



NW Noggin / Latino Network

October 10, 2017





nwnoggin.org

Arts integrated neuroscience
outreach for K-12 & community



Collaboration and Connection



- Improve teaching skills, confidence, creativity, *employability*...
- Work with diverse populations of undergraduates, graduates, and academic priority K-12 students: OHSU, PSU, PNCA, WSUV, PPS, VPS...
- Learn to explain concepts in neuroscience to the broader community
- Build public support for taxpayer backed research efforts
- Excite a new generation of scientists and artists!

Brains, Bicycles & Beer

- Velo Cult



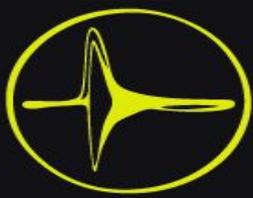
- Collaborate with creative artists and art students
- Present in a unique, fun, interactive public setting
- Build public support for and understanding of brain research



Upcoming Opportunities

- **School visits!**
 - Latino Network collaboration; Chile..?
 - Noggin Calendar of Events (nwnoggin.org)
- **Noggin Fest October 11th**
 - Alberta Rose Theater
- **Homelessness & the Brain October 19th**
 - p:ear & policy makers & homeless youth
- **#brains2DC**
 - School visits during SfN (11/13 & 11/14)
 - “Briefing with Brains” in Congress (11/15)
- **Spirit Mountain (2018)**
 - Native storytelling and the brain
 - Lincoln County, Winter/spring 2018





CINV

Centro Interdisciplinario de
Neurociencia de Valparaíso



Universidad
de Valparaíso
CHILE

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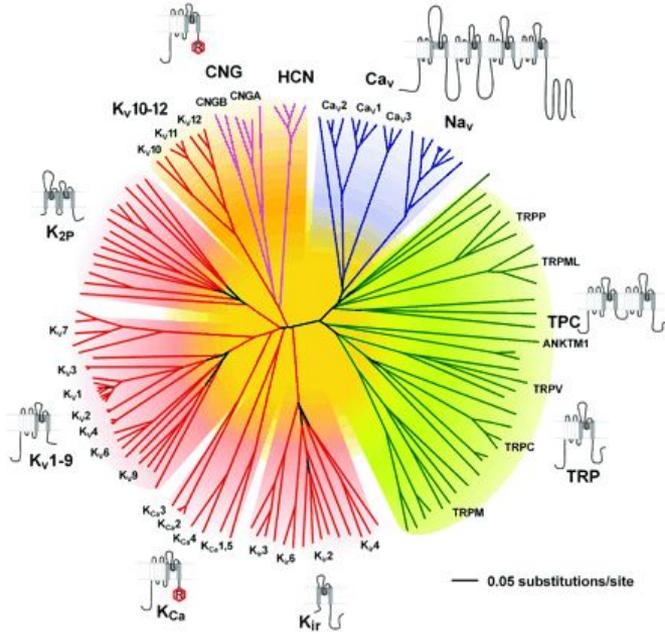
[Contact](#)

[🇬🇧 English \(English\)](#) ▾

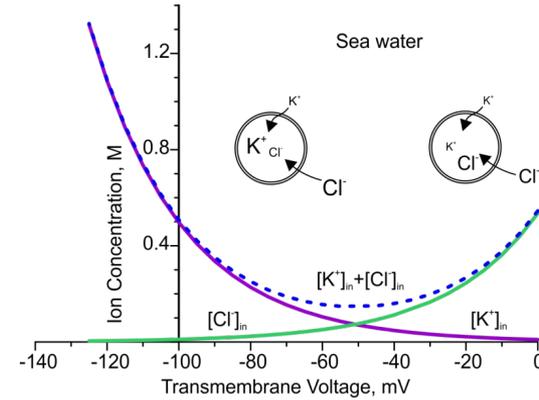
Potassium channels everywhere,
in your brain, and in Playa Ancha.

