

NORTHWEST NOGGIN

ENGAGING COMMUNITY THROUGH
NEUROSCIENCE RESEARCH AND ART!



ALL VOLUNTEER

TWELVE YEARS (SINCE 2012)!

NO ADMISSION - NO TUITION - OPEN TO EVERYONE

65,000+ PUBLIC K12 STUDENTS/COMMUNITY MEMBERS

LOCAL/NATIONAL/INTERNATIONAL COLLABORATORS



GO PLACES

- WHERE STEM PROGRAMS DON'T GO
- WHERE MONEY AND RESOURCES DON'T GO
- PUBLIC K-12 SCHOOLS
- RURAL AND URBAN COMMUNITIES
- HOUSELESS YOUTH NONPROFITS
- CORRECTIONAL FACILITIES

Siletz, Amity & Willamina, OR
Pop: 4000

Davenport, WA
Pop: 1700

Astoria, OR
Pop: 10,000

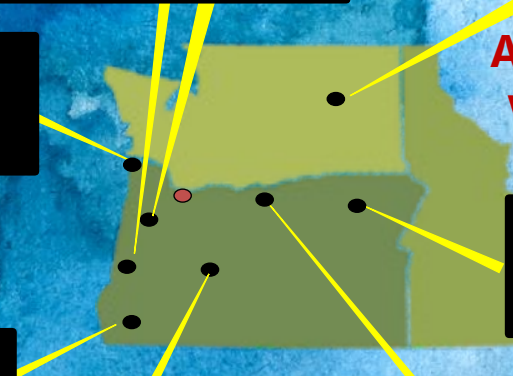
A few places we've been

La Grande, OR
Pop: 13,000

Meservy Meadows, OR
Pop: ~40

Sisters, OR
Pop: 3081

Heppner & Lone, OR
Pop: 1240



Youth get visual, hands-on experience with the brain

NW Noggin, a neuroscience outreach nonprofit, reached out to youth at MacLaren Youth Correctional Facility this week to teach about brain development.



Noggins on the Coast



Astoria-Megler Bridge
A four mile long steel cantilever through truss bridge connecting Oregon and Washington state

Corpus Callosum
White matter (myelinated neuron axons) connecting the cortex in both our left and right hemispheres

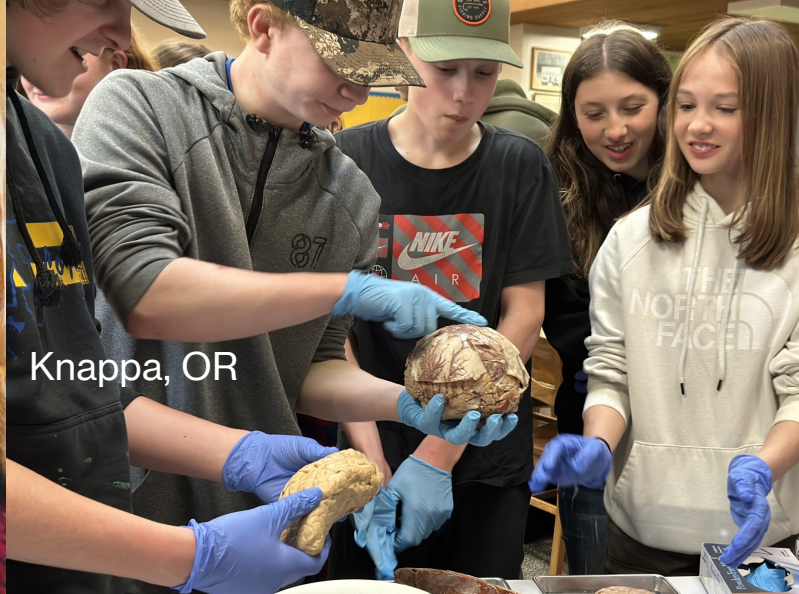


LISTEN

- LIVED EXPERIENCES
- RELEVANT KNOWLEDGE
- SEEING OTHER PEOPLE



Heppner, OR



Knappa, OR

HOMELESSNESS & THE BRAIN

Portland, OR

Thurs, Oct 19th
10am - 1pm



Sisters, OR

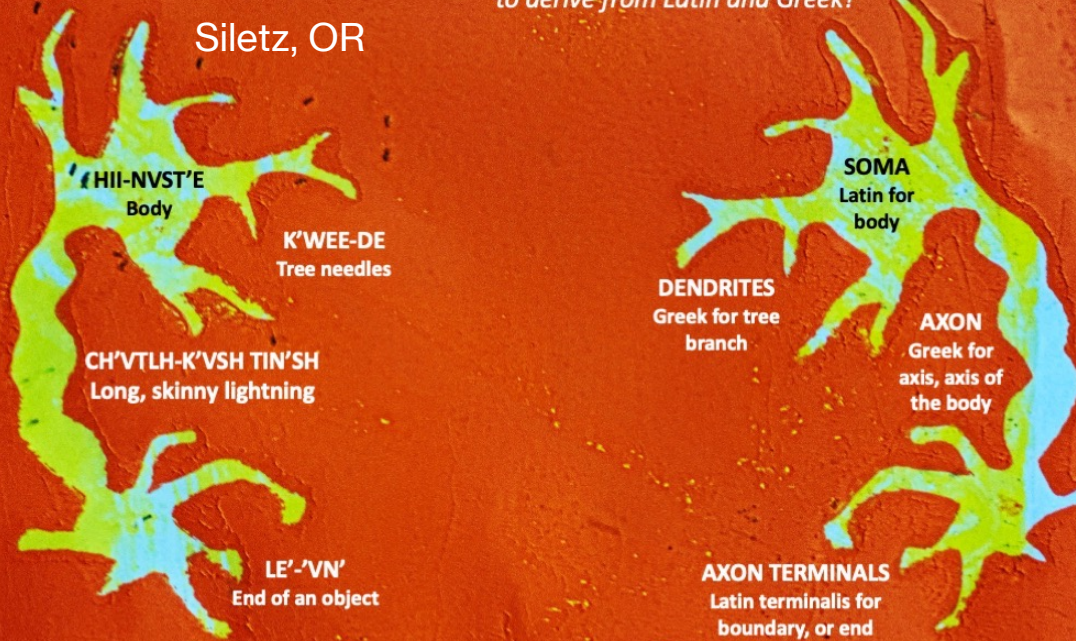


Portland, OR

DEE-NI NEURON

Siletz, OR

Do neuroanatomical terms have to derive from Latin and Greek?



