Dinámica de los desplazamientos realizados por las poblaciones celulares durante el desarrollo del Telencéfalo en mamíferos

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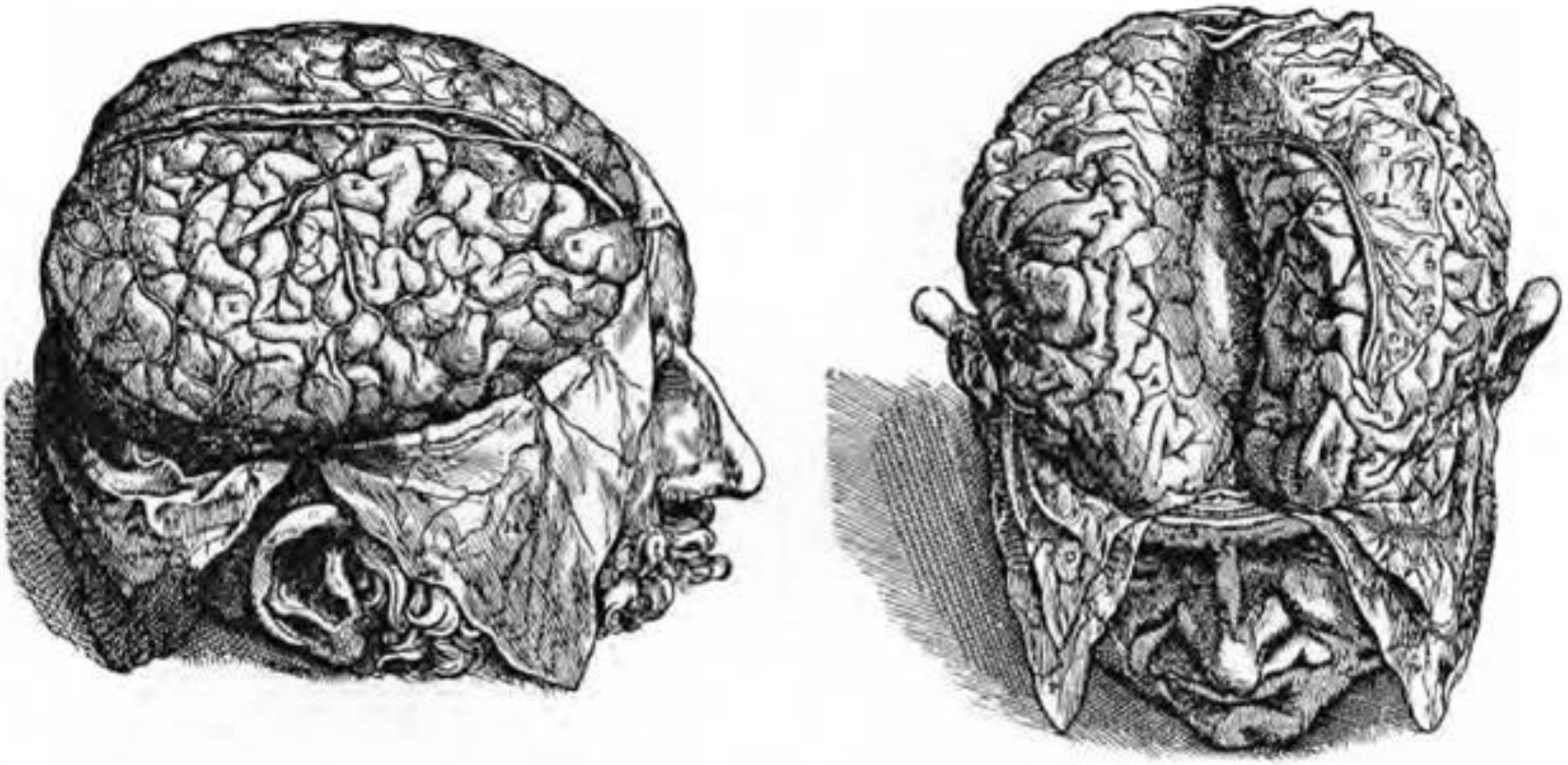
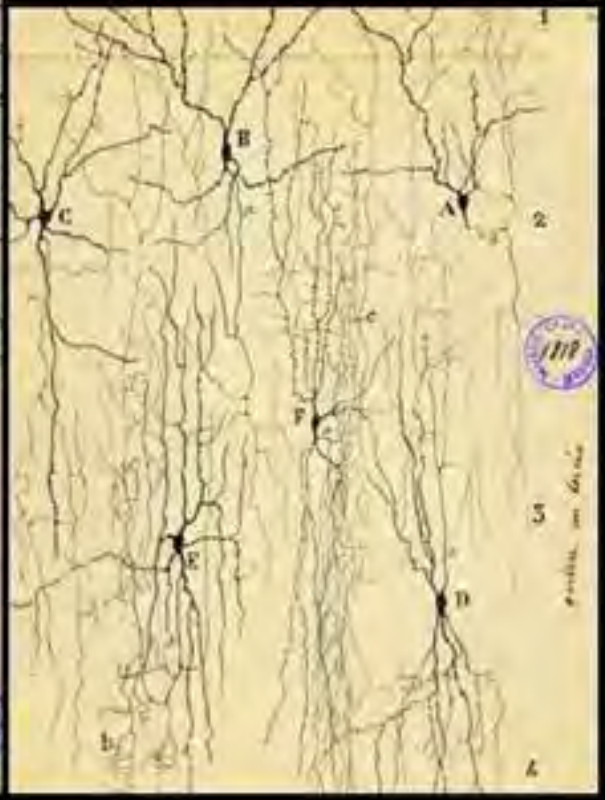
INSTITUTO CAJAL

La Corteza Cerebral Humana



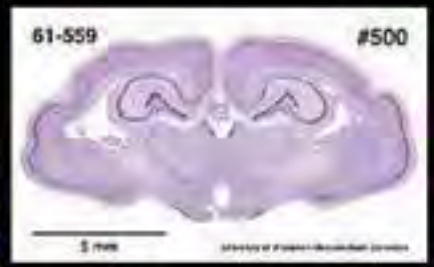
Andreas Vesalius «De Humani Corporis Fabrica» 1543