D. Naranjo

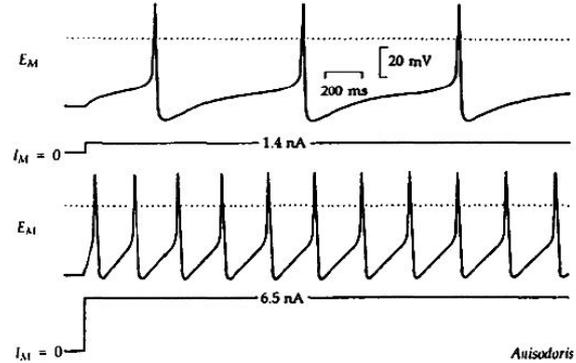
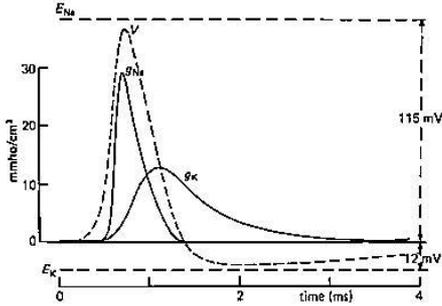
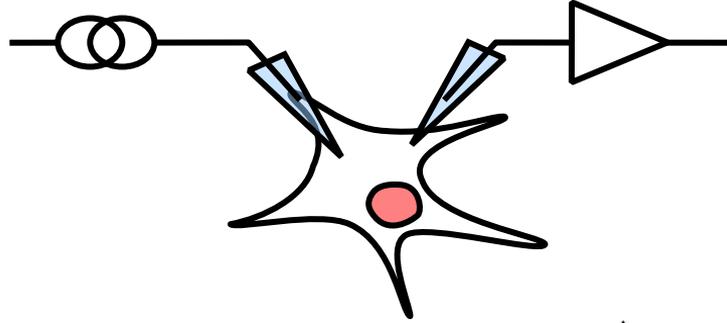
Cation channels are numerous, and potassium channels are by far the biggest family



