

**Brains, Hearts, Ships  
and Students: Signals from  
Noise on the Oregon Coast**



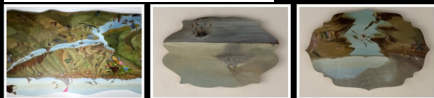
**Northwest  
Noggin**



**Noggin @ NAEOP 2023**

**[nwnoggin.org](http://nwnoggin.org)**

# Jeff Leake

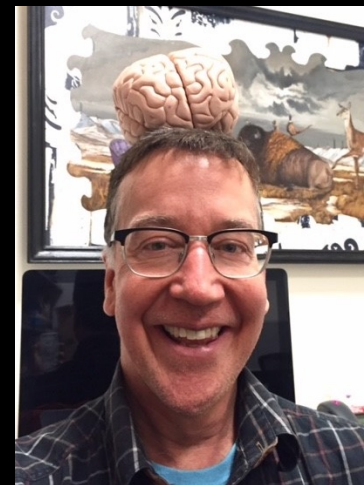


[jleake@pdx.edu](mailto:jleake@pdx.edu)

**Jeff Leake, M.A.**, artist and instructor in Psychology and University Studies, Portland State University; President, co-founder and Arts Coordinator of NW Noggin.



# Bill Griesar



[griesar@pdx.edu](mailto:griesar@pdx.edu)

**Bill Griesar, Ph.D.**, Teaching Assistant Professor, Portland State University; co-founder and Neuroscience Coordinator of NW Noggin; Affiliate Graduate Faculty, OHSU.



**NWNOGGIN**



**nwnoggin.org**

**Arts integrated neuroscience  
outreach for K-12 & community**



**ELEVEN YEARS!  
ALL VOLUNTEER (everyone)  
65,000+ community members**

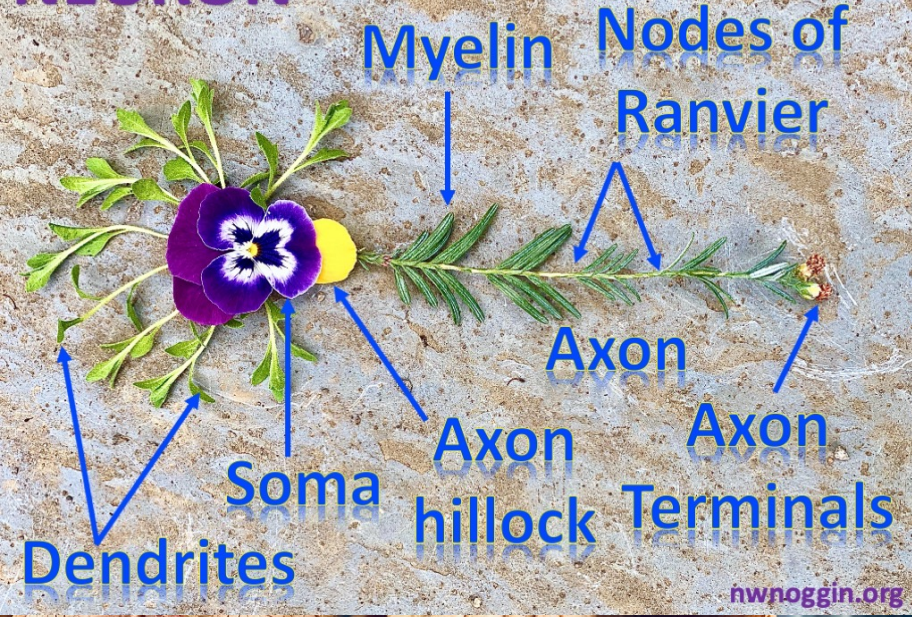




# Art & Brains!




## NEURON



[nwnoggin.org](http://nwnoggin.org)





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

*What you do  
has relevance  
**GO PLACES***



**We all pay for research**





**Greater understanding**  
**More support for research**  
**Increased participation**  
**Less confirmation bias**  
**New directions**  
**FUN!**

**Connections matter**



# BUILD NEW CONNECTIONS



- **Academic priority K-12, urban/rural communities, tribal majority schools**
  - Not always well-funded, or valued, often ignored, subjected to standardized testing that primarily benefits others. Complex brain development underway, unacknowledged diversity, racism, bias, police brutality, mental health,...
- **Young graduate researchers, undergraduates (Portland State University, OHSU,...)**
  - *How does my research relate to the world? How can I explain it? Where can I go from here?*
- **Houseless youth (p:ear), incarcerated youth (MacLaren/Coffee Creek Correctional Facilities)**
  - *“It’s like people see me as an object, not as a human being”*
- **Artists: Painters, Dancers, Storytellers, Musicians, Poets**
  - *How does my work relate to other fields? How do I connect with new audiences?*
  - *How is my practice influenced and enriched by discoveries about the brain?*
- **Community organizations**
  - TRIO, Area Health Education Centers (AHECs), American Brain Coalition,...
- **Area businesses (BioGift, Intel, Fort George Brewery, Portland Art Museum)**
  - *How can we better connect with everyone in our community?*
- **Members of the public**
  - *Why are my taxes spent on research? Art? What are we discovering? Making?*



**Oh the places  
you'll go!**



# Why art & brains..?

- Motivation, engagement, **empathy**
- Exploration, creativity, **INNOVATION**
- **Personal relevance of STEAM material**



## Build your own mouse line!



N.W. Noggin  
@NWNoggin

Building a #rosehipneuron in  
#pipecleaners 🧡 #nwnoggin 🧠🎨  
#sciart #scicomm 🦋  
[nwnoggin.org/2018/08/31/ros...](https://nwnoggin.org/2018/08/31/ros...)





To see other people



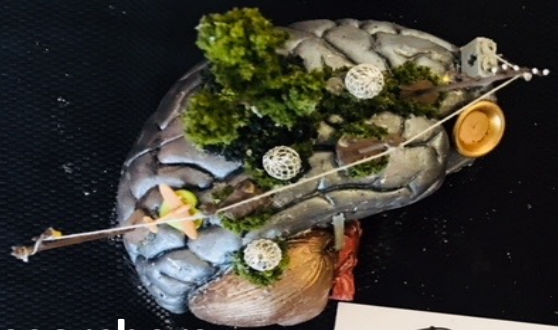
# HOMELESSNESS & THE BRAIN

Thurs, Oct 19th  
10am - 1pm



p:ear

Researchers  
Clinicians  
Policy makers  
Houseless youth



Bunny:  
"we are all  
connected"

p:ear mentor gallery  
338 NW 6th Ave

[nwnoggin.org](http://nwnoggin.org) [pearmentor.org](http://pearmentor.org)

STREET KIDS  
ART  
NEURO-  
SCIENCE



# Rural Outreach

*TO GO PLACES!*

Siletz, Amity &  
Willamina, OR  
Pop: 4,000

Davenport, WA  
Pop: 1,700

La Grande, OR  
Pop: 13,000

Heppner & Ione, OR  
Pop: 1,240

Meservy  
Meadows,  
OR Pop: ~40



Food, housing, baby goats...





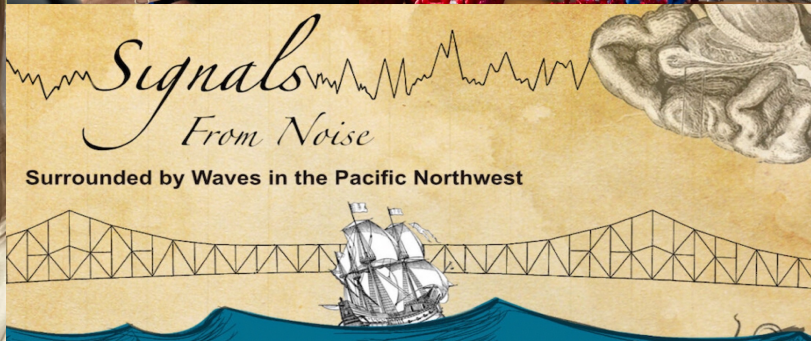
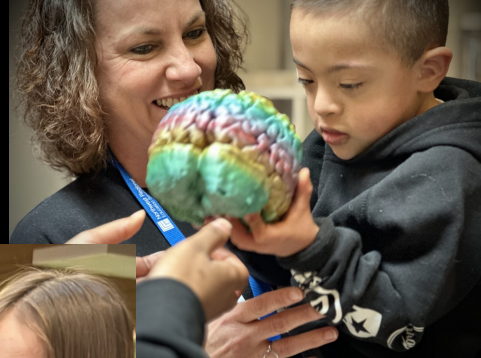
# Synapses, Stories and Song!