La Corteza cerebral: Tipos neuronales



Cajal

Homo

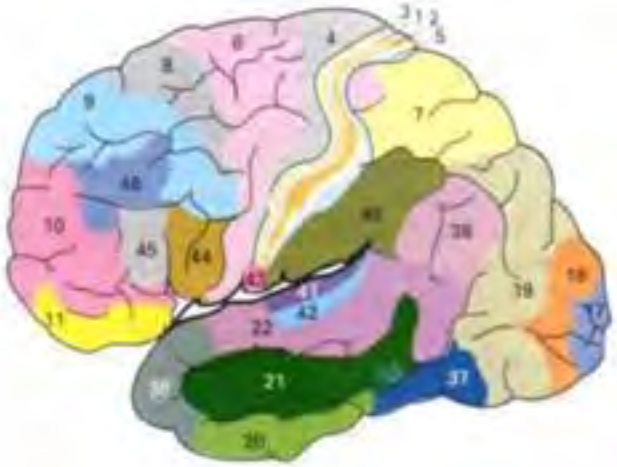


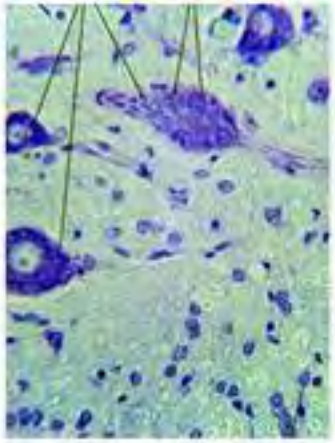
Erinaceus europaeus

La Corteza Cerebral : Variedad y Especificidad

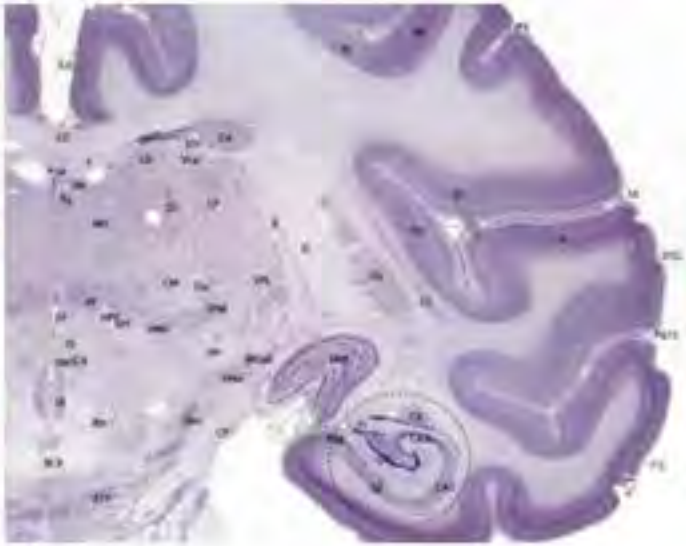
Franz Nissl
(1860-1919)

Korbinian Brodmann
(1868-1918)

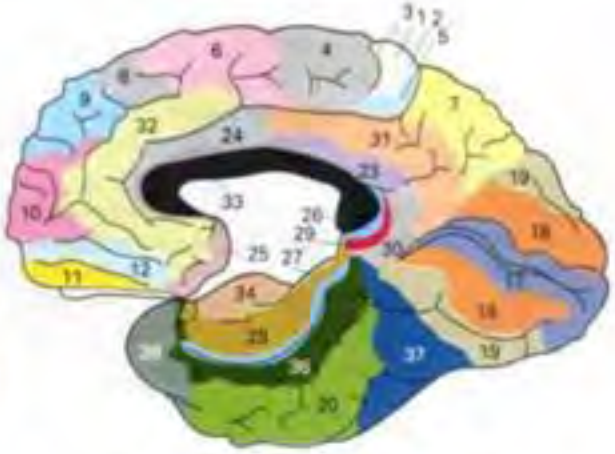




Grumos de Nissl



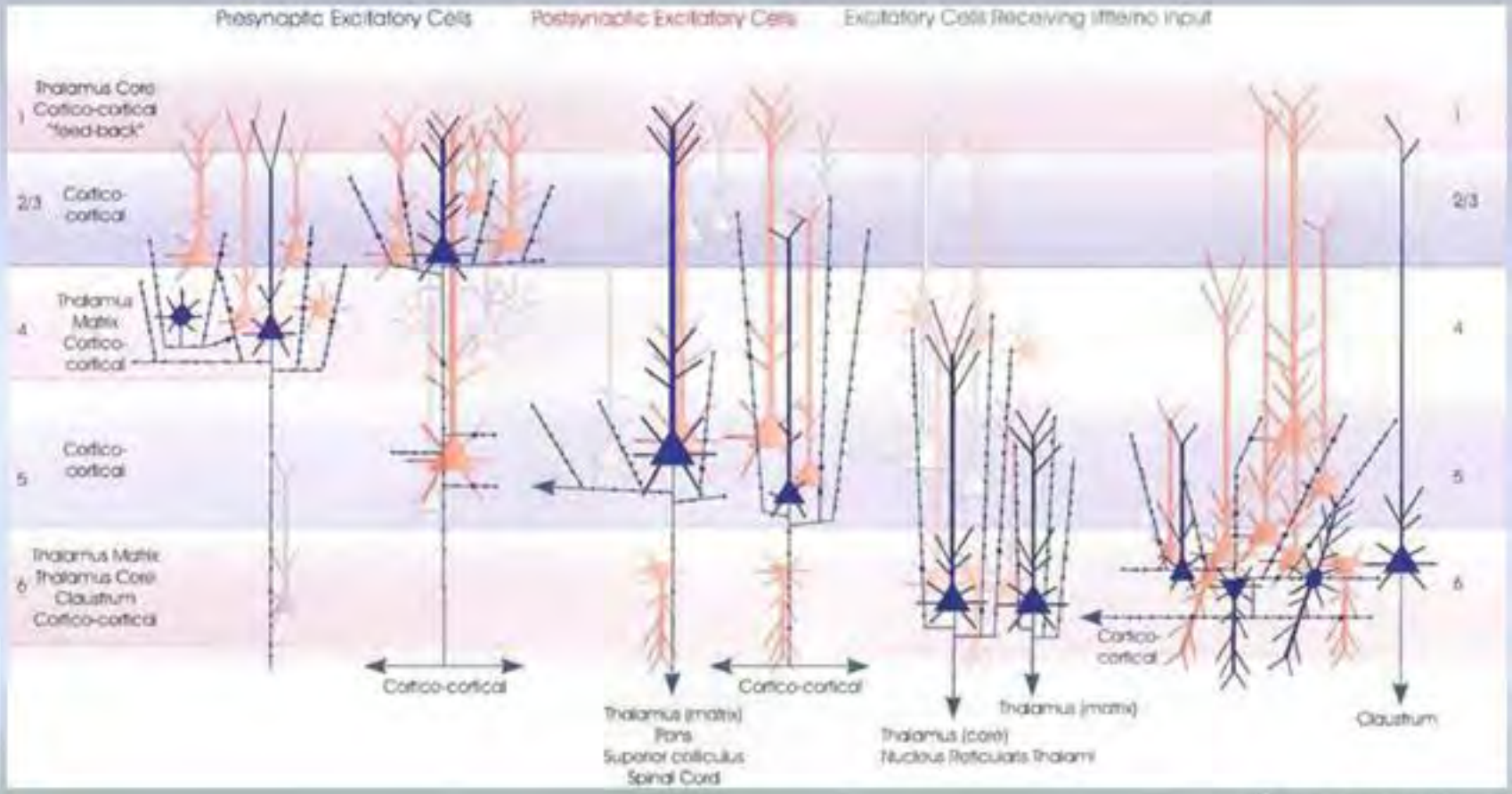
Tinción de Nissl



Mapas Corticales de Brodmann (1909)