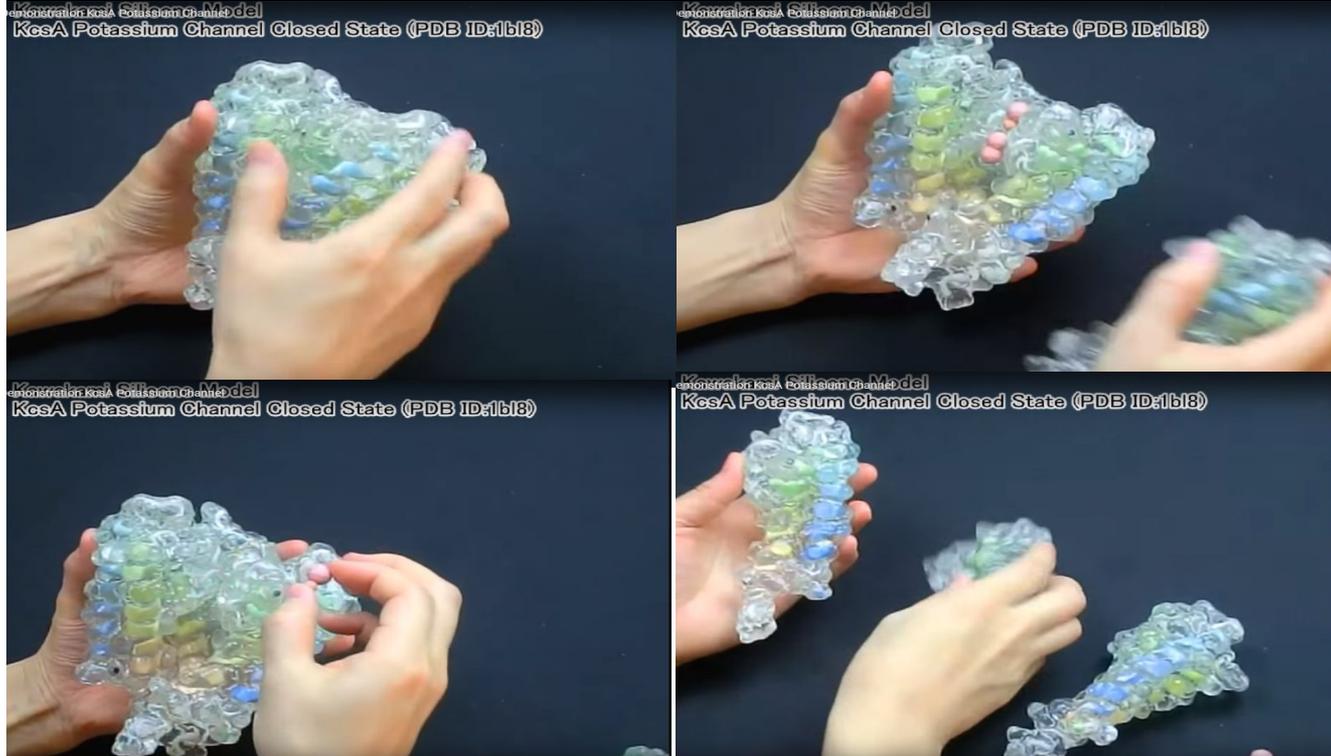
Yu & Catterall, *Sci. STKE*, 2004



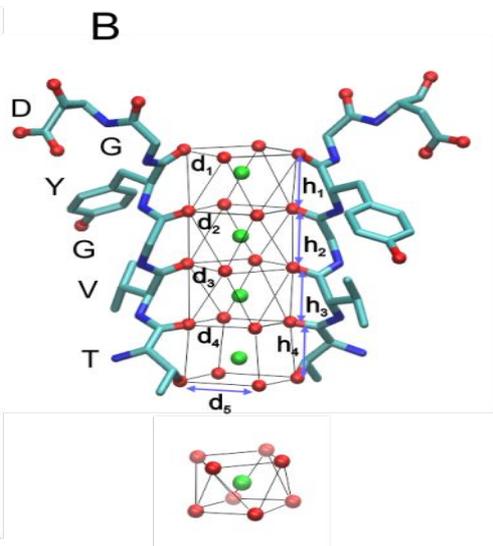
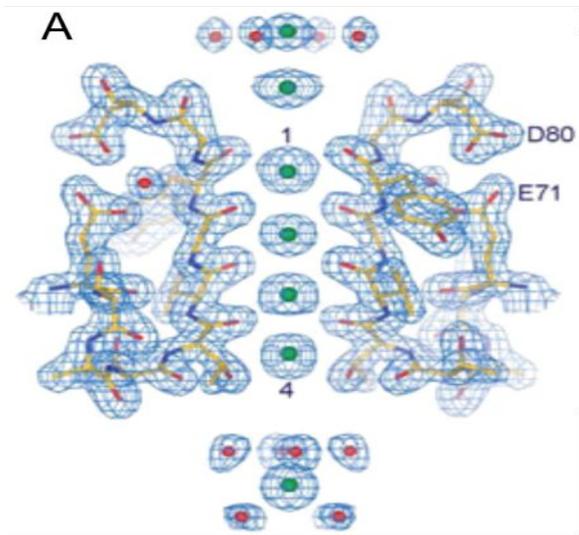
Potassium channels tune neuronal excitability



Potassium channels are tetrameric proteins



<https://www.youtube.com/watch?v=jLzuzZjaB3w>



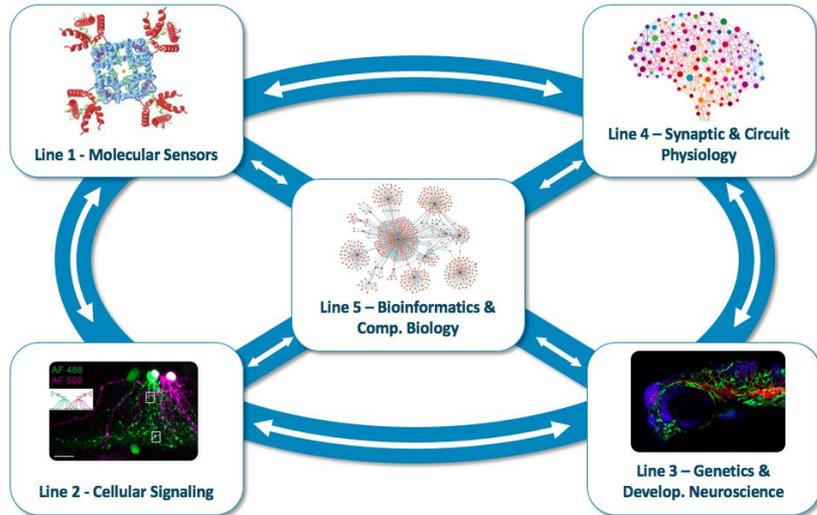
C

O-O distances at the edges of the water surrogating cages in the selectivity filter, Å

Structure (Resol.)	<i>KcsA</i> 1k4c (2.0 Å)	<i>Kv1.2/2.1</i> 2r9r (2.4 Å)	<i>MthK</i> 4hyo (1.65 Å)	<i>KvAP</i> 1orq (3.2 Å)
d₁	3.6	3.5	3.5	4.1
d₂	3.3	3.3	3.2	3.9
d₃	3.3	3.3	3.3	3.9
d₄	3.2	3.3	3.1	3.1
d₅	3.7	3.9	3.6	3.4
h₁	3.1	3.1	3.1	2.9
h₂	3.0	3.0	3.0	2.7
h₃	3.1	3.1	3.2	3.3
h₄	3.0	2.9	2.9	2.9