# Tribal majority schools



# Noggin + TRIO



Oregon Coast Spring, 2023



# Noggin + TRIO

## Noggins on the Coast

Community  
Connections

**NOGGINS ON THE  
OREGON COAST 23**

*Y Dormitory, Astoria*

[nwnoggin.org](http://nwnoggin.org)



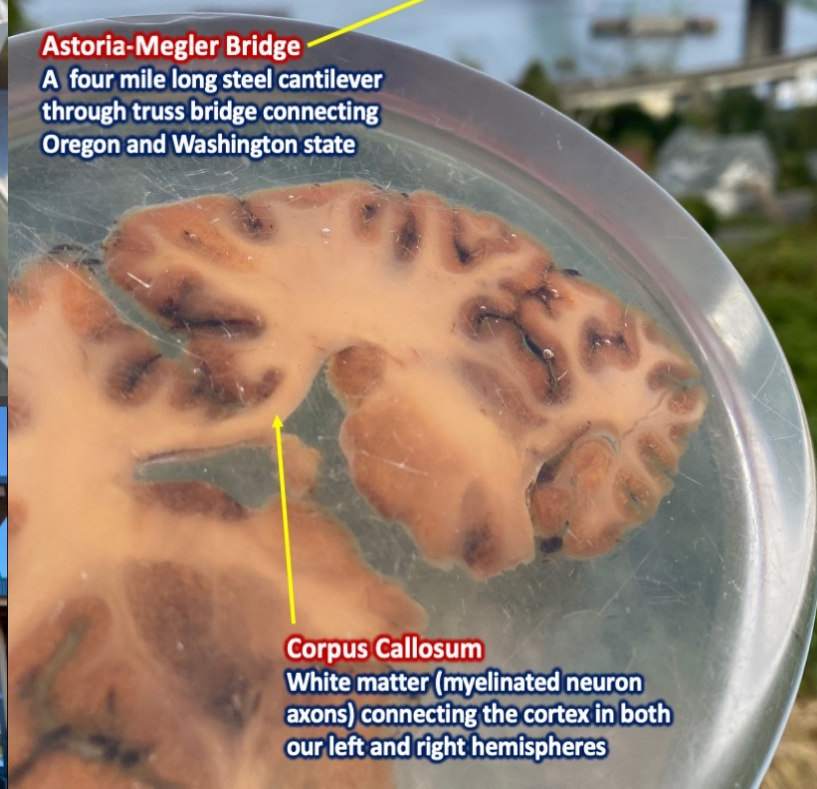
*Fort George Brewery, Astoria*



*Astoria Coop*



*Peter Pan  
Market, Astoria*



**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



**THANK YOU FOR SUPPORTING  
ART/NEUROSCIENCE OUTREACH!**



# Noggin + TRIO

*A Columbia river bar pilot, a cardiology PA, and a neuroscientist walk into a bar...*





# Noggin + TRIO



N.W. Noggin  
@NWNoggin



“What does brain research say is the best way to lower anxiety? How do brainwaves relate to mood & stress? Could you grow a new brain or heart & then transplant it? Can you tell if someone has a brain disorder by looking?” 🧠🔬😊

#nwnoggin @ Knappa 📍 [nwnoggin.org/event/noggins-...](https://nwnoggin.org/event/noggins-...)







N.W. Noggin  
@NWNoggin

“What causes that feeling of #paralysis as you’re falling asleep? Does #daylightsavingstime affect sleep? Why is #sleep important for #brains? What brings on #nightmares?”

#nwnoggin @ #astoriaoregon high school  
🎨👉 [nwnoggin.org/event/noggins-...](https://nwnoggin.org/event/noggins-...)

#outreach #allvolunteer ❤️



N.W. Noggin  
@NWNoggin

“Can you get a #concussion in your #entericnervoussystem or #microbiome? Is the #brain like a computer? What part of the brain is involved w/#rhythm & making your foot tap? Do you ever see a brain that’s smooth?”



N.W. Noggin  
@NWNoggin

“I saw #mycelium in the forest and it looks like #brain cells 🍄! I think my #brain learns through stories” 🤗  
🧠👉🐼🤗! Yes ❤️

Some of the deepest insights and questions from #preK today 😊😊

#nwnoggin #oregoncoast 🐦🌊👉👉  
[nwnoggin.org/event/noggins-...](https://nwnoggin.org/event/noggins-...)



N.W. Noggin  
@NWNoggin

“Does #alcoholism run in families? How does smoking cigarettes affect the brain? What about #cannabis? What happens in your #brain if you have #ADHD? #DID? Why are drugs more dangerous for kids?”

GREAT QUESTIONS @ Seaside Middle School 🧠👉  
[nwnoggin.org/event/noggins-...](https://nwnoggin.org/event/noggins-...)






# Neuroscience & Law

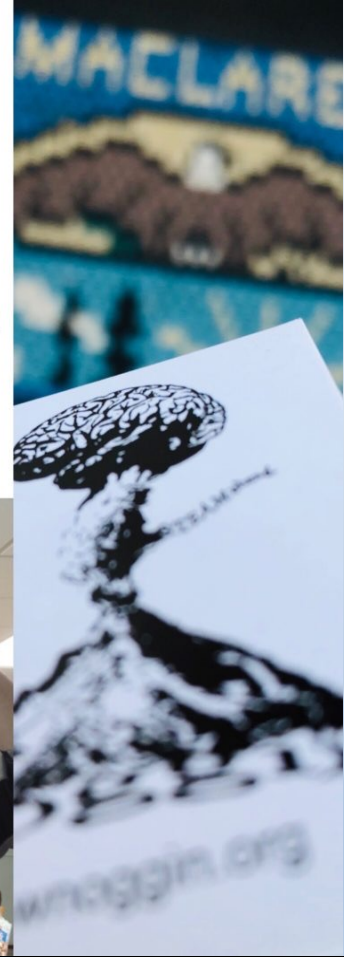
To listen, learn, empower & make change



## 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.

 Lindsay Keefe on January 24, 2019



MacLaren Youth Correctional Facility





**At SfN conferences**



**Posters, art of neuroscience *and...***





**Public School visits**

**Public outreach and connection**



# *And also to Capitol Hill*

More connections: Congressional office visits  
Congressional Neuroscience/STEAM briefing

“Bipartisan”  
neuron



Research should inform policy



# NOGGINFEST!

Music, art, research,  
brains, all ages, FREE

## Noggin Fest 2023

### SCHEDULE OF EVENTS

4:00 - 6:00pm

Art and BRAINS!

6:00 - 8:25pm

NOAH MILLMAN, Oregon Health & Science University

"Loss of sleep when its needed most - Consequences of persistent developmental sleep disruption: Lessons from prairie voles"

6:30 - 6:55pm

LO 910

7:00 - 7:25pm

AUSTIN SCHURCKE, Oregon Health & Science University

"Brains In a Dish: What Cortical Organoids can Teach us about Brain Development, Pliability, and Evolution"

7:30 - 7:55pm

CAFE MEASLES

8:00 - 8:25pm

KOKANNE BAHN-BALES AND BLAKE LEE, Oregon State University

"Brain biology: What sheep and mice neurons are teaching us about our own reproductive axis"

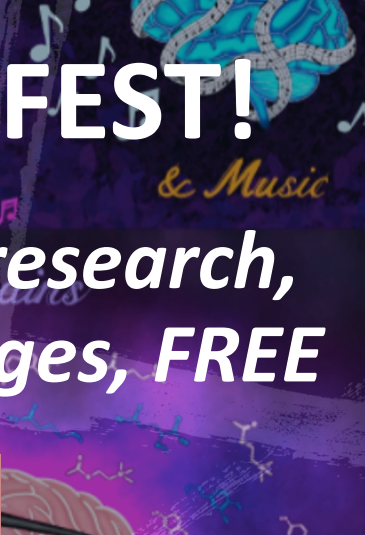
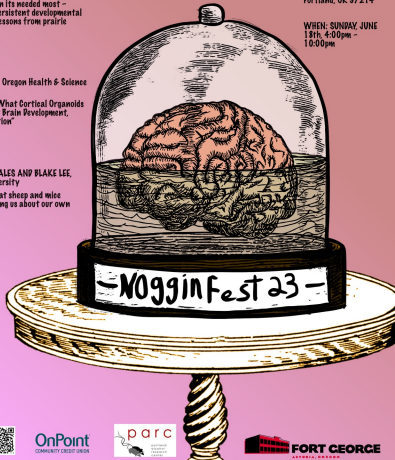
8:30 - 8:55pm

WOLF

JOIN US: This is the largest student-run, accessible, public celebration of music, art and interdisciplinary neuroscience in the Pacific Northwest! And it's FREE!!