#showusyourbraincell

nwnoggin.org

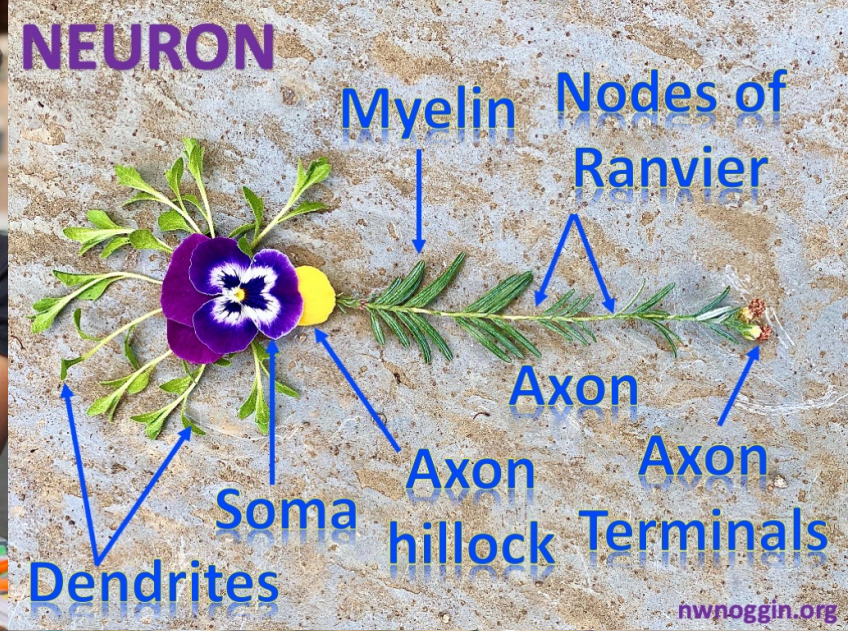
SHARE STORIES

- EMPOWER NEW VOICES
- BROADEN THE CONVERSATION
- MAKE PUBLIC INVESTMENT IN RESEARCH RELEVANT
- INVITE NEW PARTICIPANTS, PERSPECTIVES & **BRAINS**



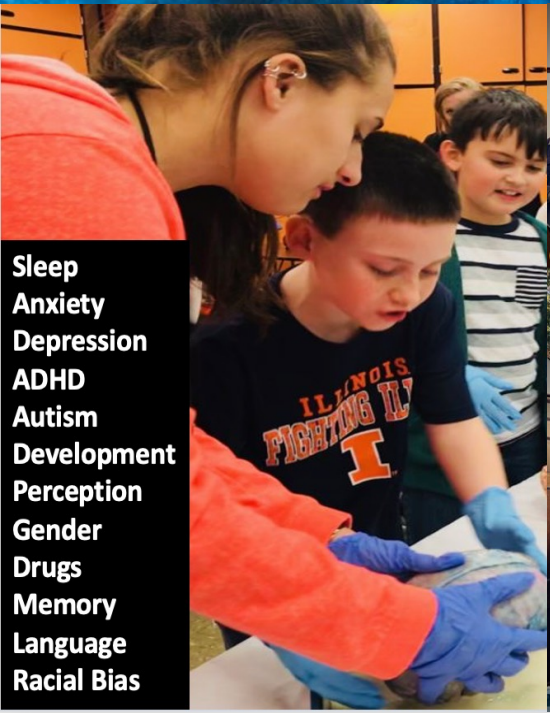
MAKE ART

- ENGAGEMENT
- PERSONAL RELEVANCE
- SELF-AWARENESS AND **EMPATHY**



INFORM POLICY

- RESEARCH TOPICS ARE *RELEVANT*
- INTERDISCIPLINARY APPROACHES *WORK*
- 1. SCHOOL START TIMES FOR ADOLESCENTS
- 2. PERMANENT STANDARD TIME
- 3. HOUSING FIRST