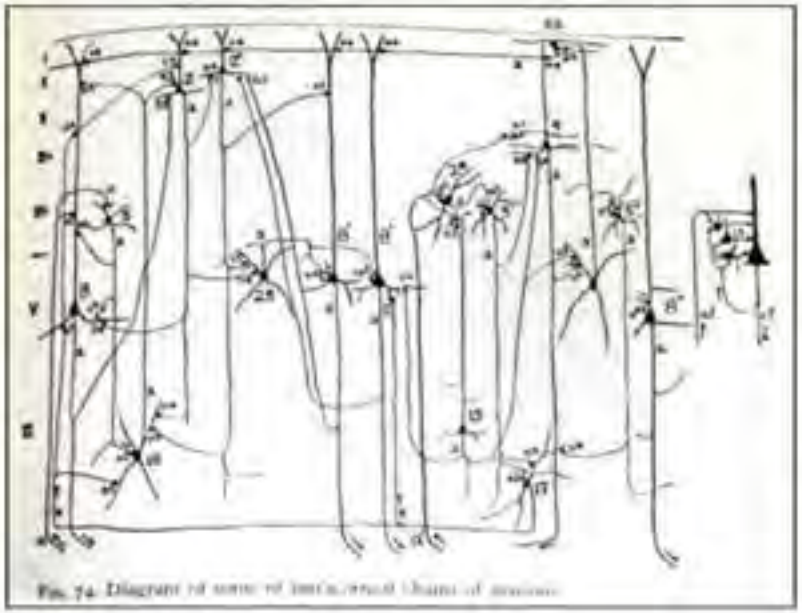
La Corteza Cerebral : Organización

La función de cualquier estructura cerebral depende de su composición neuronal y del patrón de conectividades sinápticas que presenta, tanto extrínsecas como intrínsecas, excitatorias e inhibitorias



Capas Horizontales

La Corteza Cerebral : Organización

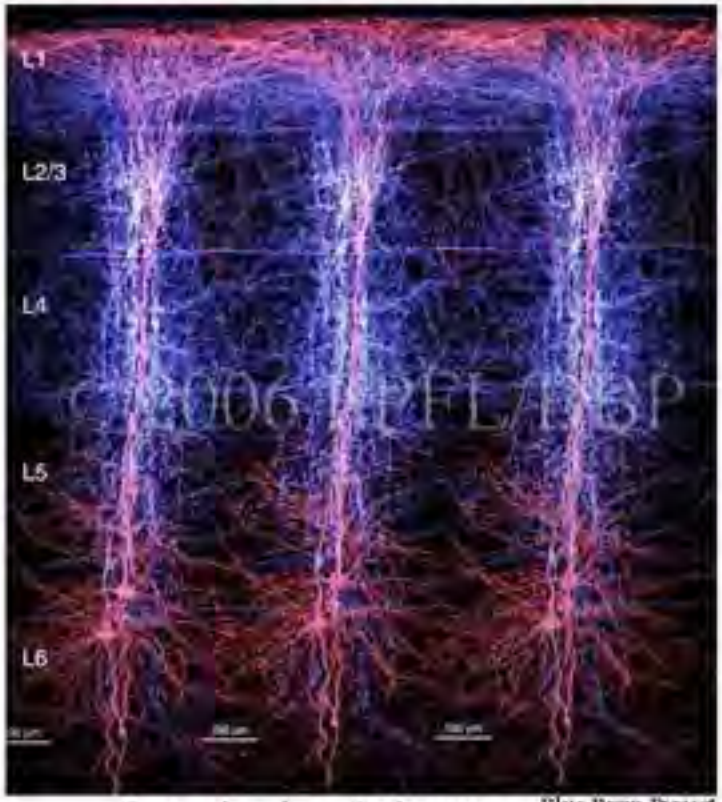


Rafael Lorente de Nó

Lorente, en 1938, introdujo la idea de que las células de la corteza cerebral estaban dispuestas en modulos verticales que podían conectarse por medio de interneuronas

Vernon Mountcastle (1957)

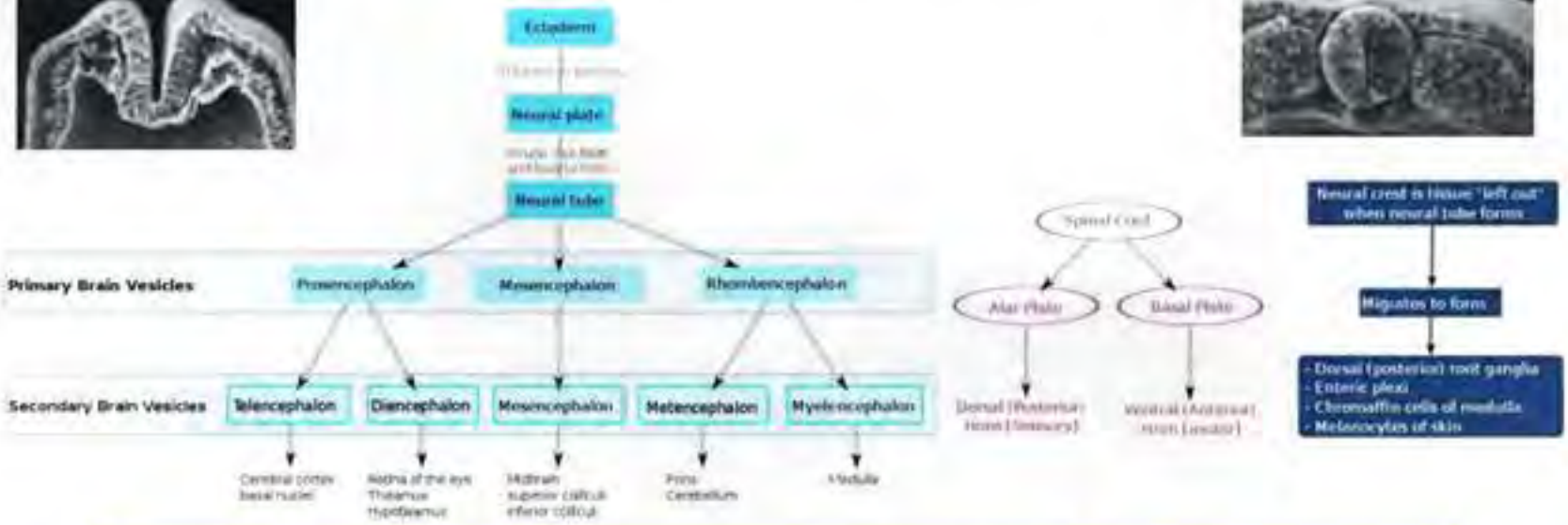
«…neurons which lie in narrow verticals columns, or cylinders, extending from layers II through layer VI make up an elementary unit of organization, for they are activated by stimulation of the same class of peripheral receptors, from almost identical peripheral receptive fields, at latencies which are not significantly different for the cells of the various layers»