WHERE: Honey Latta Cafe, 1089 SE Main St, Portland, OR 97214

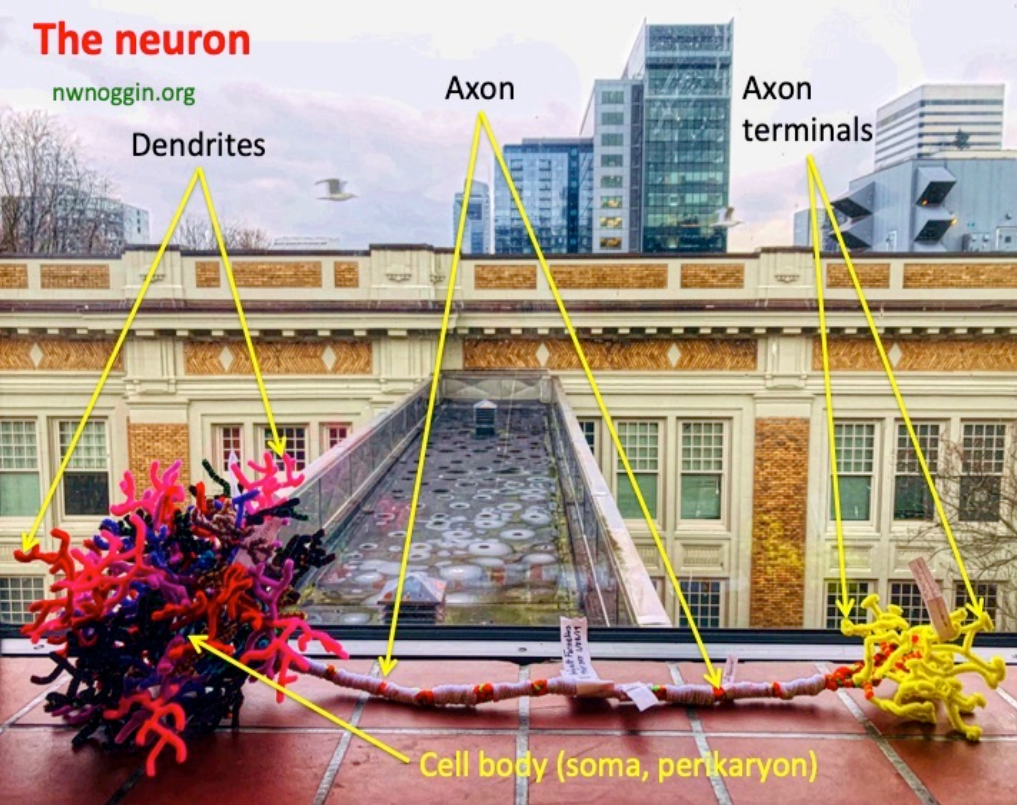
WHEN: SUNDAY, JUNE 18th, 4:00pm - 10:00pm





# The neuron

nwnoggin.org



MAKE YOUR OWN: Details @ [nwnoggin.org](http://nwnoggin.org)

# Pipe cleaner brain cells!



## Making a pipe cleaner neuron...

1. Start with a good amount of (colorful) pipe cleaners, I have 20 here.



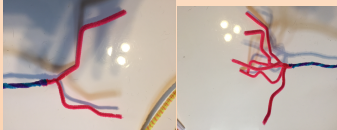
2. Create the soma or cell body by linking several pipe cleaner hoops together.



3. Attach dendrites to your soma by wrapping them around the soma pipe cleaners.



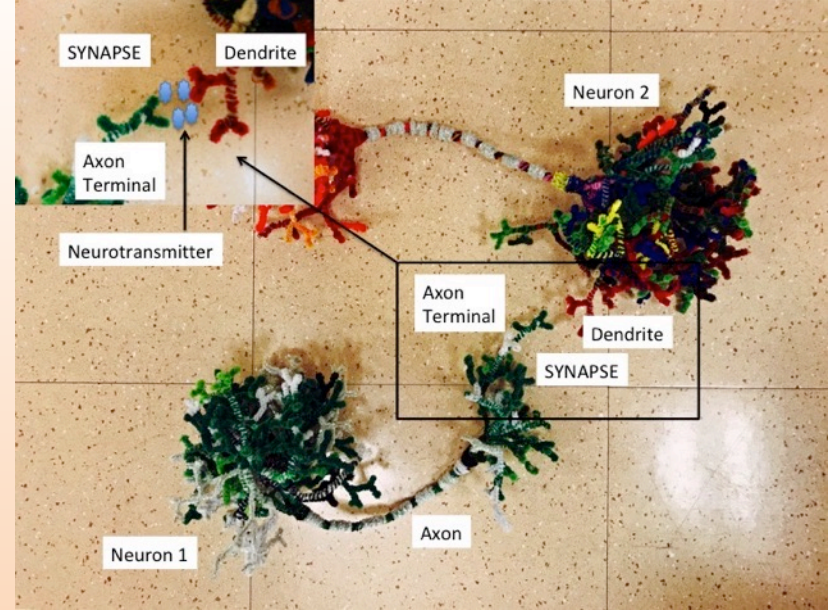
4. Attach axon terminals to the other end of your axon.



5. Wrap myelin around your axon.



6. Create a nucleus for your soma by wrapping two pipe cleaners around each other. Attach your nucleus inside your soma. You have a neuron!



# MAKE CONNECTIONS

# MAKE ART





## Neurons are a type of brain cell

The majority of neurons share some basic features

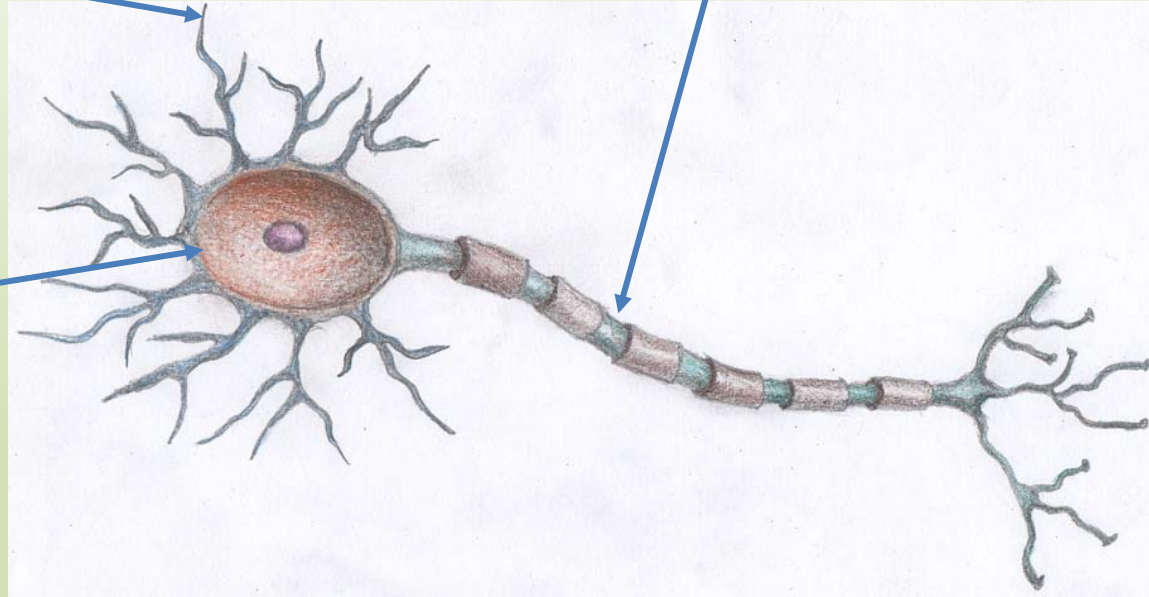
### Dendrites

(Receive input from other neurons at gaps called **synapses**)

### Cell Body

(or Soma, location of **nucleus** and cell **DNA**)

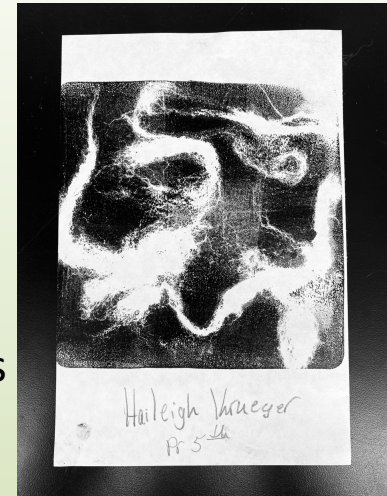
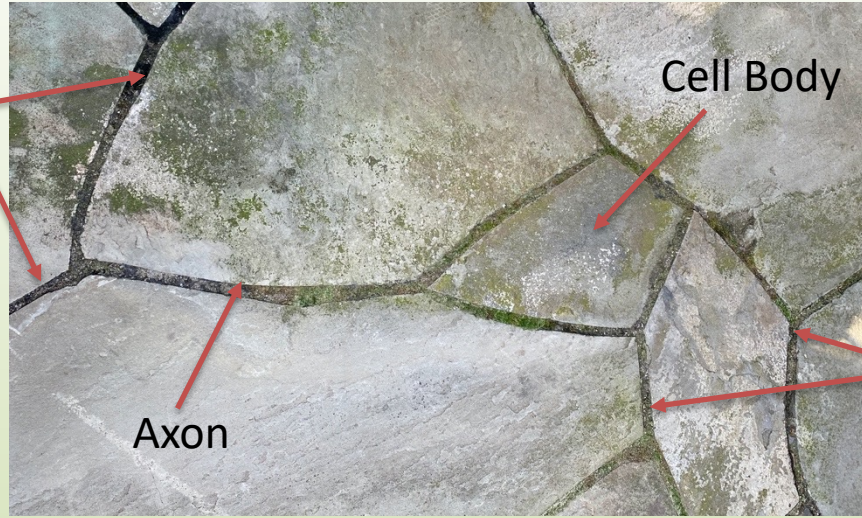
### Axon (Carries electric message)



# Found Object Brain Cells

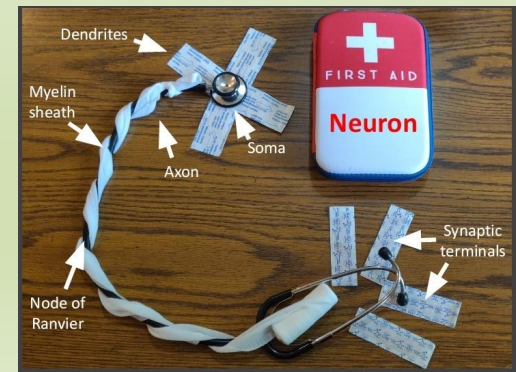


Take a look around you, what things do you see that share those structures?