Naranjo et al, 2016. *J Gen Physiol.* 148:277-291

The CINV has been imposed a mission



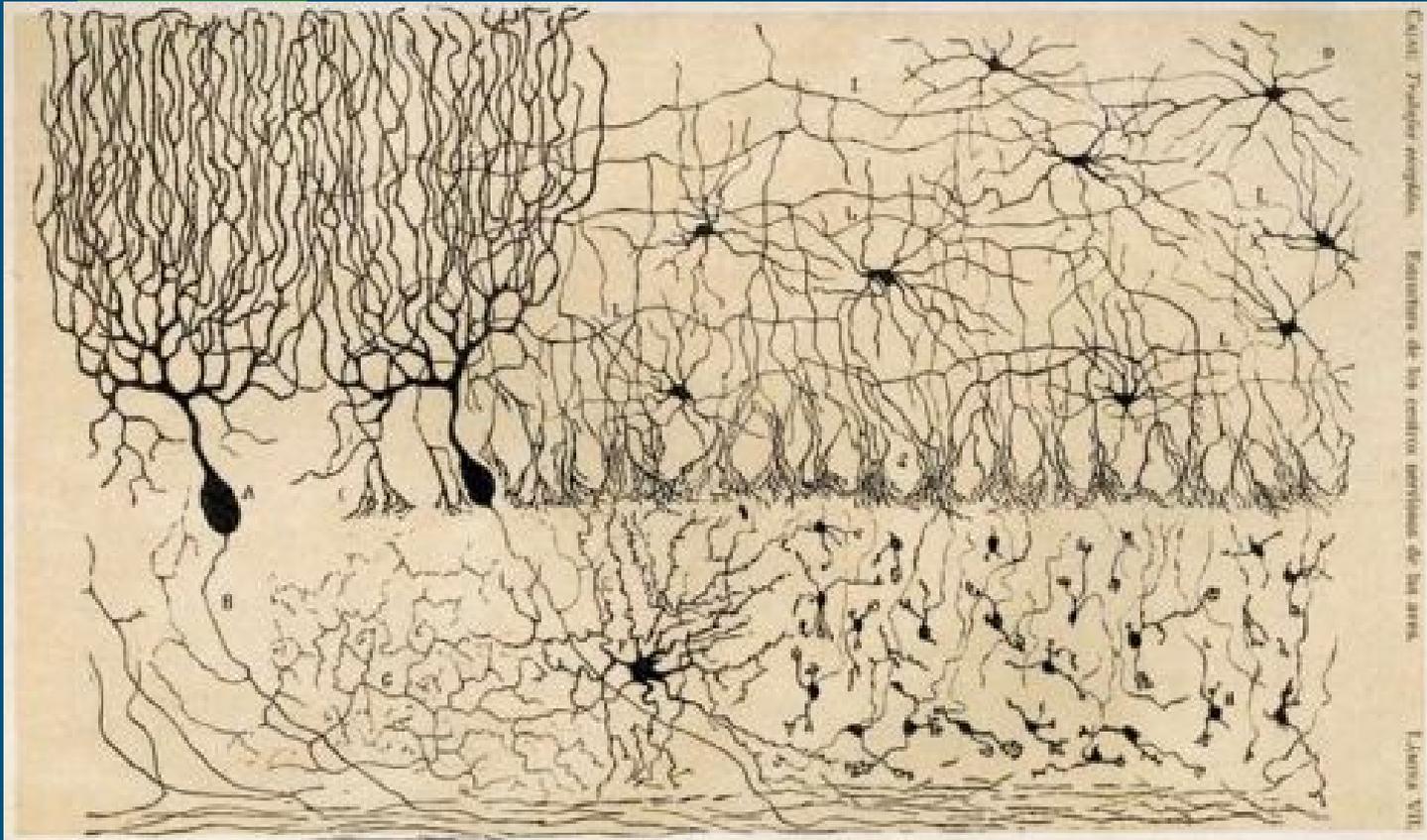
- To Promote Valparaiso University as a relevant institution in the national scientific work.
- To Strengthen the areas of Neuroscience by developing multidisciplinary projects involving different researchers and national and international institutions.
- To Develop new research areas that are of strategic social impact.
- To Develop projects whose activities involving cultural dissemination of science to the community
- To Attend PhD and Masters programs in Neuroscience at the University of Valparaiso.
- To Support undergraduate teaching at the University of Valparaiso at the highest and current level.

<http://cienciaaltiro.cl/>

The screenshot displays the website cienciaaltiro.cl in a browser window. The page features a logo with a sun and the text "CIENCIA al Tiro" and the main heading "Ciencia al Tiro". A large photograph shows a group of seven people in a room with yellow walls, some holding a book titled "La ciencia al tiro". Below the photo is a navigation bar with five colored buttons: "SOBRE NOSOTROS" (green), "TALLERES" (magenta), "LIBRO" (blue), "EDIFICIO VERDE" (orange), and "DONACIONES" (dark blue). The browser's taskbar at the bottom shows the date 09-10-2017 and time 16:10.

And Montemar...