Organization Columnar

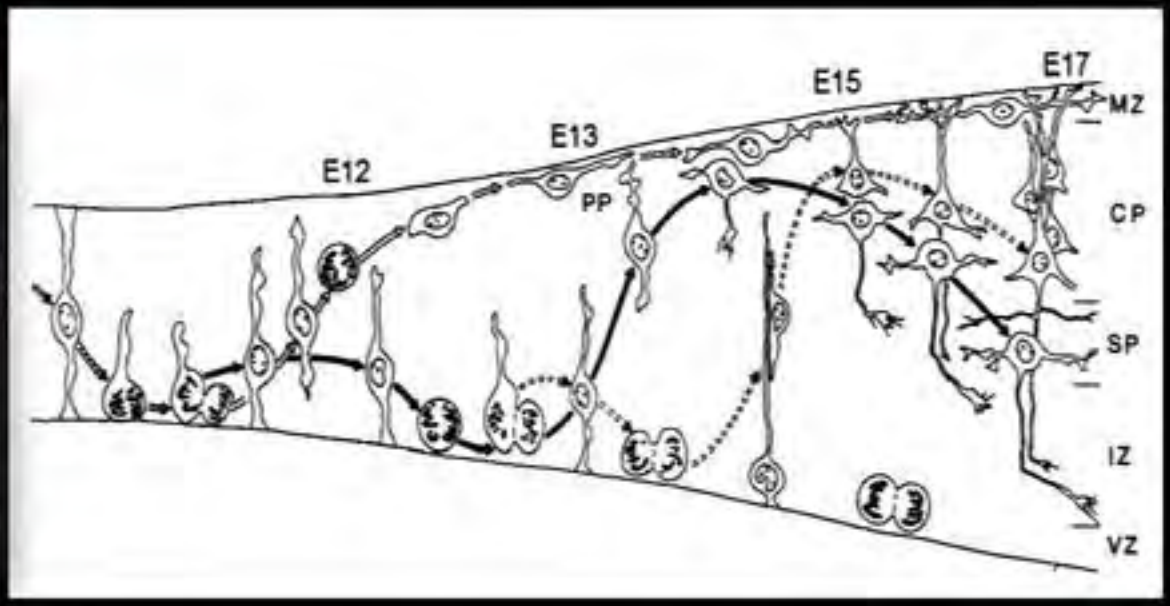
Blue Brain Project

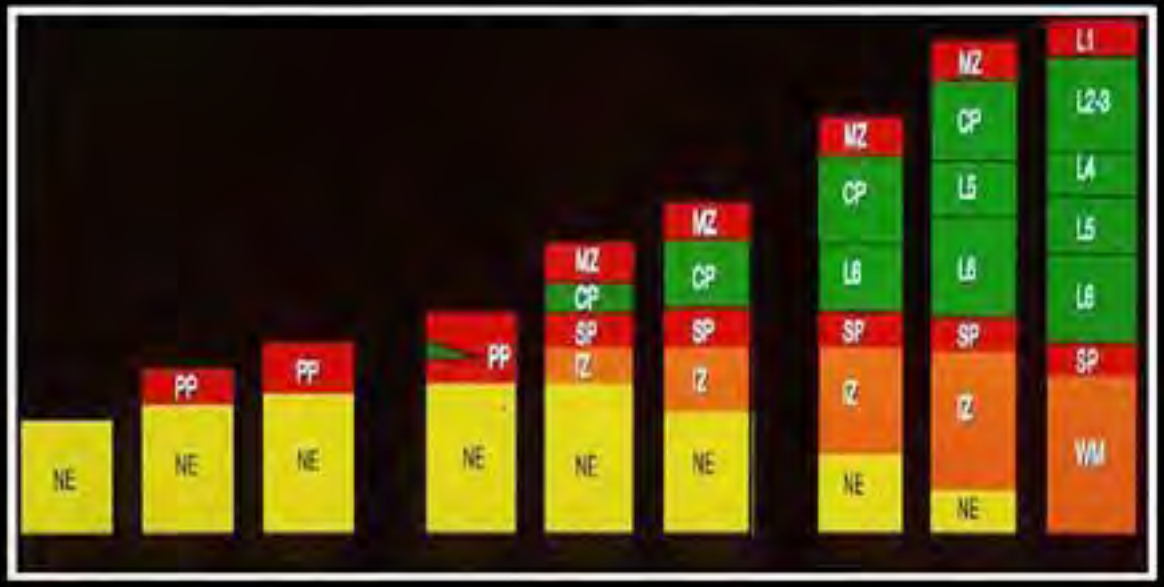
Recuerdo Embriologico



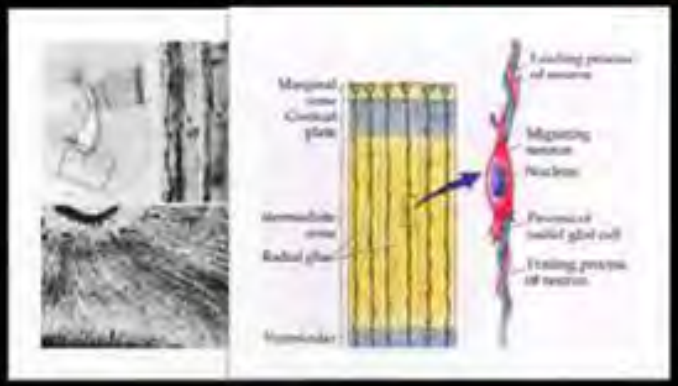
Yellow: Prosencephalon Mesencephalon Rhombencephalon

