

Letting Knowledge Serve through interdisciplinary neuroscience (& a few extra brains!)

- *How do we inspire and learn from ALL our students? How do we inspire and learn from our community?*
- Northwest Noggin (nwnoggin.org) : community, neuroscience and art
- TODAY: Discover what we've done and learned, and meet accomplished Portland State outreach participants.



@ This Moment, January 2022

Jeff Leake



Jeff Leake

Artist, Instructor at
Portland State University
Co-Founder, NW Noggin

Jeff Leake, M.A. currently teaches interdisciplinary art and neuroscience courses in the Psychology and University Studies departments at PSU. He is also the president, co-founder and arts coordinator of the nonprofit NW Noggin. A working artist, Jeff has completed prestigious residencies in Shanghai, Nevada and Wyoming (UCross), and is currently heading to Latvia in February 2022. He has traveled the country lecturing and teaching neuroscience through art and was recognized as an innovator by the Obama White House.

Bill Griesar



Bill Griesar

Senior Instructor at
Portland State University
Co-Founder, NW Noggin

Bill Griesar, Ph.D. is Senior Instructor in Psychology at PSU and a co-founder and Neuroscience Coordinator of NW Noggin. He has developed and taught arts-integrated neuroscience courses at PSU and OHSU since 2001 and helped create a new interdisciplinary neuroscience minor at PSU. Through NW Noggin he's met with more than 50,000 K-12 students over real brains and art. He's been recognized as an innovator by the Obama White House and has won numerous teaching awards.

NWNOGGIN



nwnoggin.org

Arts integrated neuroscience
outreach for K-12 & community

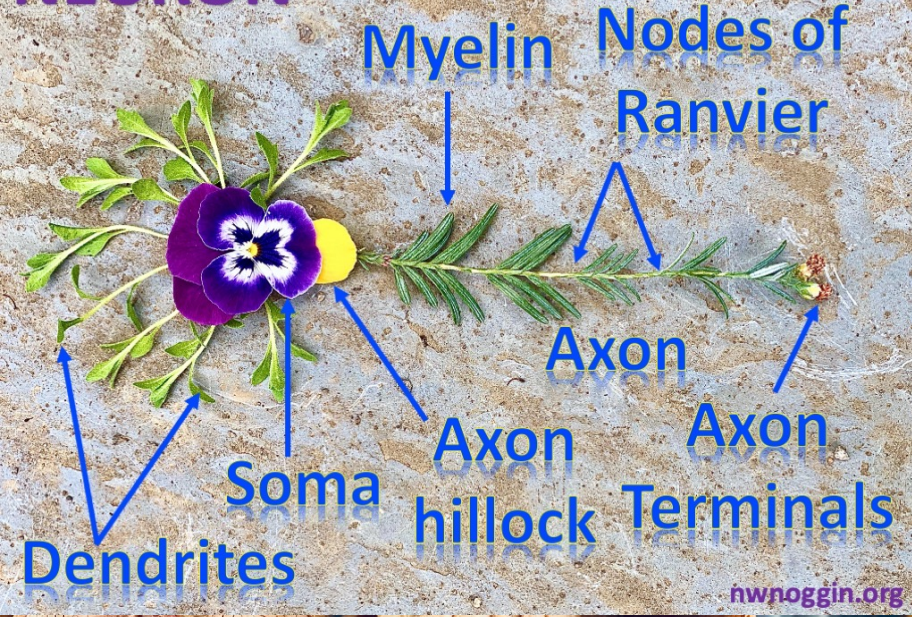


TEN YEARS!
ALL VOLUNTEER (everyone)
50,000+ community members

Art & Brains!



NEURON



Sleep
Anxiety
Depression
ADHD
Autism
Development
Perception
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 (PSU, 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 (MaLaren/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, Floyds/Street 14, Hospitals)**
 - *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...



To see other people

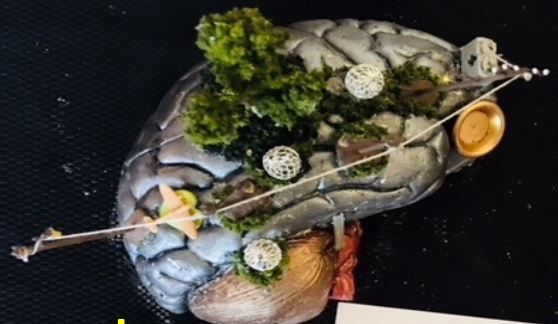


HOMELESSNESS & THE BRAIN

Thurs, Oct 19th
10am - 1pm



Researchers
Clinicians
Policy makers
Houseless youth



Bunny:
"we are all
connected"

Rural Outreach

TO GO PLACES!

Food, housing, baby goats...

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



Noggin + TRIO



Noggin + TRIO



NOGGINS ON THE OREGON COAST

The Stand, Seaside

nwnoggin.org



Community!



Rosebriar Mansion, Astoria



Clatsop Community College
TRIO Program



Fort George Brewery, Astoria



Brains!