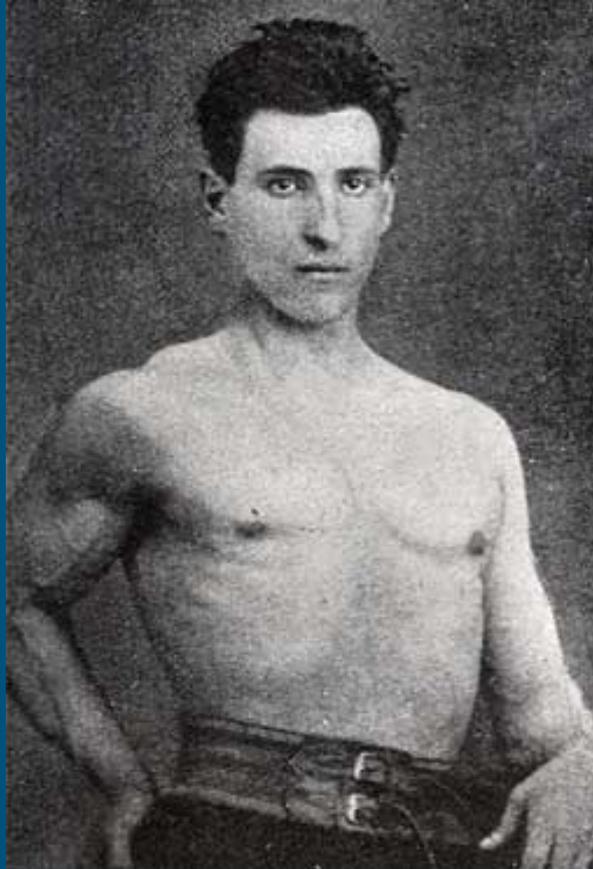
What Do You See?



Santiago Ramón y Cajal



Shoemaker, Barber, Gymnast, Artist, and a Homemade Cannon?

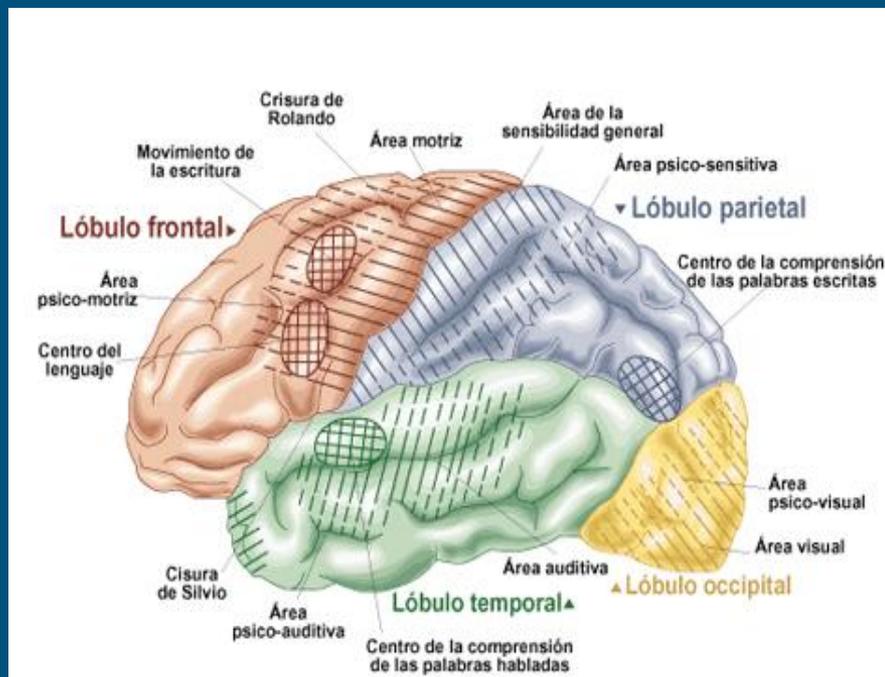
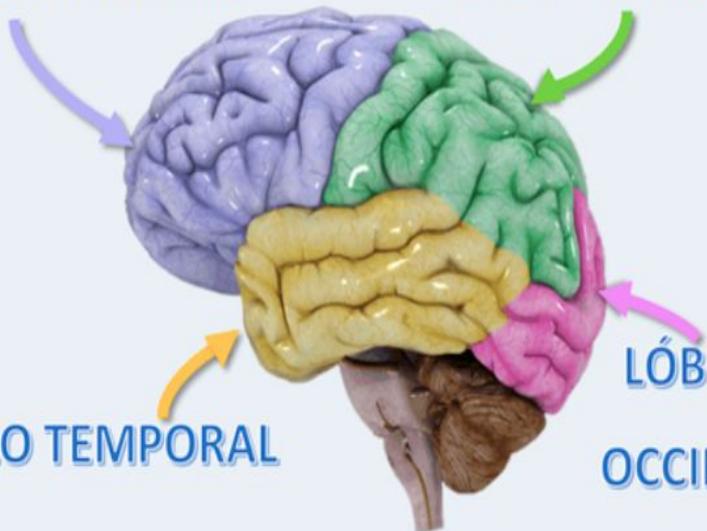