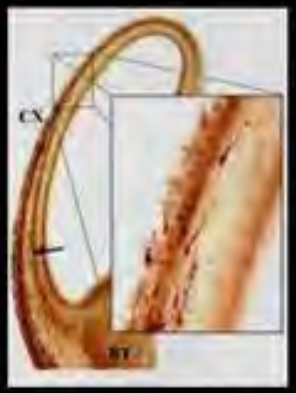
Neuroepitelio Cortical





Migraciones Telencefálicas





Migración Radial

Angevine & Sidman, 1961

Marín-Padilla, 1971-72

Rakic, 1972

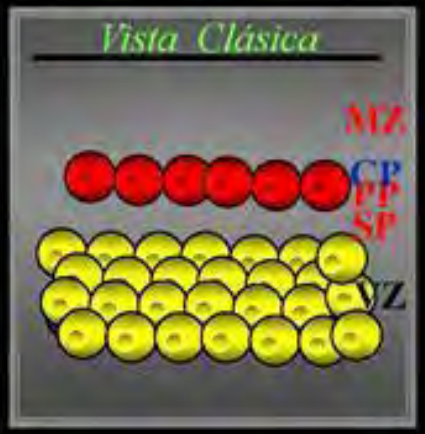
VS

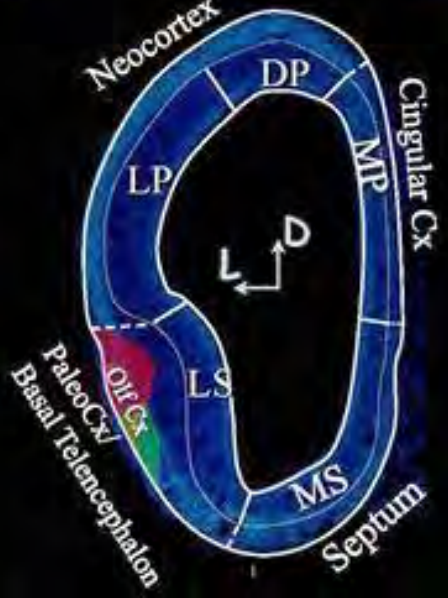
Migración Tangential

De Carlos et al., 1996

