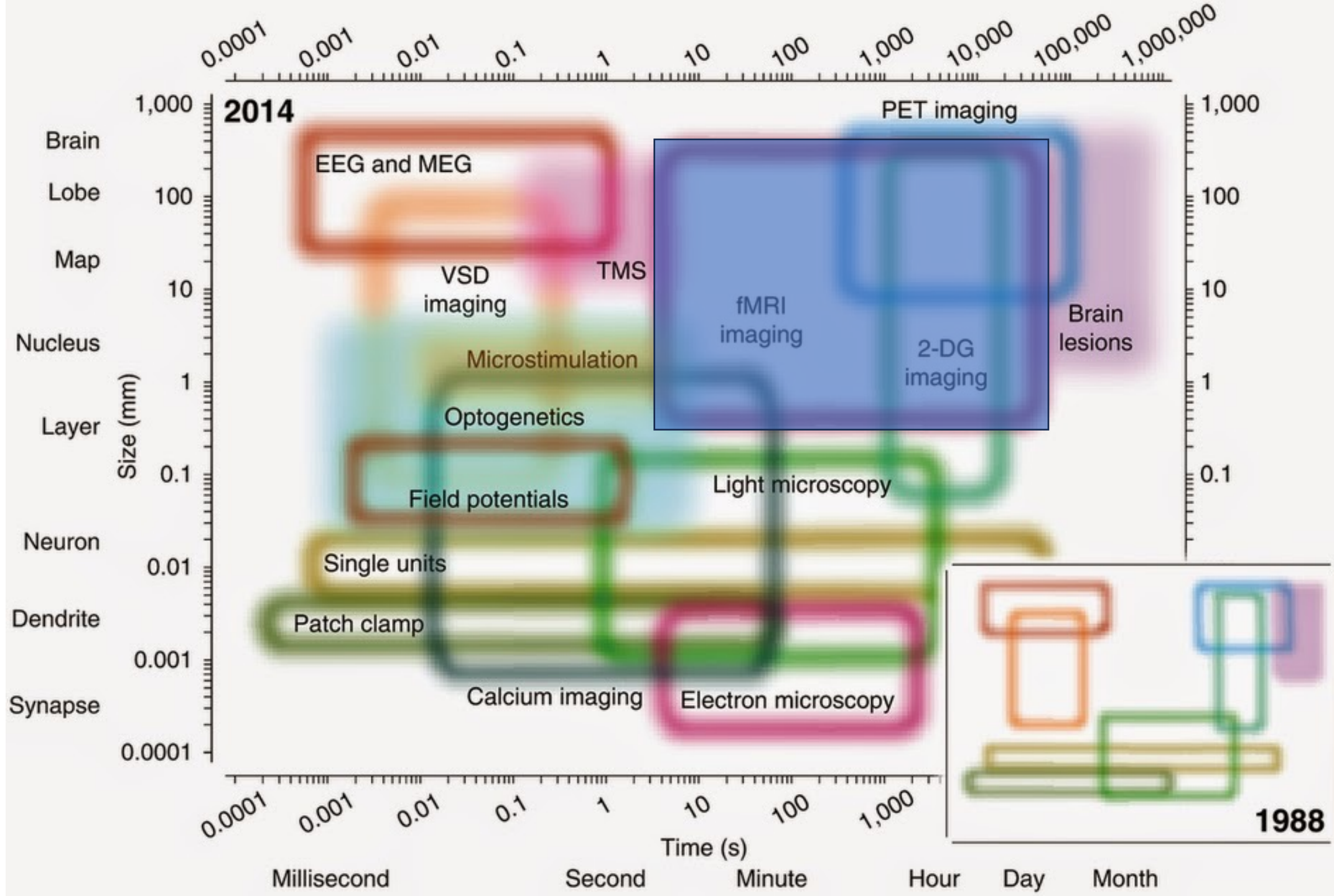


Conducción de volumen

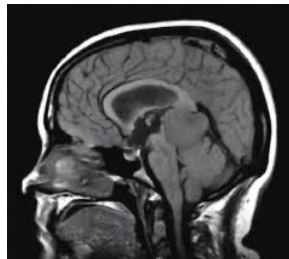
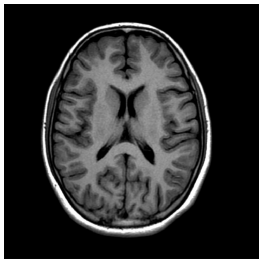


EEG- potenciales evocados





Resonancia magnética (funcional)



articles

Neurophysiological investigation of the basis of the fMRI signal

Nikos K. Logothetis, Jon Pauls, Mark Augath, Torsten Trinath & Axel Oeltermann

Max Planck Institute for Biological Cybernetics, Spemannstrasse 38, 72076 Tuebingen, Germany