Can you construct a neuron out of things that you find?

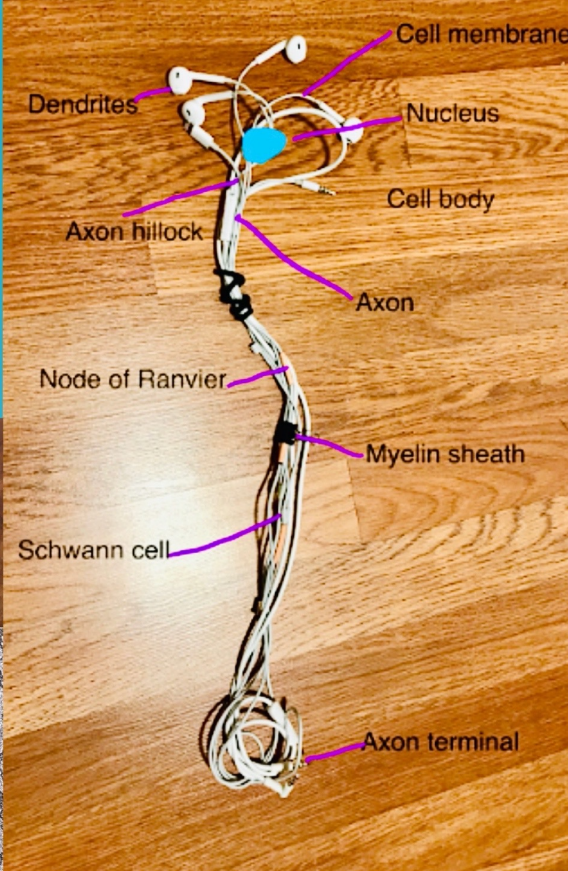
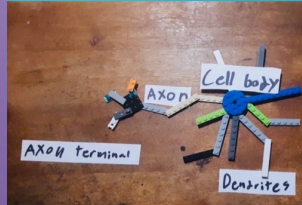
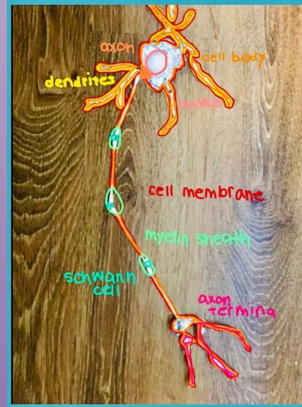
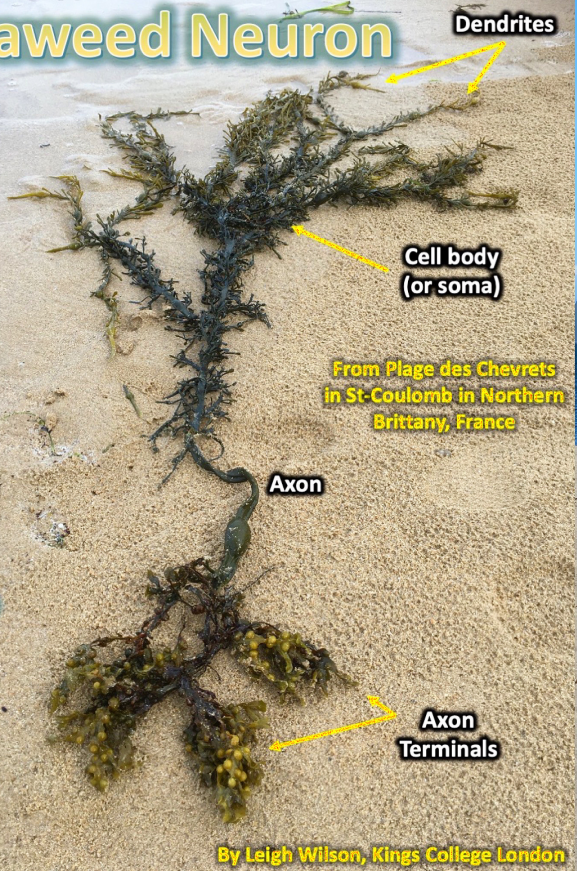
What things for you represent the function of a neuron? Or the function of specific parts of a neuron? Do those things have personal meaning, or say something about you?





# Seaweed Neuron

#showusyourbraincell



# #showusyourbraincell



# Neuron



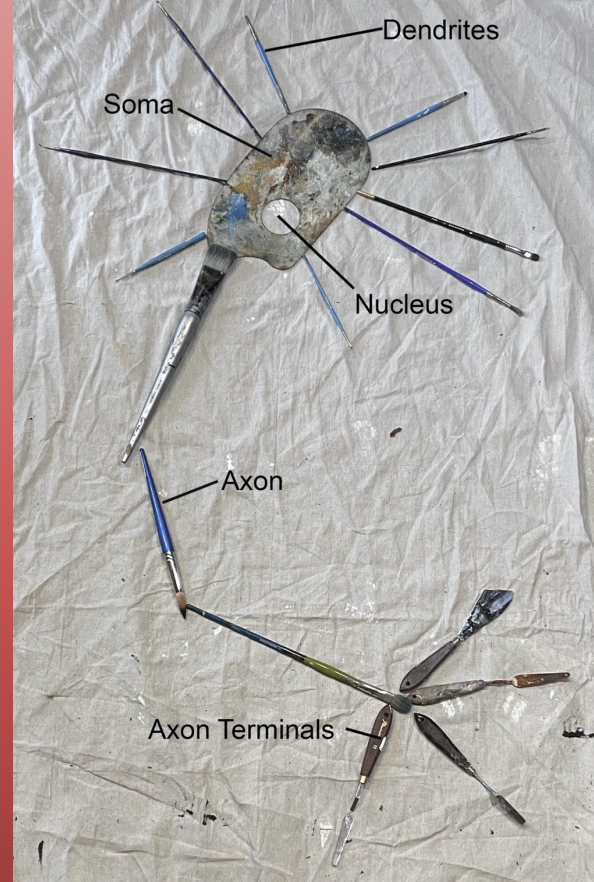
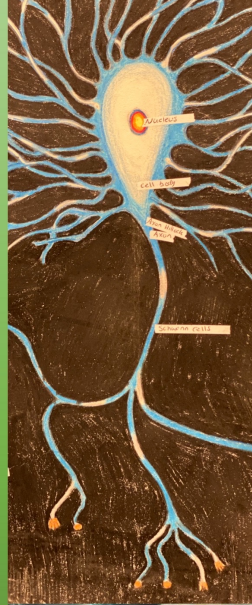
Dendrites

Soma

Axon

Axon terminals

#showusyourbraincell



Dendrites

Soma

Nucleus

Axon

Axon Terminals



By James & Mark  
Rutledge-Gorman

# #showusyourbraincell



# Tuna Jig Neuron

#showusyourbraincell



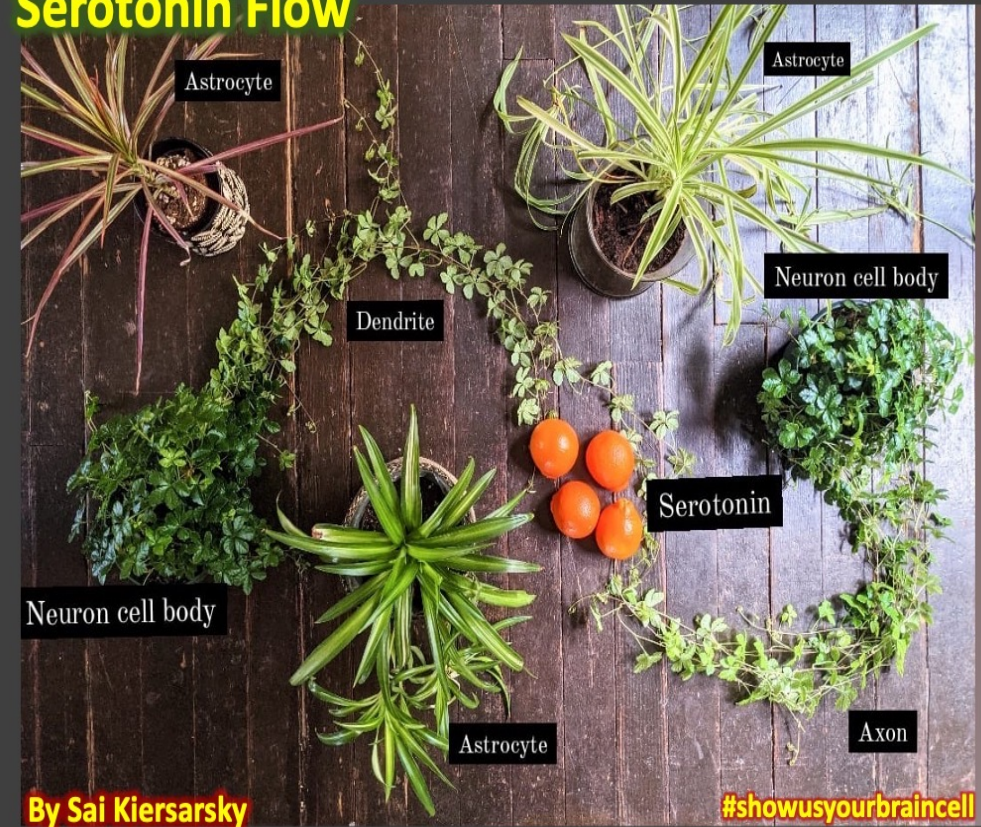
Jigging is a type of fishing where your boat stays in place, or slowly drifts, while the line is jerked up and down to imitate the swimming of prey