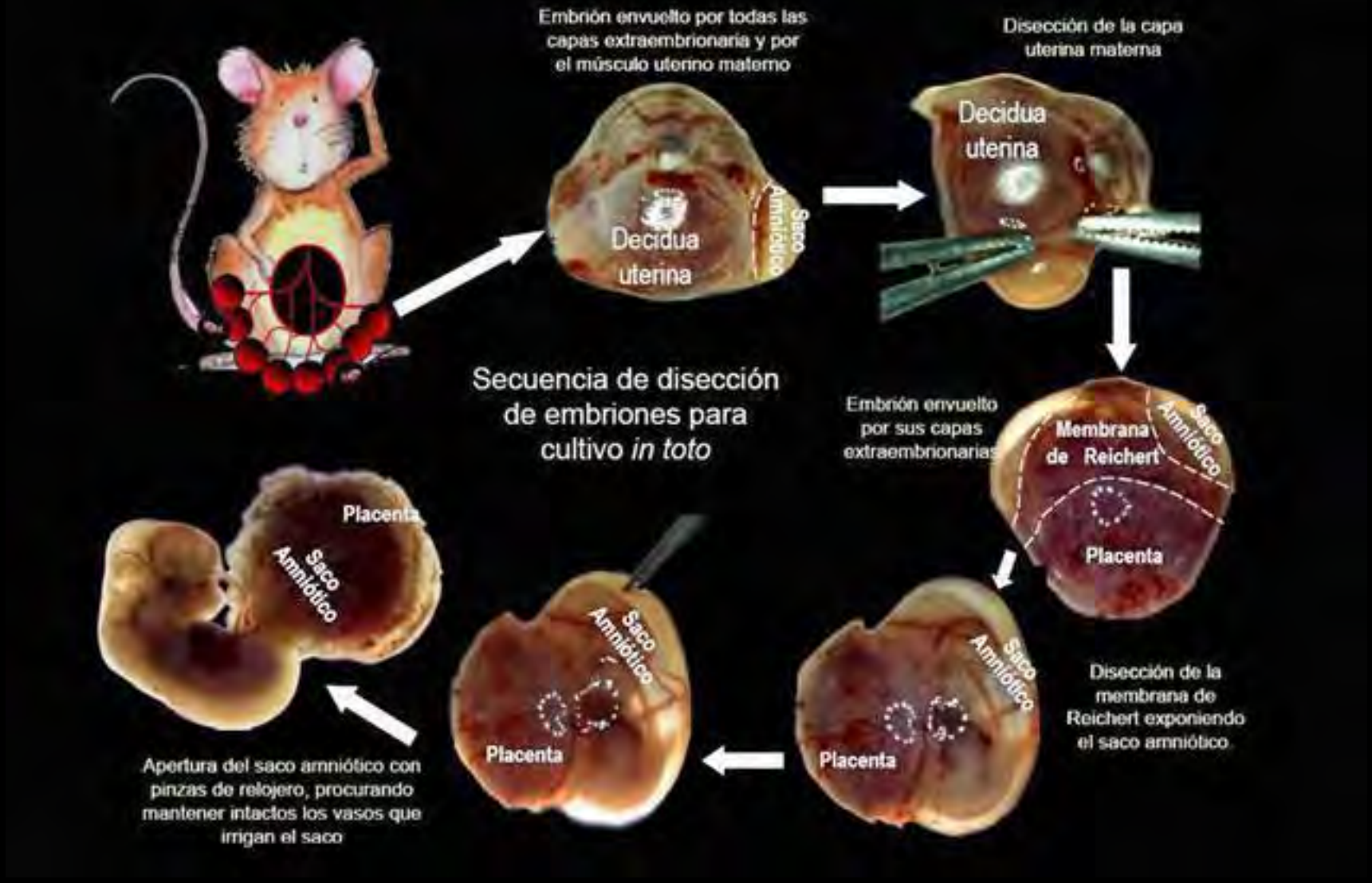
Tamamaki et al., 1997

Anderson et al., 1997

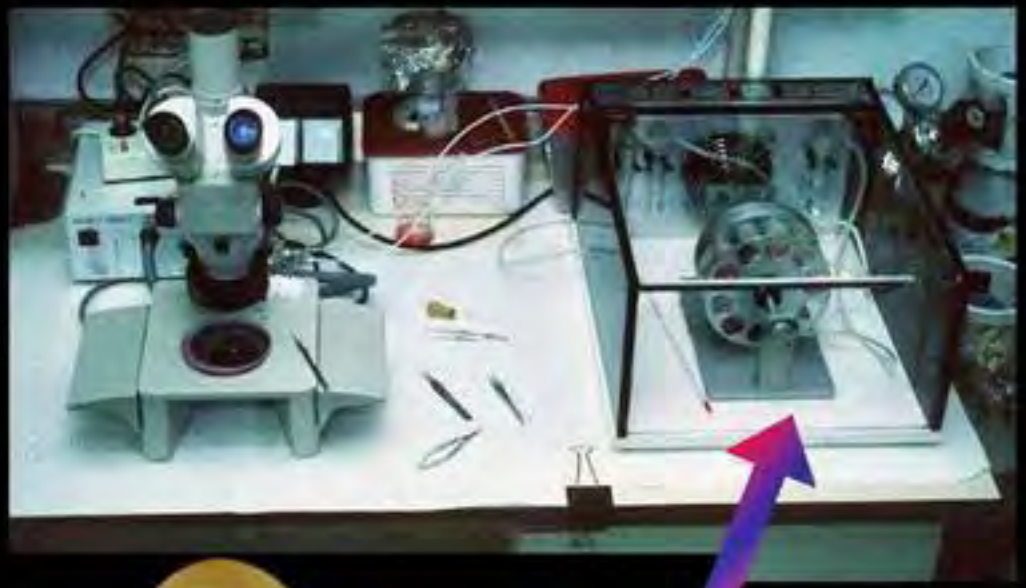




Cultivo de Embriones

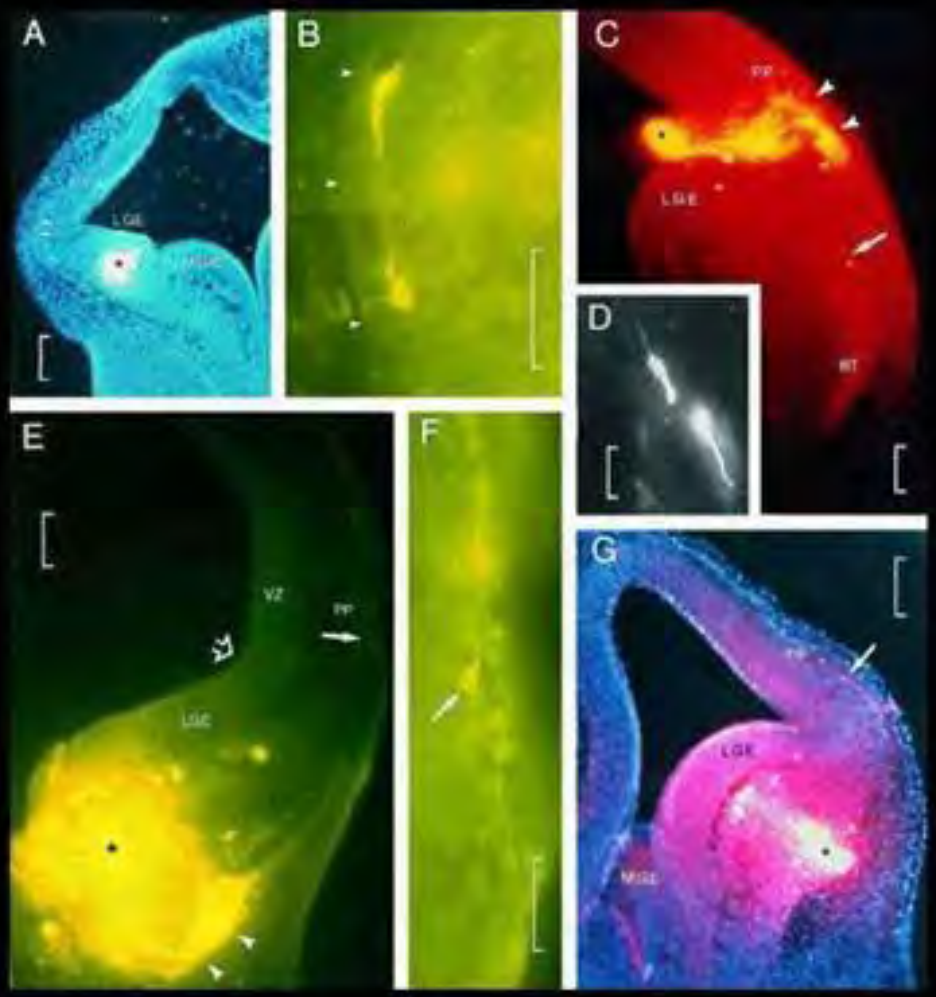


Cultivo de Embriones

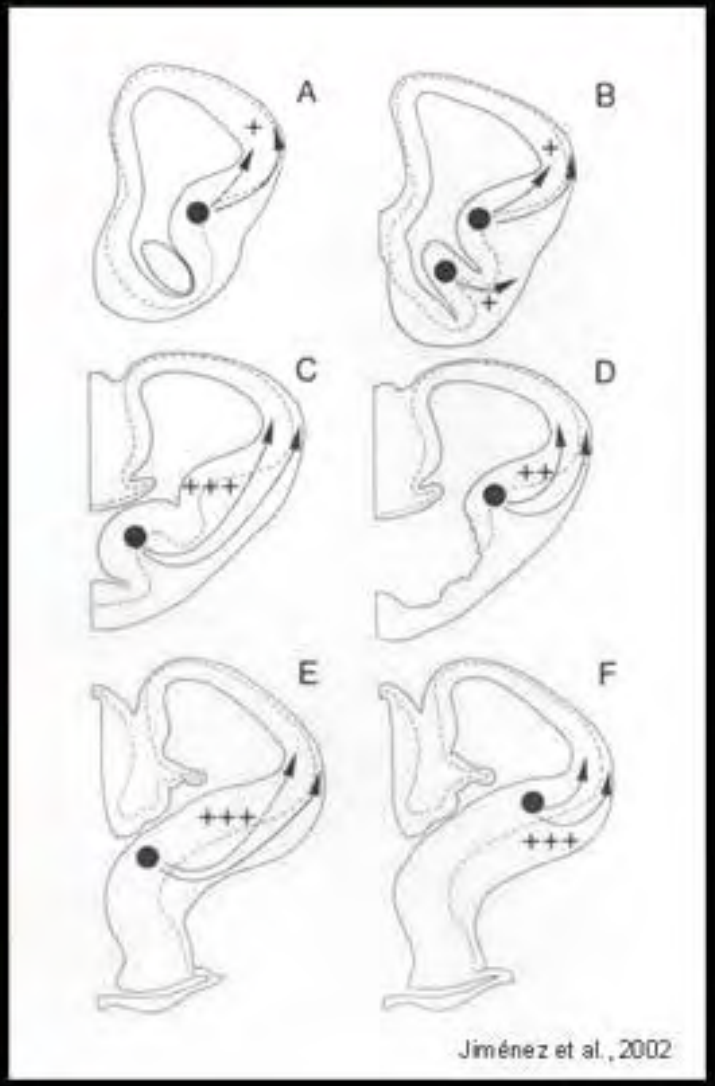


- 36ºC
- 95% O_2 + 5% CO_2
- 33 rpm
- Inactivated Rat Serum
- Glucose
- Antibiotic