LÓBULO FRONTAL

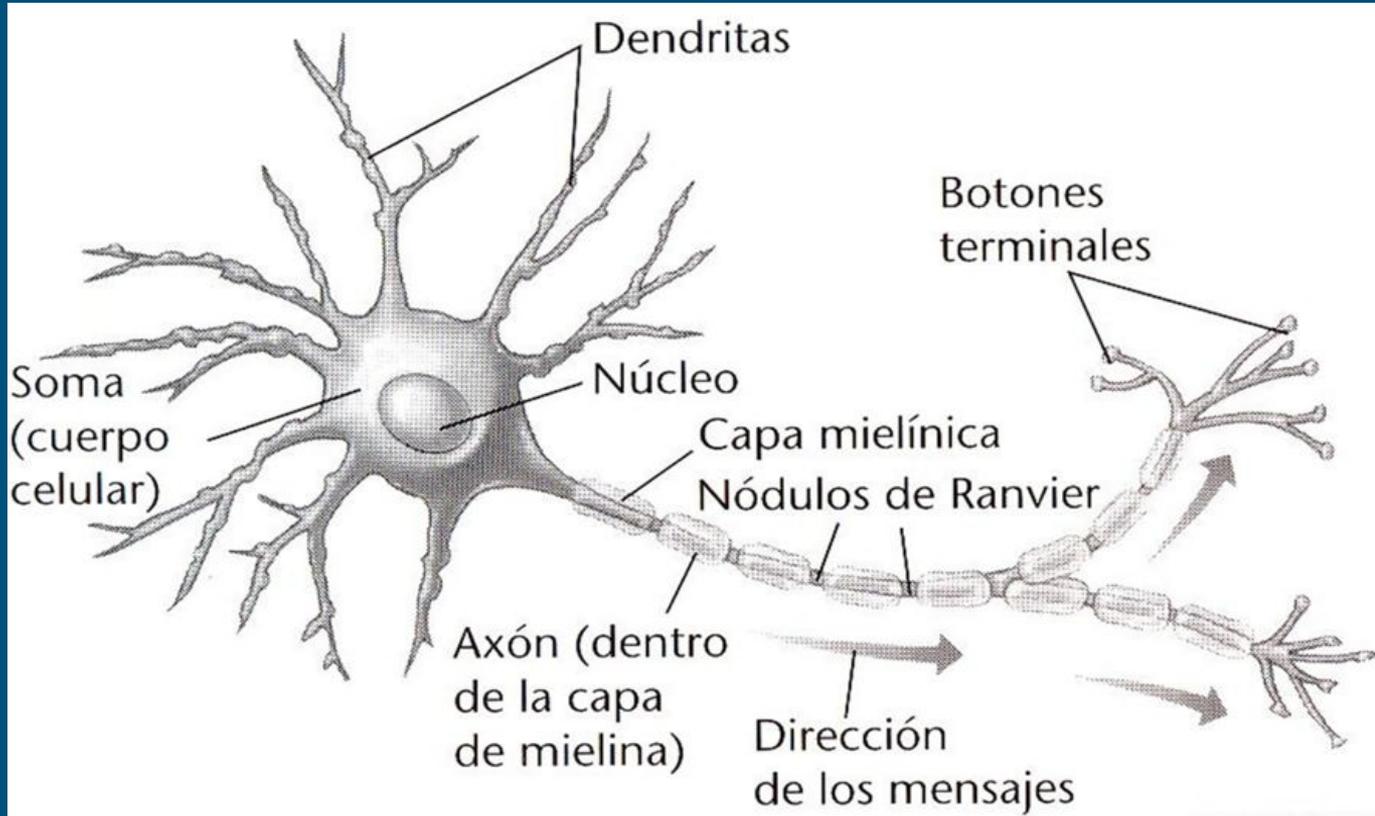
LÓBULO PARIETAL

LÓBULO TEMPORAL

LÓBULO OCCIPITAL



La Neurona!



Bilingualism Helps Build Connections

- Being bilingual is something to embrace and to be proud of; the languages that you know are artifacts of your ancestry and culture.
- Bilingualism has positive effects at both the social and neurological level.