In Oregon, tuna jigs are primarily used for trolling, a style of fishing where you pull hooks through water behind your boat

LEARN MORE  
<https://Seagrant.oregonstate.edu>

By Amanda Gladics,  
Oregon Sea Grant, OSU

# Serotonin Flow



By Sai Kiersarsky

#showusyourbraincell

# #showusyourbraincell



**ANY BRAIN CELLS**  
Astrocyte  
Pyramidal neuron  
Photoreceptor  
Inner hair cell  
Nociceptor  
Cerebellar granule cell  
Meissner's corpuscle

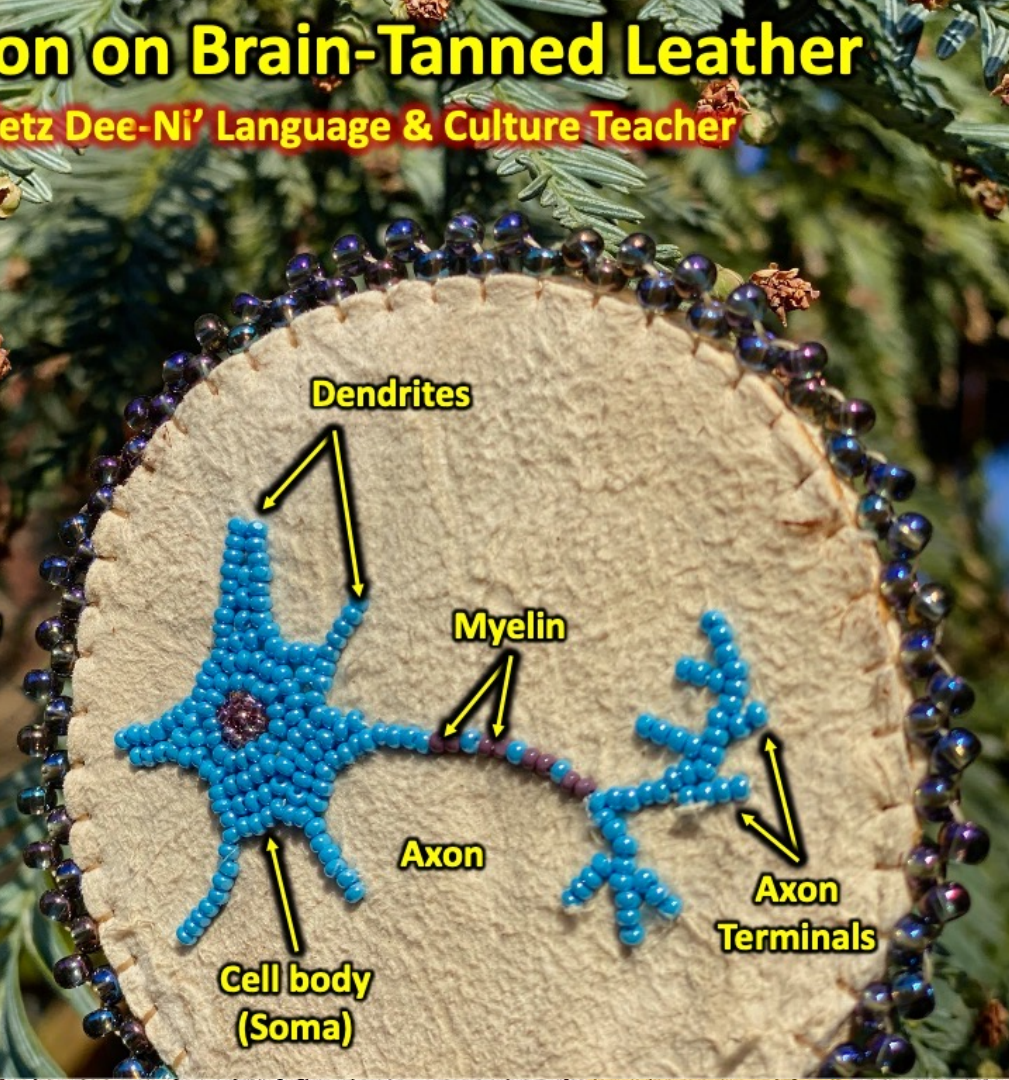


# Beaded Neuron on Brain-Tanned Leather

By Theresa Smith, Siletz Dee-Ni' Language & Culture Teacher

*"Every animal has enough brains to tan its own hide"*

#showusyourbraincell  
nwnoggin.org







#showusyourbraincell

# #showusyourbraincell

Gorgeous hand-crafted photoreceptors by artist Darrin Lane

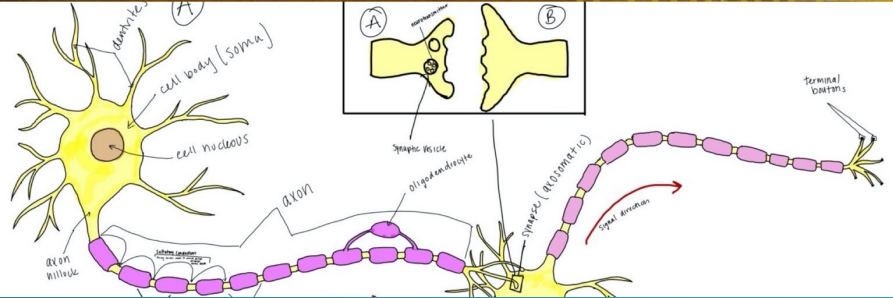
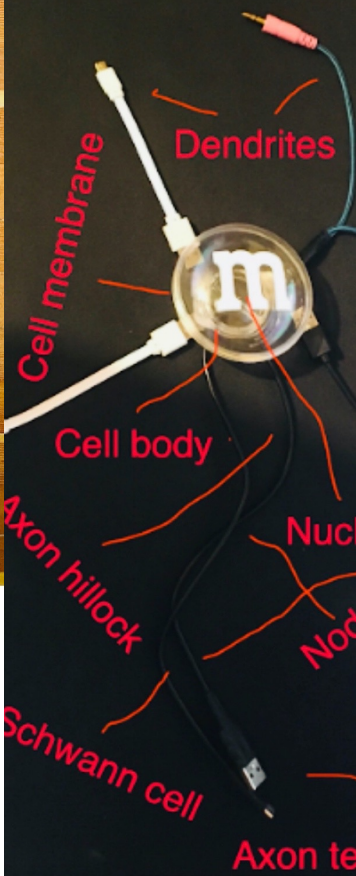
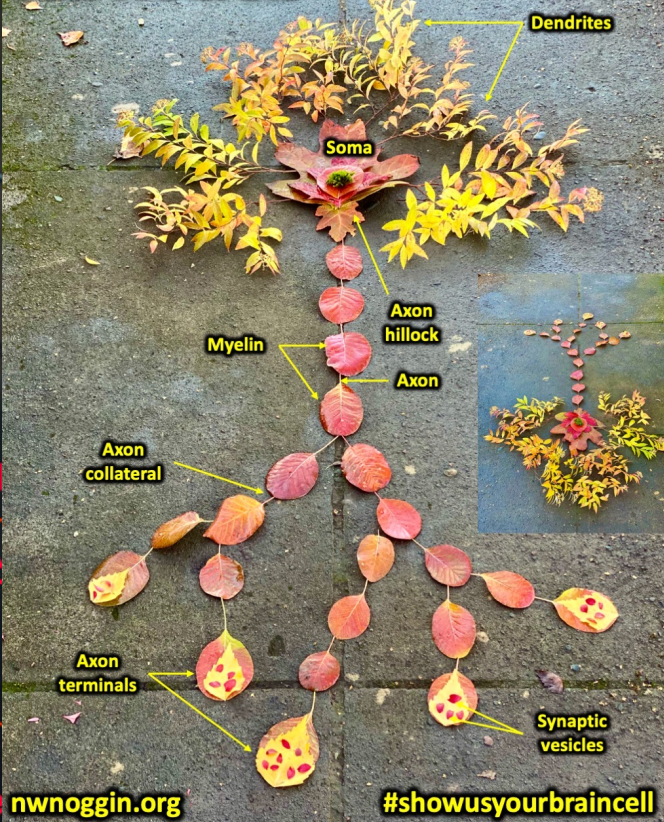
nwnoggin.org



# Neuron from the coat rack



# Fall Neuron



www.nwnoggin.org

#showusyourbraincell

# #showusyourbraincell



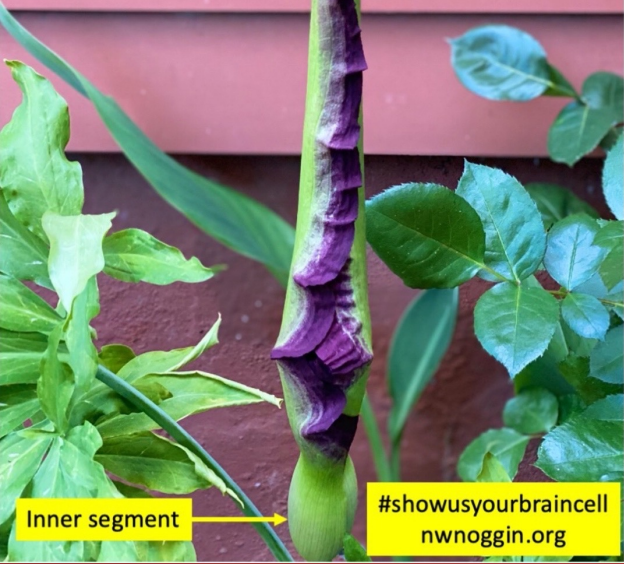
# Dracunculus Vulgaris

Smells like rotting flesh  
Pollinated by flies

Or...retinal cone cell?