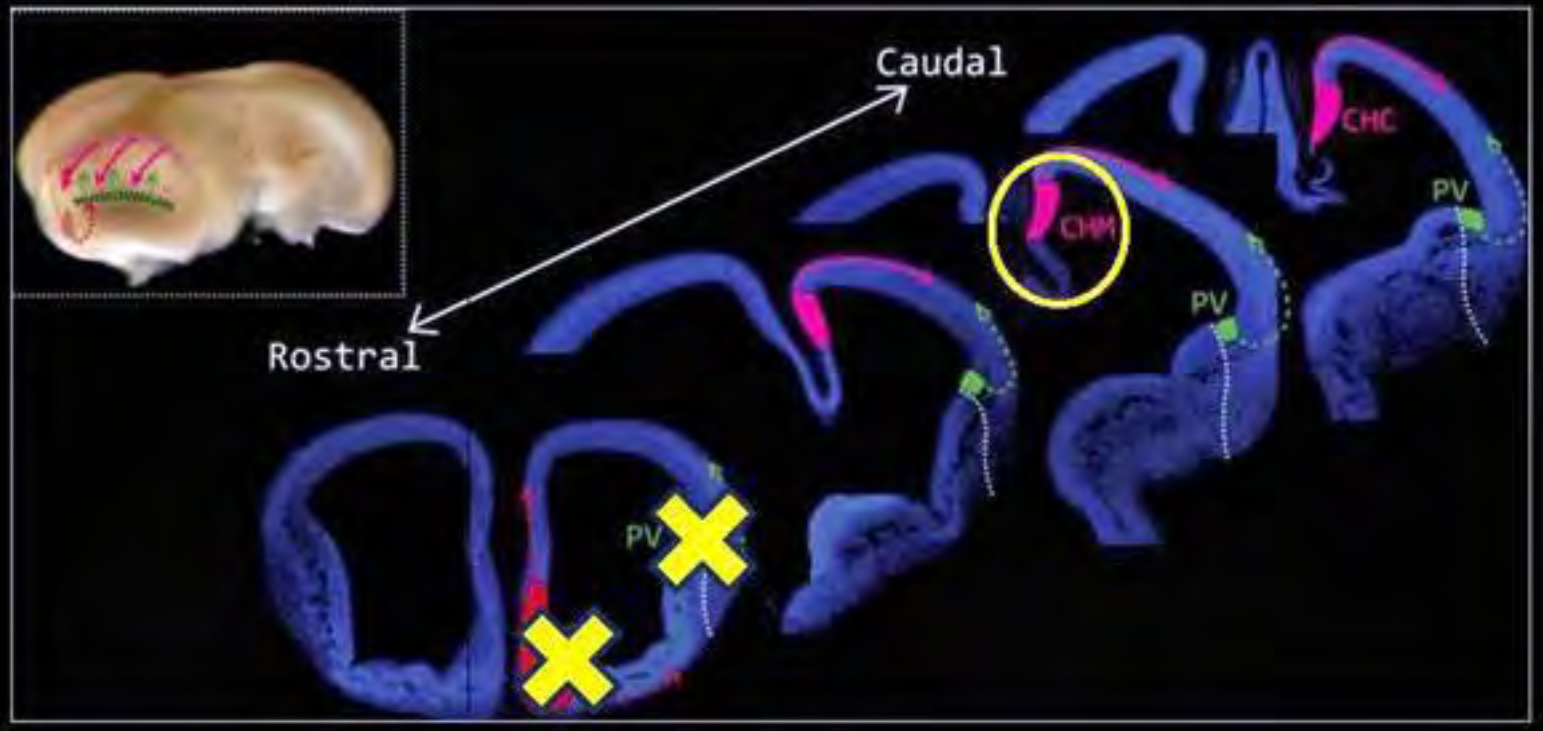
Origen Subpalial de la migración tangencial cortical



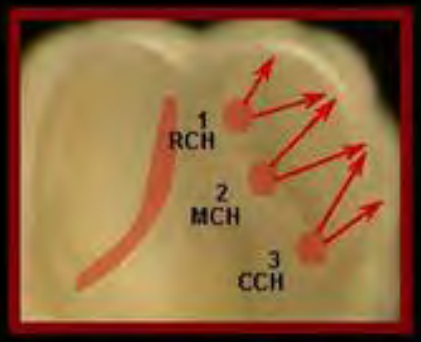
De Carlos et al, 1996

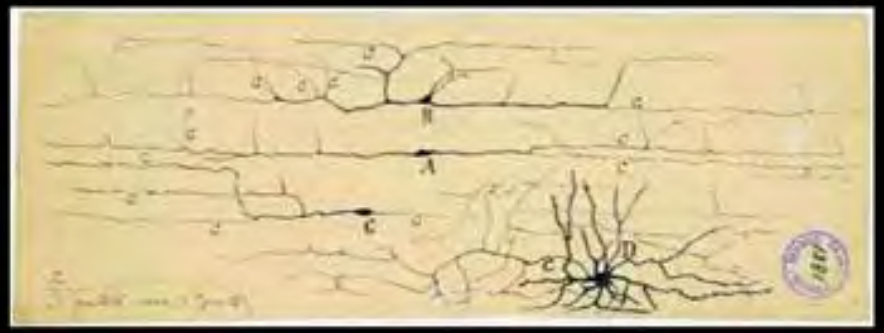


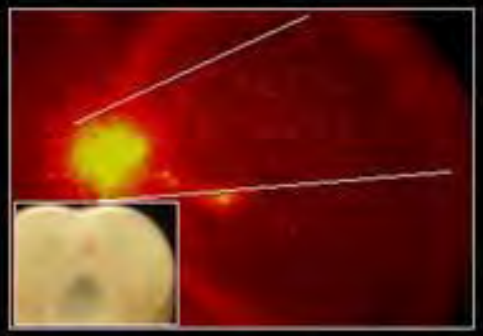
Células de Cajal-Retzius: Lugares de origen propuestos