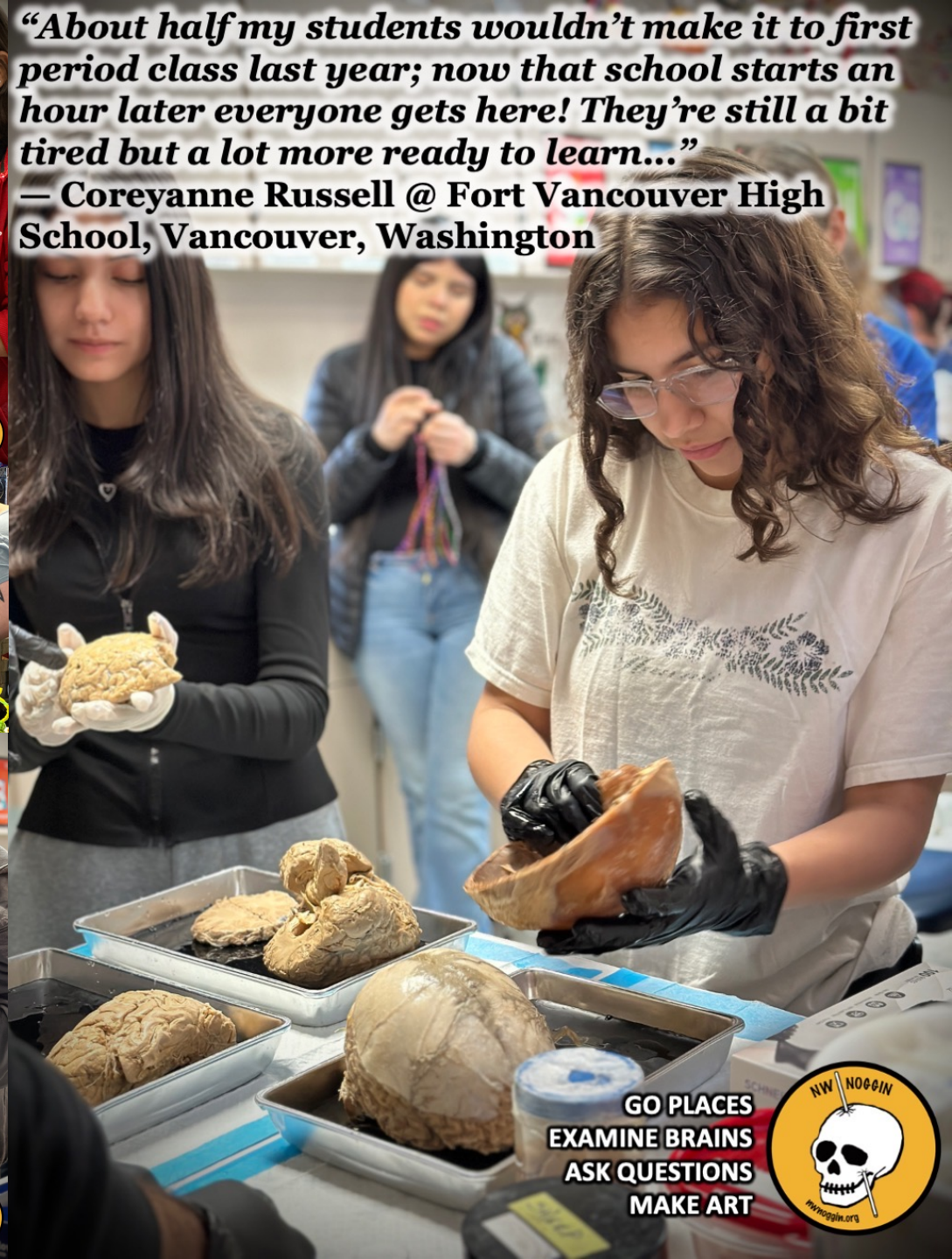
- Sleep
- Anxiety
- Depression
- ADHD
- Autism
- Development
- Perception
- Gender
- Drugs
- Memory
- Language
- Racial Bias



Healthy start times

What is changing?

We are changing our schools' start times schedule next year based on learnings from our community feedback as well as the most current research about adolescent development. We plan to solidify our bell schedules and announce the official new times before the last day of school on June 20, 2023.



“About half my students wouldn’t make it to first period class last year; now that school starts an hour later everyone gets here! They’re still a bit tired but a lot more ready to learn...”
— Coreyanne Russell @ Fort Vancouver High School, Vancouver, Washington



**GO PLACES
EXAMINE BRAINS
ASK QUESTIONS
MAKE ART**



**GO PLACES
EXAMINE BRAINS
ASK QUESTIONS
MAKE ART**

In 2023, we reached out to artists and STEM colleagues at the Universidad de Valparaíso Chile. Along with the PSU Education Abroad Office and Academic Programs International we created Cerebrarte, the first international, homestay-based STEAM program exploring the rich art and neuroscience traditions of the Valparaíso region.

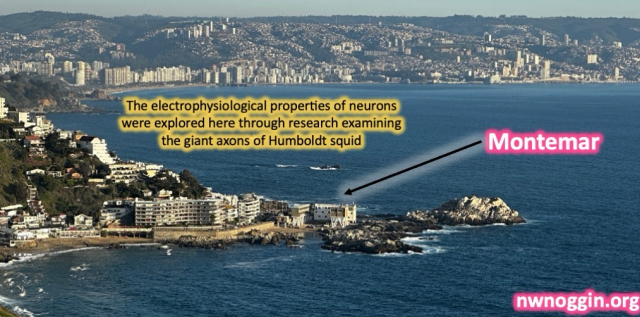
**-VALPARAÍSO
-NEUROSCIENCE
-CITY OF ART**