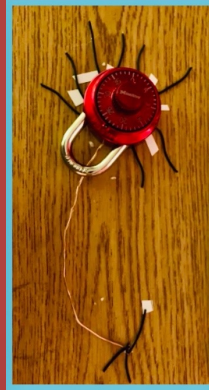
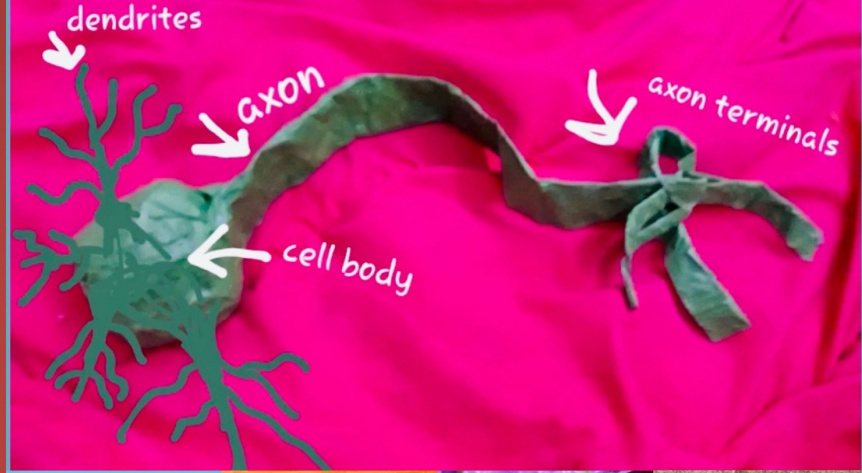
Membranous disks  
(sites of photopigment)

Outer segment



Inner segment

#showusyourbraincell  
nwnoggin.org



# #showusyourbraincell



# Taste afferent

Taste afferents are arranged like sections of an in **taste buds** on your tongue, with tiny **microvilli** poking out of **taste pores** for detecting chemicals (**tastants**) in food.



nwnoggin.org

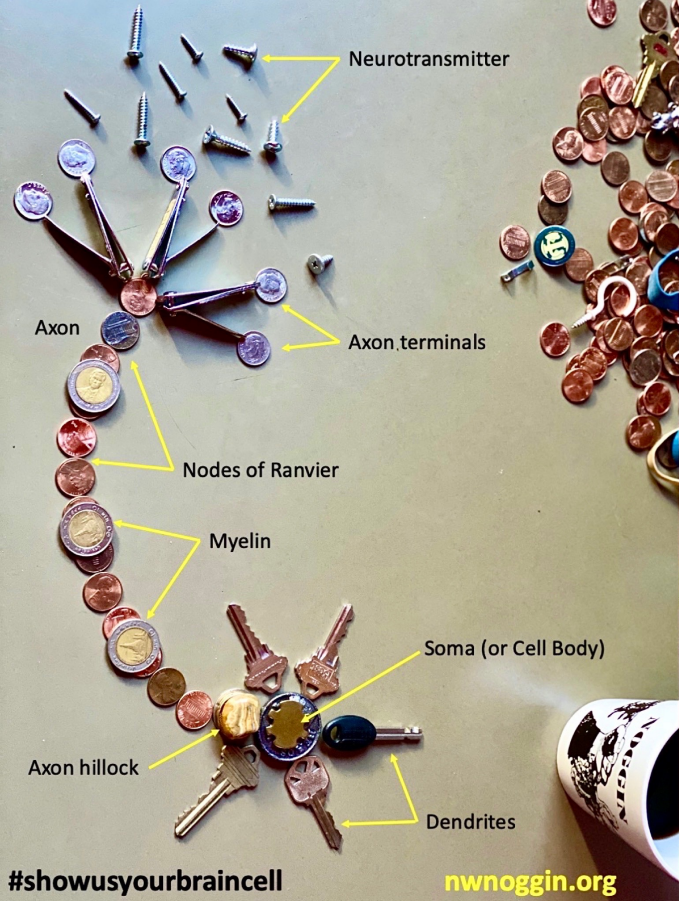


#showusyourbraincell



# #showusyourbraincell

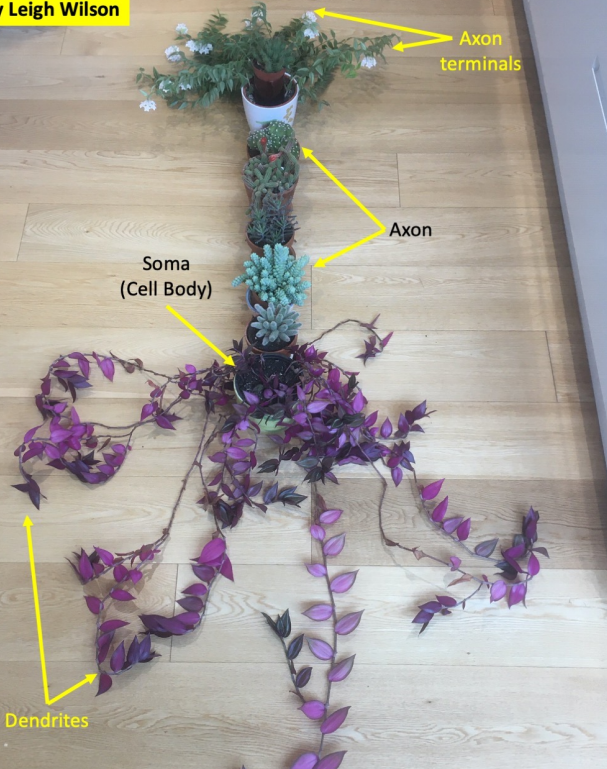




# #showusyourbraincell



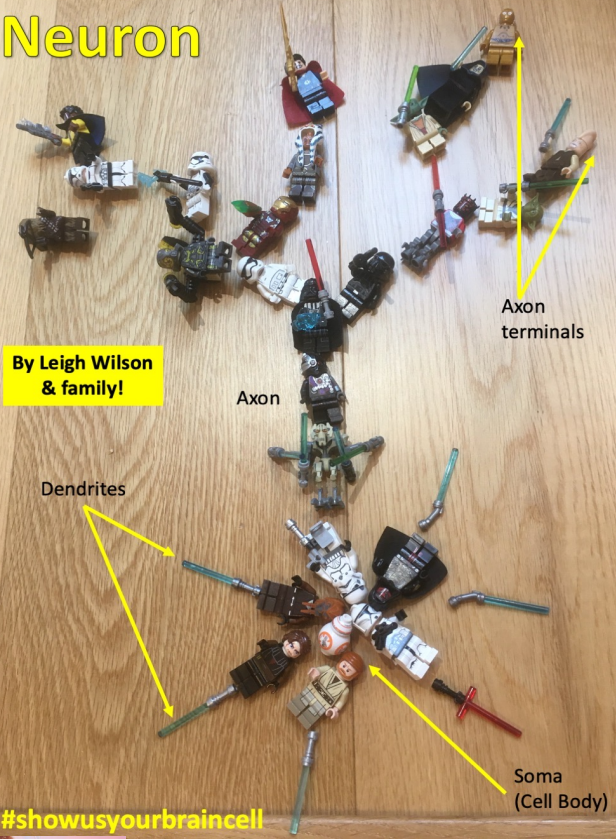
By Leigh Wilson



Neuron

#showusyourbraincell

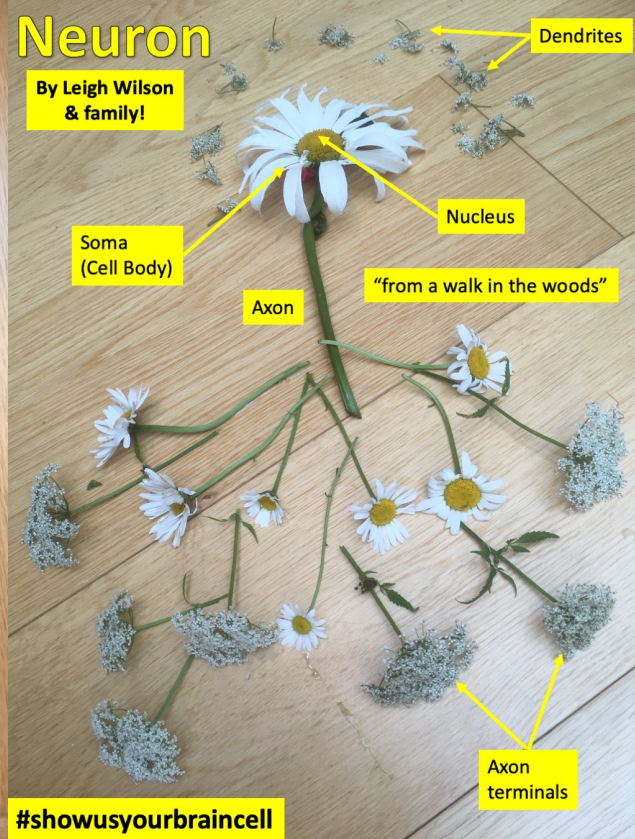
Neuron



#showusyourbraincell

Neuron

By Leigh Wilson & family!