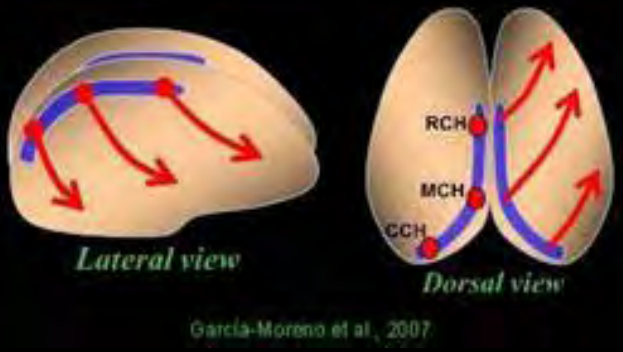


Migración celular desde el Cortical Hem



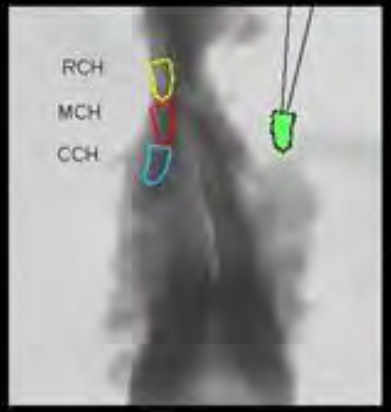


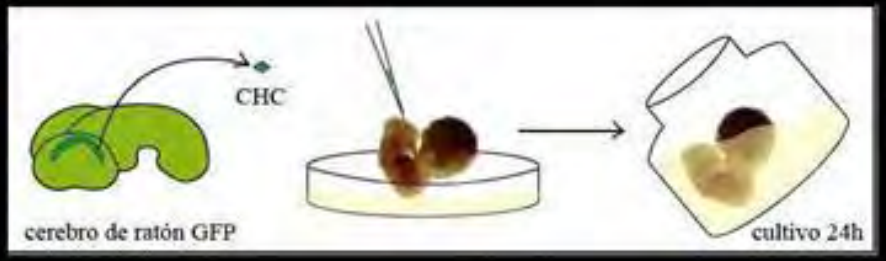




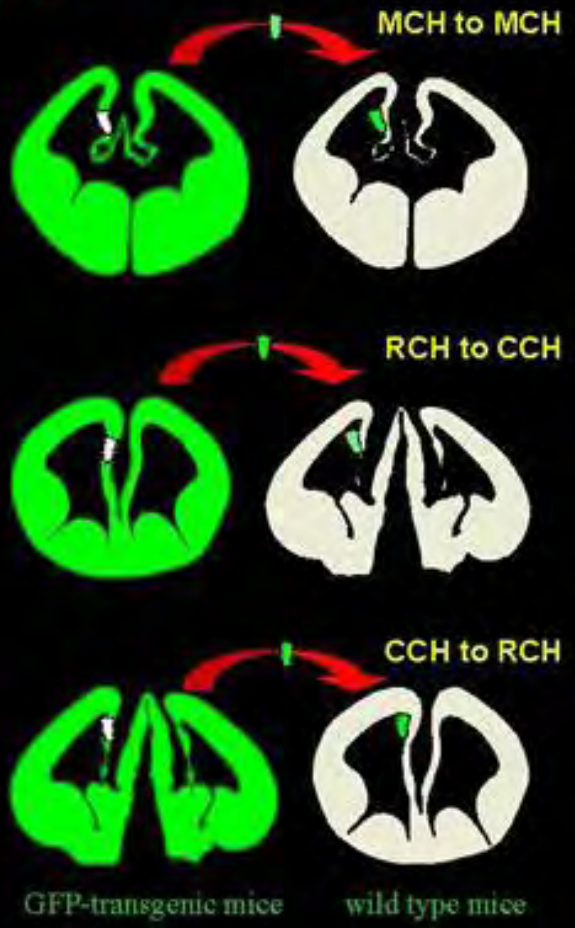
- Las células migratorias generadas en CH en estadios E10 y E11 pueblan completamente la superficie del neuroepitelio cortical en 24 horas.
- Estas células muestran una ruta de migración tangencial y oblicua, con dirección caudo-rostral.
- Estas células expresan Reelina como marcador especifico, y Calretinina.

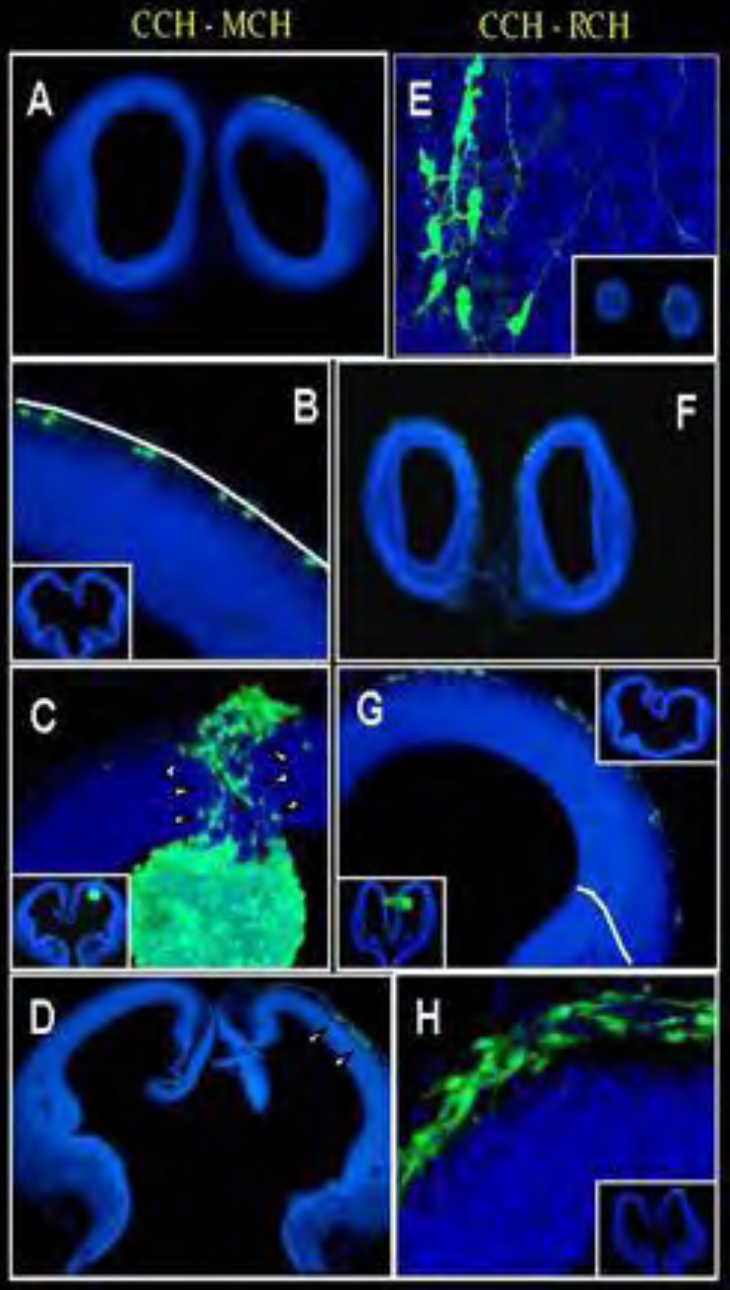
Dominios de Generación y Dinámica de las Células de Cajal- Retzius





Ceci et al , 2010





Implantes de Cortical Hem

- Células implantadas en áreas ectopicas se comportan como sus células vecinas, adoptando sus rutas de migración, de acuerdo al área cedrebral donde se hayan implantado.

Ceo et al., 2010