**Study Interdisciplinary
Neuroscience in Chile!**

**JOIN US: 2025!
Arte y Cerebros en Chile!**

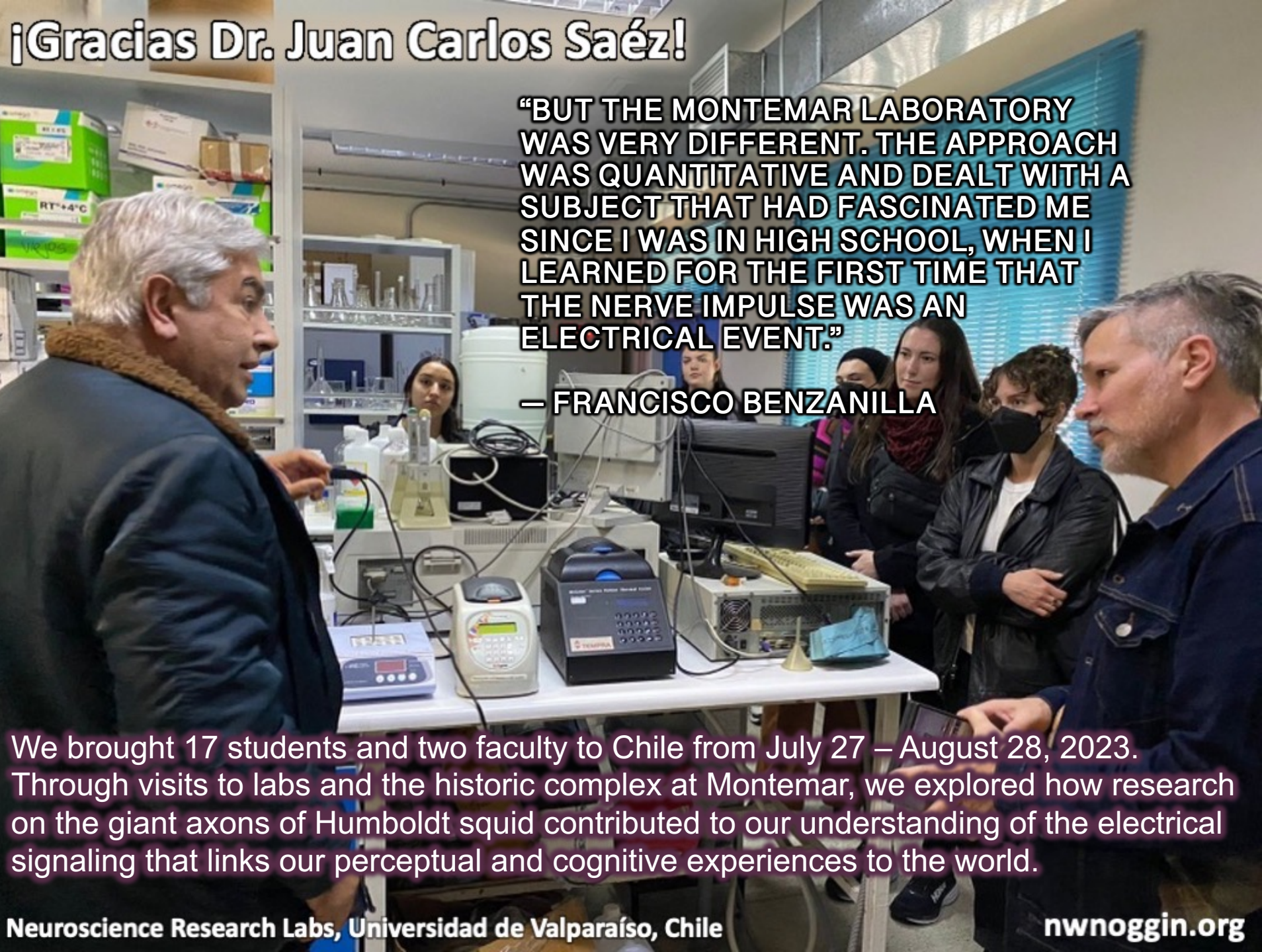




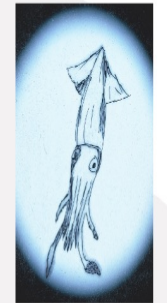
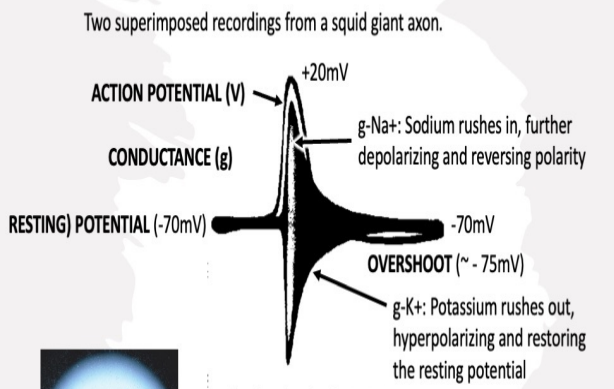
¡Gracias Dr. Juan Carlos Saéz!

“BUT THE MONTEMAR LABORATORY WAS VERY DIFFERENT. THE APPROACH WAS QUANTITATIVE AND DEALT WITH A SUBJECT THAT HAD FASCINATED ME SINCE I WAS IN HIGH SCHOOL, WHEN I LEARNED FOR THE FIRST TIME THAT THE NERVE IMPULSE WAS AN ELECTRICAL EVENT.”

— FRANCISCO BENZANILLA



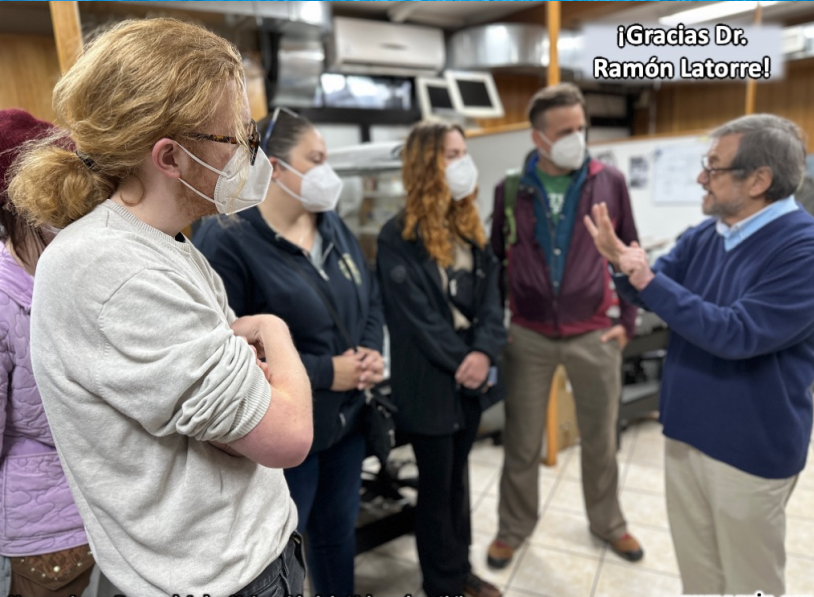
Conductance increase during the action potential.