“For instance, when bilingual people have to switch between naming pictures in Spanish and naming them in English, they show increased activation in the dorsolateral prefrontal cortex (DLPFC), a brain region associated with cognitive skills like attention and inhibition”

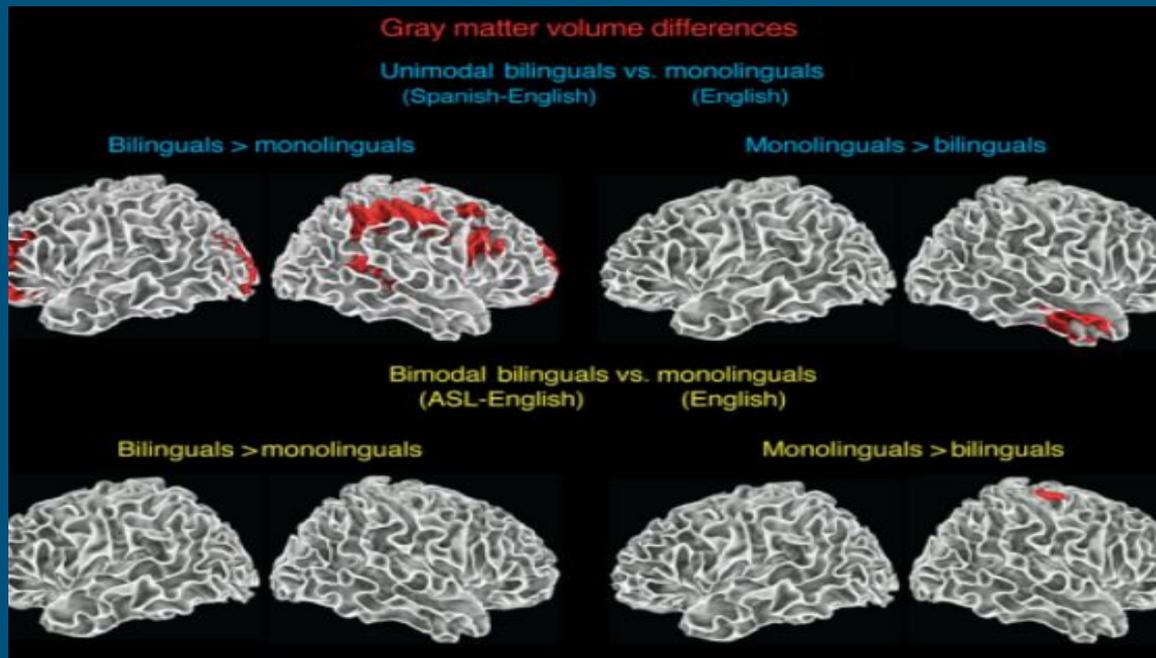
... This is a skill referred to as code switching!

Neurological benefits:

- Overall perform better on executive functioning (decision-making, information processing, emotional control, sustained attention)
- Better problem-solving
- Bilingualism can delay the age of dementia onset (suggests)

Neurological Benefits (continued)

- Bilingualism aids in cognitive processing; increased neuronal connectivity
- Increase in learning aids for cognitive and sensory processing, this results in improved processing of information.
- Being bilingual alludes to learning a 3rd language; bilinguals have a higher chance of learning a 3rd language



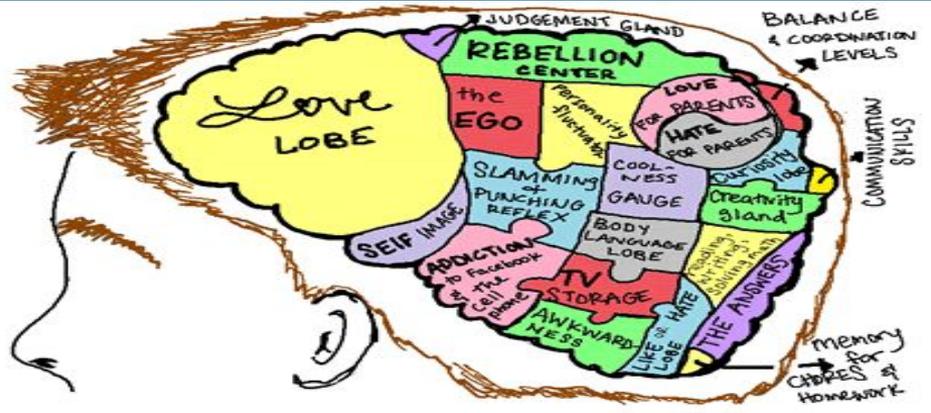
- “Spanish-English bilinguals had greater bilateral frontal (activity) compared to monolingual English speakers”
- “The improvements in cognitive and sensory processing driven by bilingual experience may help a bilingual person to better process information in the environment, leading to a clearer signal for learning.”