#showusyourbraincell



#showusyourbraincell



# Tear Gas Neuron

Portland Police collaborated with white nationalist gangs & used chemical weapons of war on citizens

**Portland Police**, county sheriffs, Oregon state troopers, federal DHS officers & armed members of regional hate groups **attacked Portlanders** & **press** with tear gas & impact munitions **for more than \*5\* months in 2020**.

Chemicals in tear gas cause and worsen respiratory ailments

Portland Police Bureau officers used force "more than 6,000 times" during "crowd-control events" from 5/29 - 11/15 - U.S. Department of Justice

These dendrites are clips from CS gas canisters deployed by the Portland Police, **under Police Commissioner & Mayor Ted Wheeler**, against people protesting ongoing racism and police violence against BIPOC Americans.

Portland, OR 2020

nwnoggin.org

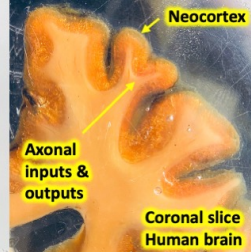
#showusyourbraincell



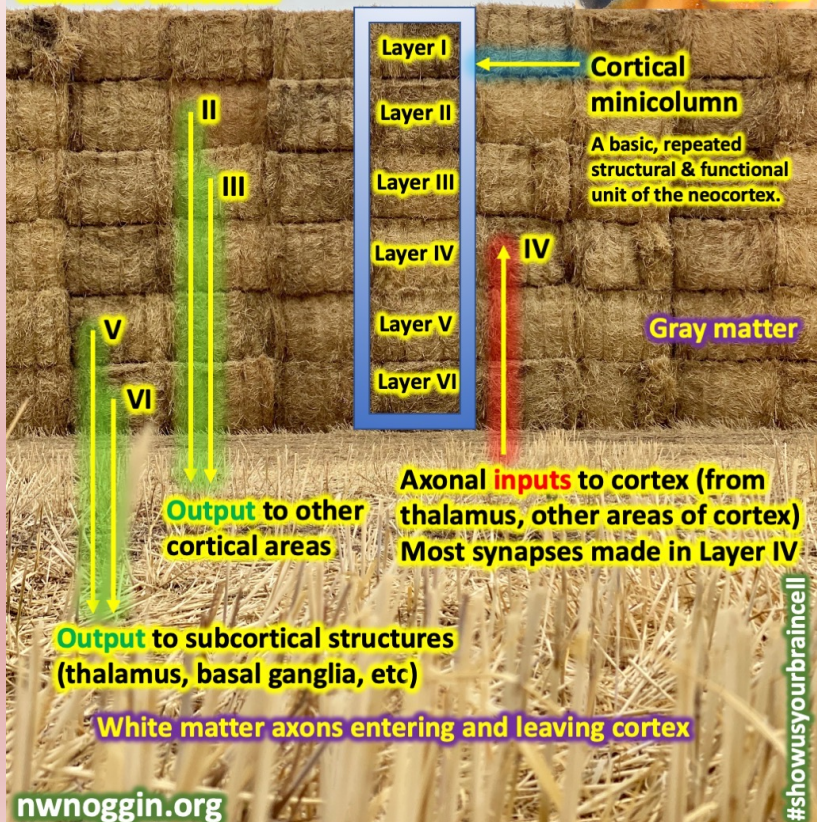
#showusyourbraincell

# NEOCORTEX

From straw bales in Union County, Oregon



Surface of neocortex



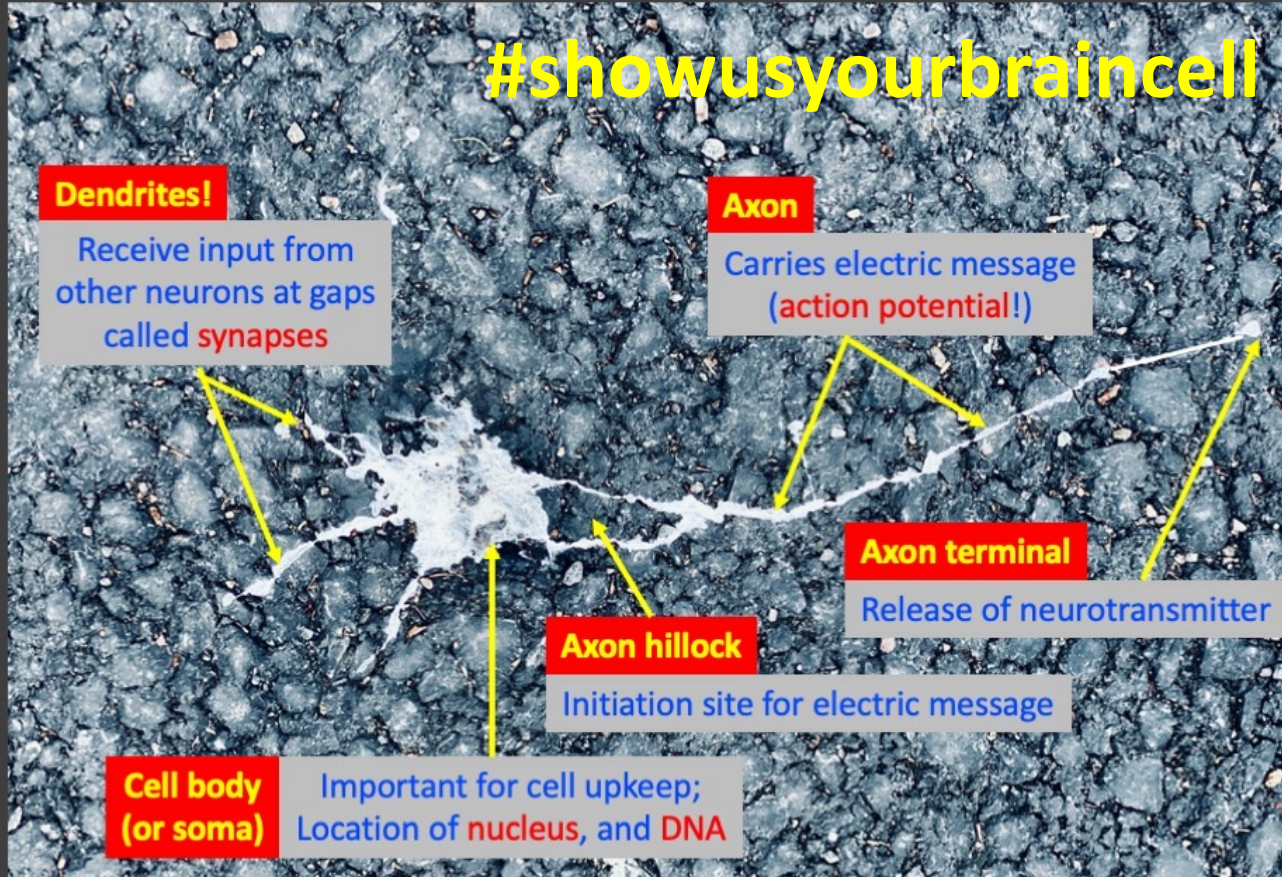
nwnoggin.org

#showusyourbraincell



# You can find neurons everywhere!

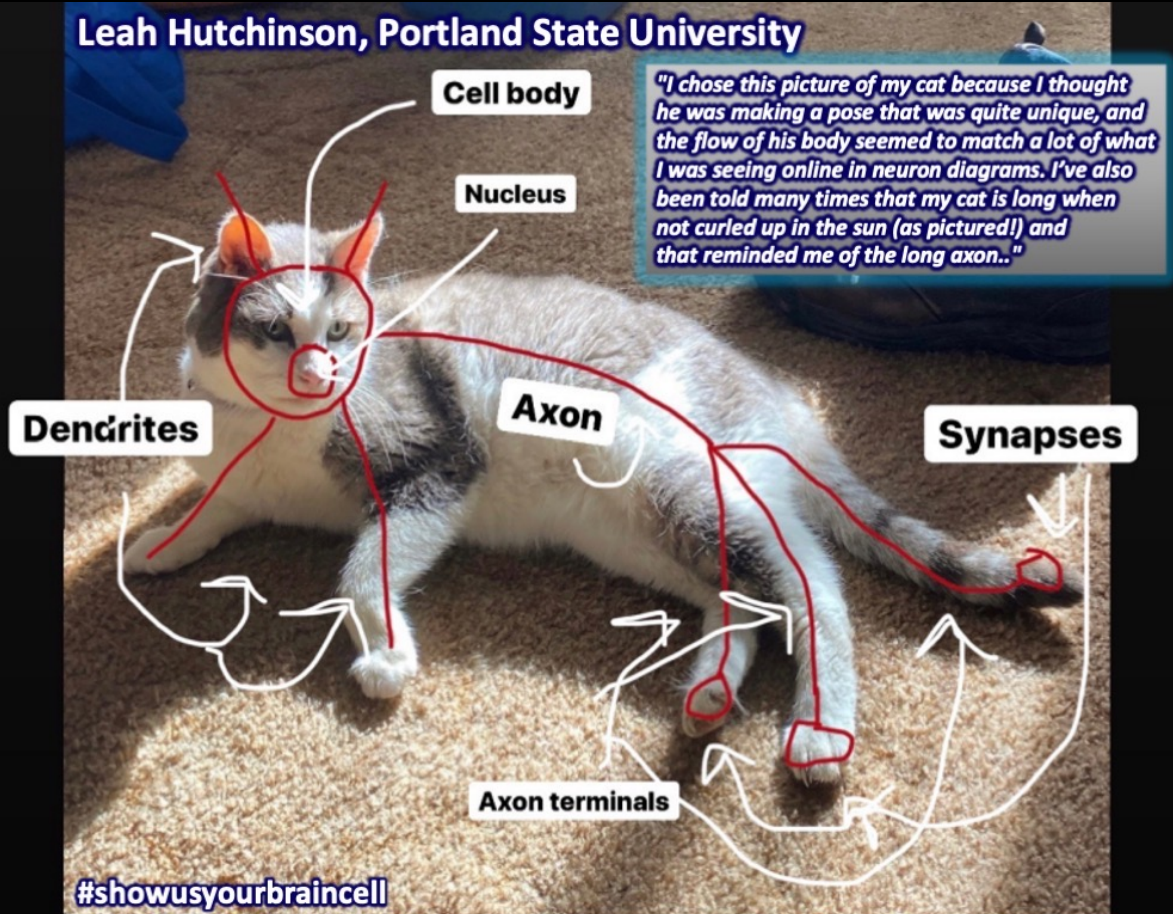
#showusyourbraincell





# Everywhere!

Leah Hutchinson, Portland State University

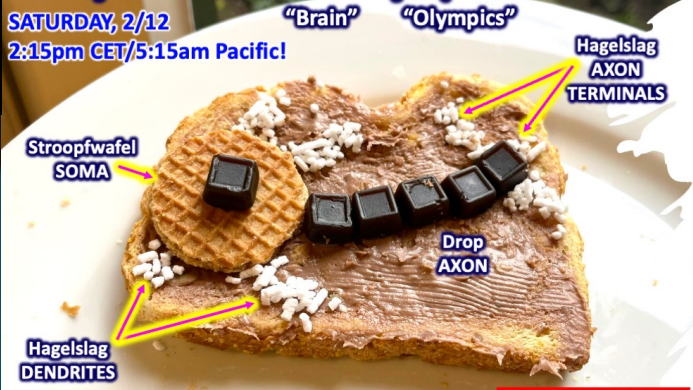