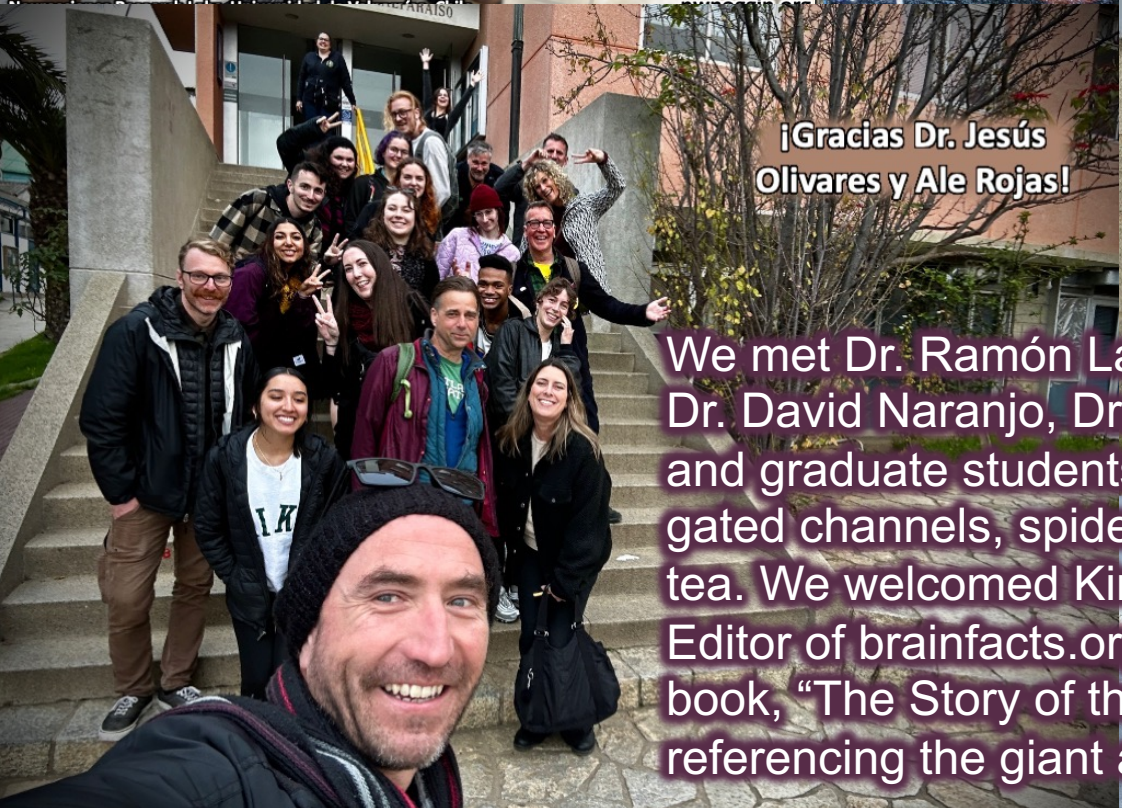
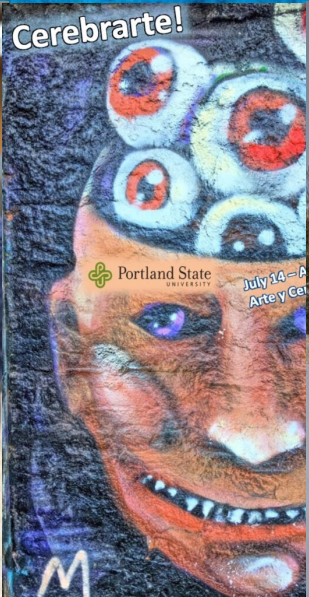
Reproduced from Cole, K.S., and Curtis, H.J. (1939). Electric impedance of the squid giant axon during activity. *J. Gen. Physiol.* 22: 649-670

Time tick marks along the bottom are 1 ms apart; (nonlinear because the time axis is logarithmic)

We brought 17 students and two faculty to Chile from July 27 – August 28, 2023. Through visits to labs and the historic complex at Montemar, we explored how research on the giant axons of Humboldt squid contributed to our understanding of the electrical signaling that links our perceptual and cognitive experiences to the world.



¡Gracias Dr. Ramón Latorre!



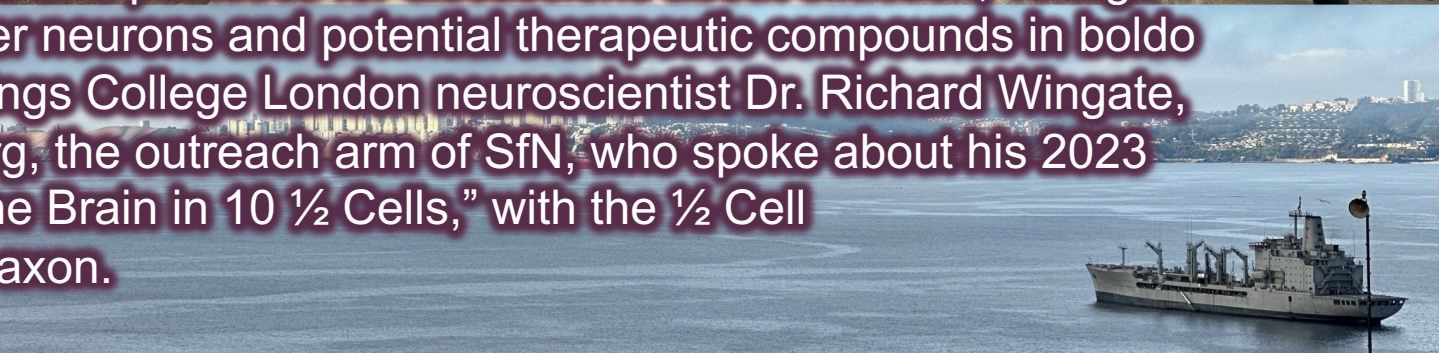
¡Gracias Dr. Jesús Olivares y Ale Rojas!



¡Gracias!

We met Dr. Ramón LaTorre and Dr. Juan Saez (members of the NAS), Dr. David Naranjo, Dr. Jesús Olivares, Dr. John Ewer and Dr. Kate Whitlock, and graduate students and postdocs for discussions about olfaction, voltage-gated channels, spider neurons and potential therapeutic compounds in boldo tea. We welcomed Kings College London neuroscientist Dr. Richard Wingate, Editor of brainfacts.org, the outreach arm of SfN, who spoke about his 2023 book, "The Story of the Brain in 10 ½ Cells," with the ½ Cell referencing the giant axon.