Social Benefits

- Increase in job opportunities
- You can be more culturally aware
- Helps to relate to people in various communities
- Opportunity to earn more in your career



THE AVERAGE TEENAGE BRAIN



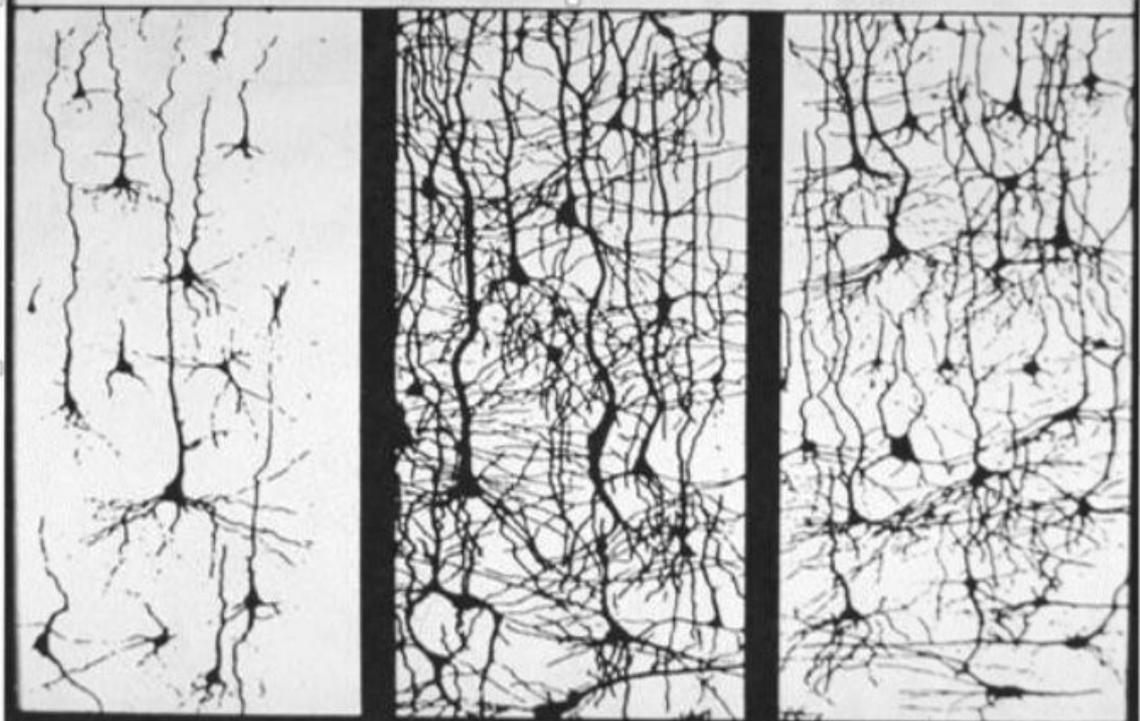
A time of change:

- Transition from childhood to adulthood
- Sexual maturation
- Marked by rapid biological, physical, social and cognitive change
- Increases in emotional intensity

baby

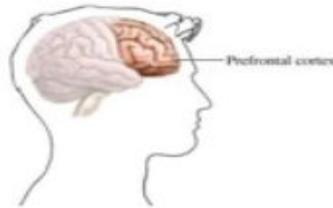
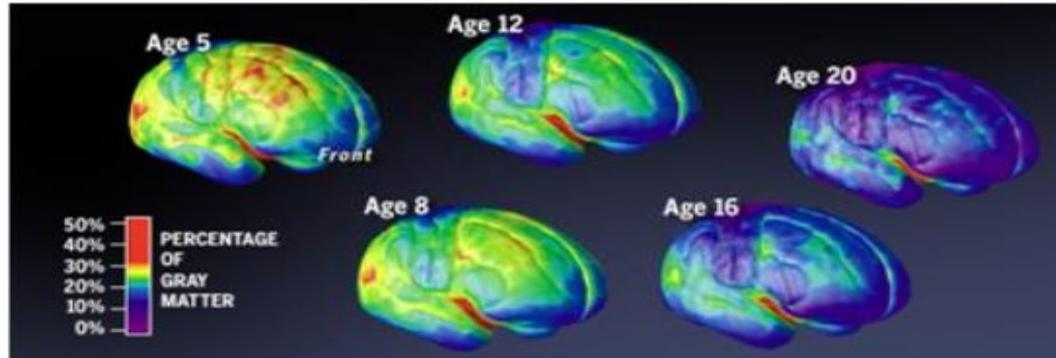
13 year old

22 year old



Brain/Cognitive Development

■ Red (least mature) to blue (more mature)



- Controlling impulses
- Inhibiting inappropriate behavior
- Initiating appropriate behavior
- Shifting / adjusting behavior when situations change
- Forming strategies and planning behavior
- Setting priorities among tasks and goals
- Making decisions

The Frontal Lobe

... Is important for changes in the way teens think:

- Inhibition/Judgment
- Problem solving
- Cognitive/emotional control
- Planning and understanding long term consequences
- Rule/set-shifting (code switching)
- Attention/working memory
- Social awareness and perspective taking



- Studies suggest that bicultural/multicultural persons have a higher level of cognitive complexity than monocultural persons.
- Evidence supports the idea that bicultural/multicultural persons have linguistic and developmental advantages over monocultural persons (Benet-Martínez, Lee, & Leu, 2006).