"I chose this picture of my cat because I thought he was making a pose that was quite unique, and the flow of his body seemed to match a lot of what I was seeing online in neuron diagrams. I've also been told many times that my cat is long when not curled up in the sun (as pictured!) and that reminded me of the long axon.."

#showusyourbraincell

## Ready for the Hersenolympiade!

SATURDAY, 2/12  
2:15pm CET/5:15am Pacific!



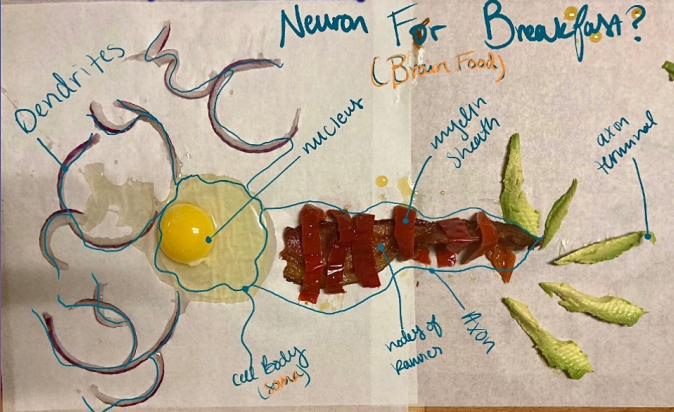
Northwest Noggin will discuss (and exhibit!) real brains, art and the intersection between the two. Join us to make your own found object brain cells and discover how the arts and neuroscience offer compelling insights into who we are.

**DUTCH NEURON**  
By Austin Howard

nwnoggin.org

#showusyourbraincell

Victoria Peterson, Portland State University

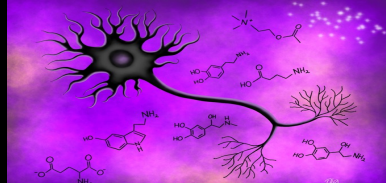


"I've always kind of thought the Soma of a neuron looked like a cracked open egg, which I spend a LOT of time looking at because I work at a cafe where we make a lot of egg sandwiches..."

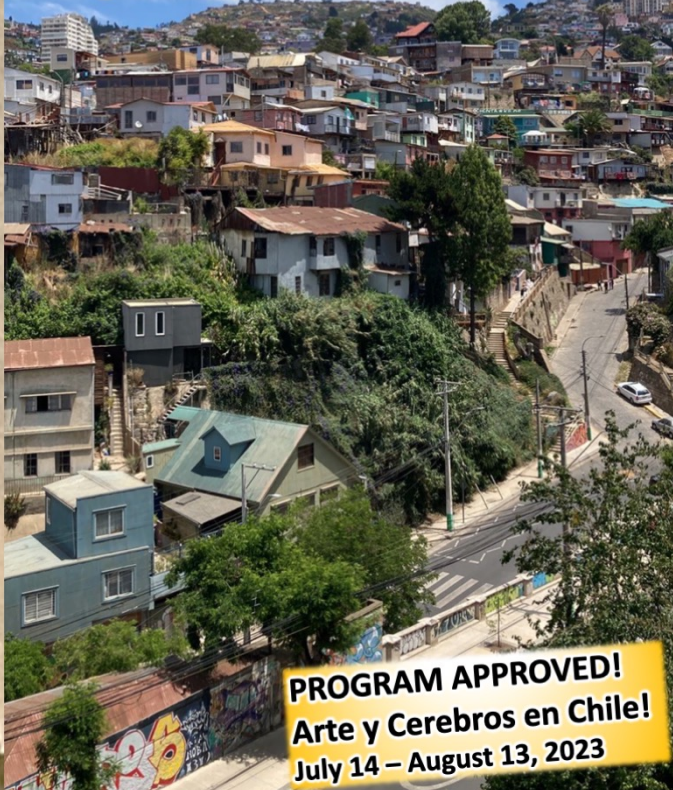
#showusyourbraincell



# Make your own – AND SHARE!



*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.



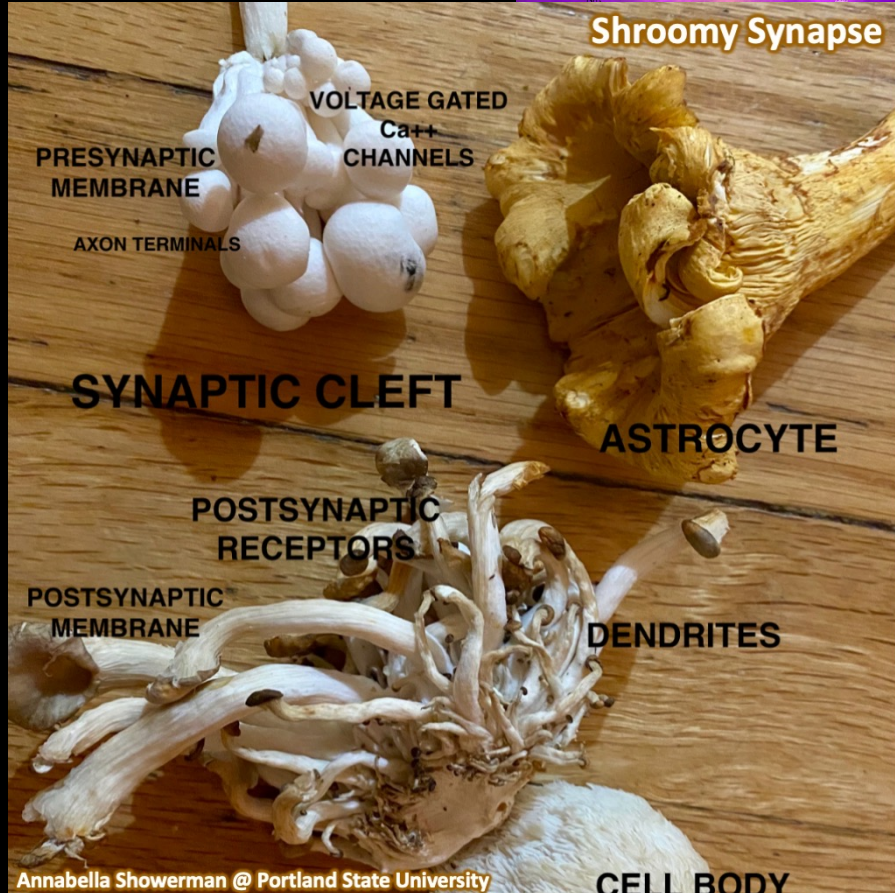
The bar that shot through the skull!

The skull



**PROGRAM APPROVED!**  
Arte y Cerebros en Chile!  
July 14 – August 13, 2023

#showyourbraincell



Annabella Showerman @ Portland State University