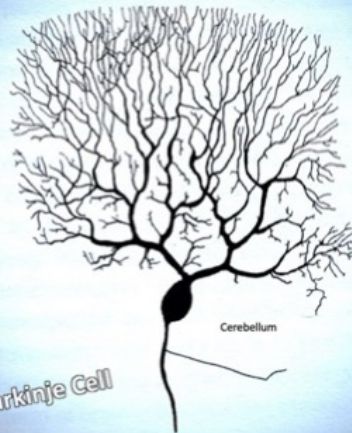
nwnoggin.org



THE STORY OF THE BRAIN IN 10¹/₂ CELLS

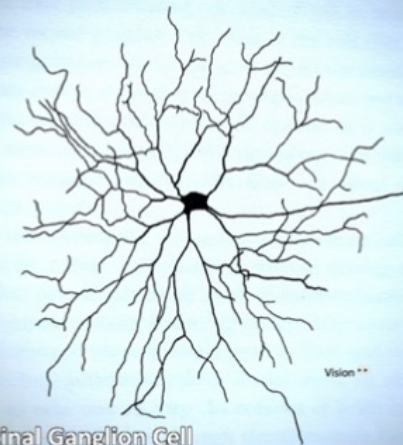
Richard Wingate

Purkinje Cell



Cerebellum

Retinal Ganglion Cell



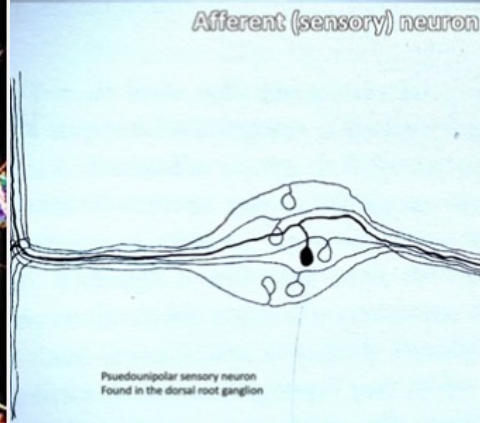
Vision **

Glial cell



Astrocyte

Afferent (sensory) neuron



Pseudounipolar sensory neuron
Found in the dorsal root ganglion

Invertebrate
sensory neuron



One of three types of
sensory neuron (a T-cell)
from a medicinal leech

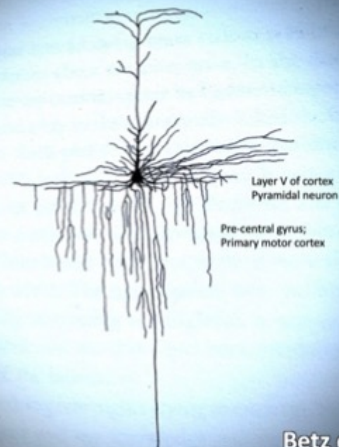
Archetypal neuron
by Lewellys Barker



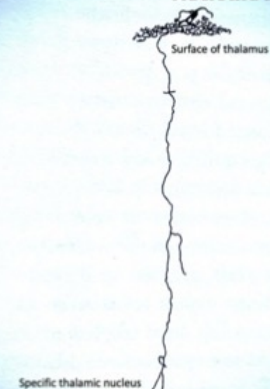
Recognize this cell?

FROM: The Story of the Brain in 10 ½ Cells, by Richard Wingate

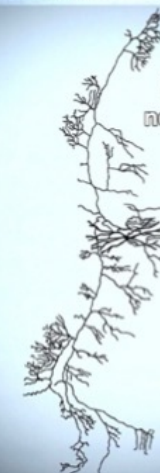
Reticulothalamic cell



Betz cell



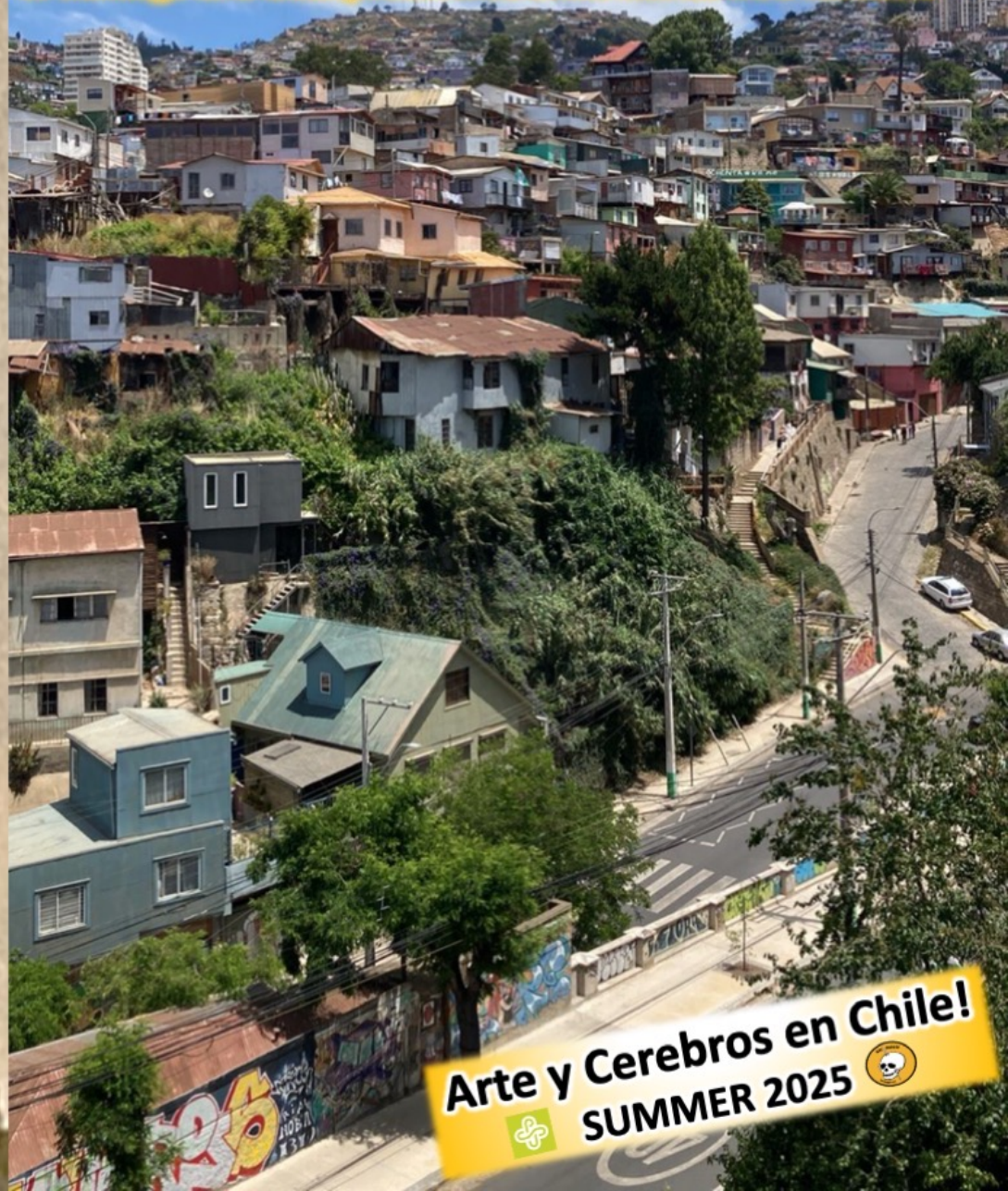
Giant reticular
neuron (a.k.a. the
Scheibel cell)



PHINEAS!



DID YOU KNOW that Phineas Gage lived in Valparaíso, Chile, after his infamous accident?! He drove a stagecoach from Valpo to Santiago and clearly recovered some frontal lobe function.



The bar that
shot through
the skull!

The skull



Arte y Cerebros en Chile!
SUMMER 2025 

Valpo is home to exceptional research, and is a celebrated center of public art. Street art was legalized in 1990 and eye-catching murales are everywhere.



June 28 – July 26, 2024
Arte y Cerebros en Chile!



¿Por qué las neuronas son bacánes?

Porque podemos cambiar la forma en que se conectan por lo que hacemos
Because we can change how they connect by what we do

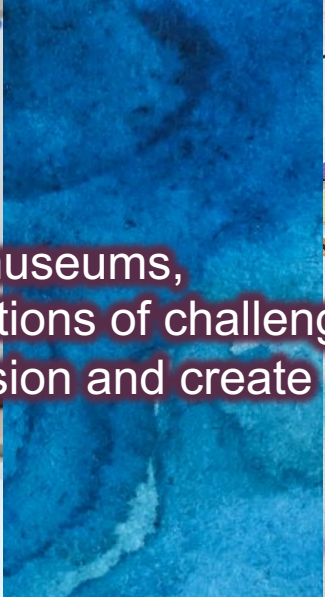
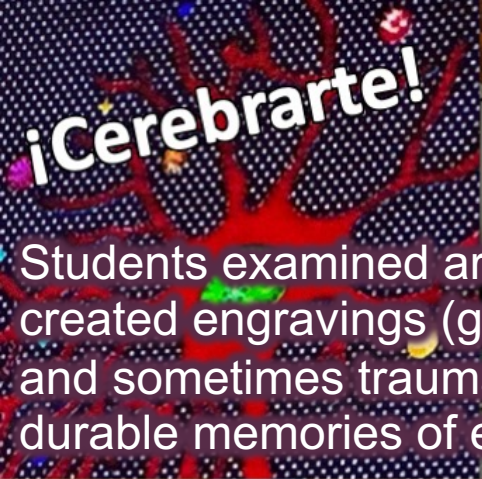
Porque nos permiten ver, oír, oler, gustar, tocar, sentir y hacer arte
Because they let us see, hear, smell, taste, touch, feel - and make art

Porque sus conexiones, llamadas sinapsis, crean redes que cuentan historias
Because their connections, called synapses, create networks that tell stories

Porque ellas son hermosas e inspiradoras
Because they are beautiful and inspiring

Porque aún nos queda mucho que aprender y descubrir de ellas
Because we still have so much to learn and discover

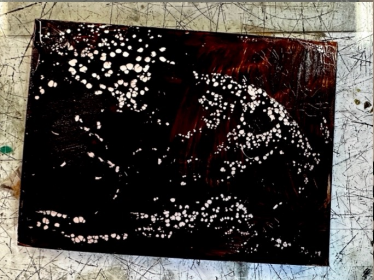
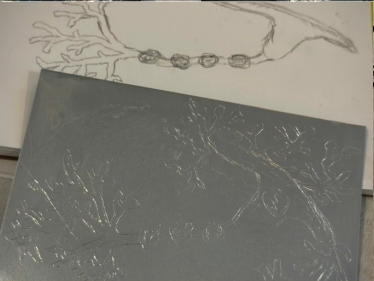




Students examined art with this cat called eddie, explored regional museums, created engravings (grabados), and sewed arpilleras, woven depictions of challenging and sometimes traumatic experiences that allow emotional expression and create durable memories of events with artist Cecilia Araneda.



ARTE GRABADOS



ARPILLERAS

"The cerros are colorful and of different textures, representing the different colored houses throughout the cerros of Valparaiso. In addition, I added women standing on the cerros to represent the battles and protests women face. The femininity of my arpillera is also meant to represent women on top of the figurines."



Arpillera by Alejandra Carrillo, Portland State University

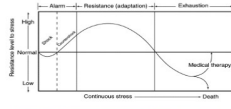
Study Interdisciplinary Neuroscience in Chile in 2025!



A Syndrome produced by Diverse Nocuous Agents
 EXPERIMENTS on rats show that if the organism is severely damaged by acute non-specific nocuous agents such as exposure to cold, surgical injury, production of spinal shock (transection of the cord), excessive muscular exercise, or intoxications with sublethal doses of diverse drugs (adrenaline, atropine, morphine, formaldehyde, etc.), a typical syndrome appears, the symptoms of which are independent of the nature of the damaging agent or the pharmacological type of the drug employed, and represent rather a response to damage as such.

Hans Selye proposed the initiation of a General Adaptation Syndrome in response to nocuous stimuli in 1936.

The stress response!
"It is not stress that kills us, it is our reaction to it..."
 - Hans Selye



HANS SELYE.
 Department of Biochemistry,
 McGill University,
 Montreal, Canada.
 May 18.
 © 1936 Nature Publishing Group

La Museo de Memoria y Humanos Derechos Santiago, Chile



We explored the neuroscience of perception, stress and trauma as it relates to personal experience (including aspects of culture shock), research, art and the 50th year since El Golpe, the US-backed coup that violently overthrew democratically elected President Salvador Allende in 1973.



The program culminated in a visit to Ciencia al Tiro, a STEAM outreach nonprofit where we made pipe cleaner brain cells and took them to the streets to speak with residents of Playa Ancha sobre porque las neuronas son bacanes (why neurons are cool).

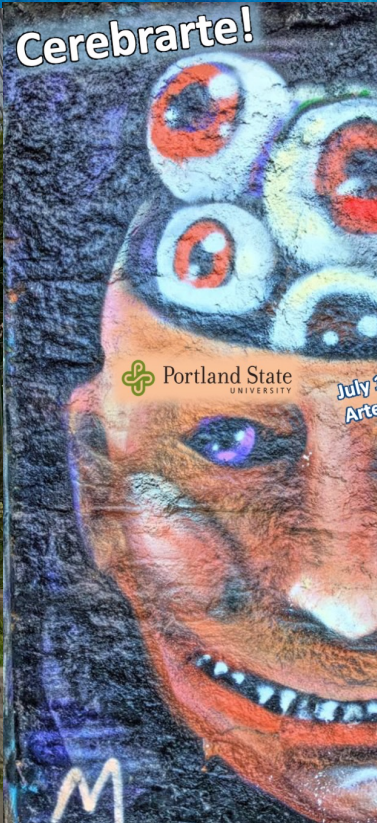


JOIN US!

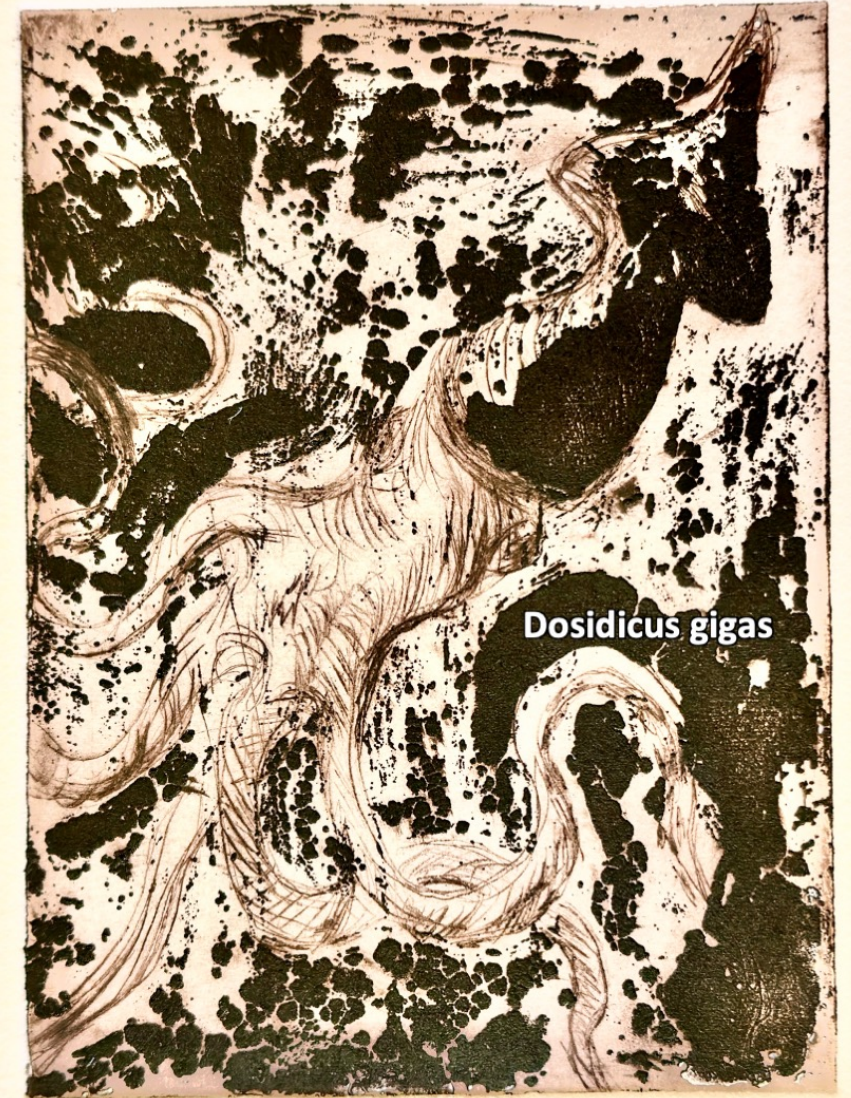
- EVERYONE WELCOME "SUMMER" 2025!
- THROUGH PSU EDUCATION ABROAD
- LINK @ NWNOGGIN.ORG



Cerebrarte was an exciting, interdisciplinary, intercultural, international experience, and will occur again in 2025.



El Calamar de Humboldt



Un grabado del 'Jefe' Leake Casaplan, Valparaíso, Chile