Astoria Coop



Peter Pan Market, Astoria

**Astoria Middle School, Seaside Middle School
West Exchange Preschool, Astoria High School**



- Jasmin Mabry**
- Ellie Phelps**
- Michael Deveney**
- Greyson Moore**
- Lidia Echeverria-Garcia**
- Jeff Leake**
- Bill Griesar**
- William Leverette**

Noggin on the Coast
October 4 - 7, 2021

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



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-...

#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-...



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-...



Neuroscience & Law

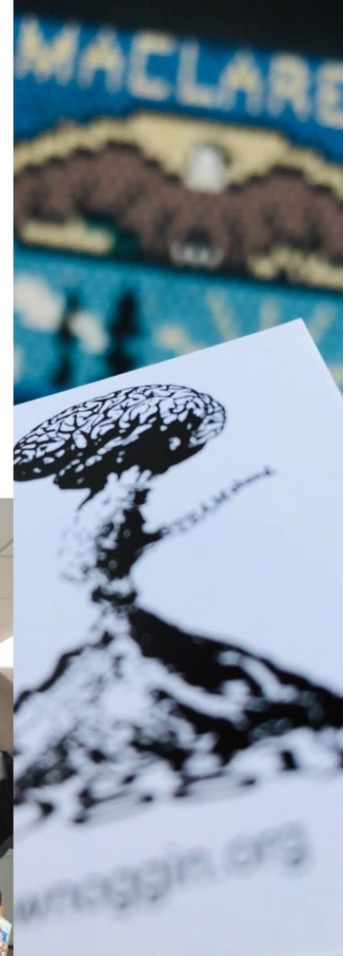
To listen, learn, empower & make change



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...

School visits



Turner Elementary, DC



Public outreach and connection

And also, in the U.S., to Capitol Hill

**More connections: Congressional office visits
Congressional Neuroscience/STEAM briefing**

**“Bipartisan”
neuron**



Research should inform policy

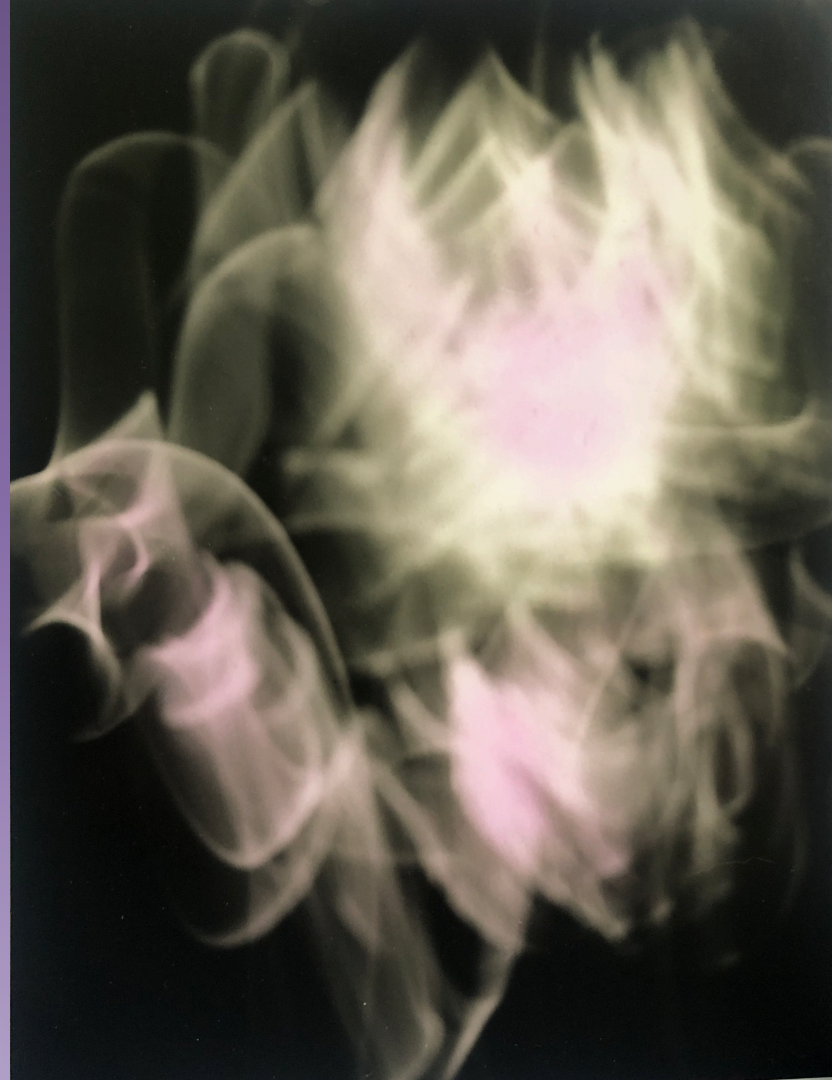
Britta Harbury, PSU undergraduate



Sunnyside Environmental School, PPS

A few years ago, when I was more ill, I read somewhere that when an initial diagnosis of mental illness is made, what should happen is that the doctor should give the diagnosis and give some basic information about the illness and the treatment. Then the doctor should walk out of the room, and a person with that diagnosis should walk in and say, “I have this illness, and I have a life. I have some really good things going for me on the other side of this diagnosis.”

-Corinna West



Sienna Morris
Artist/PSU transfer student



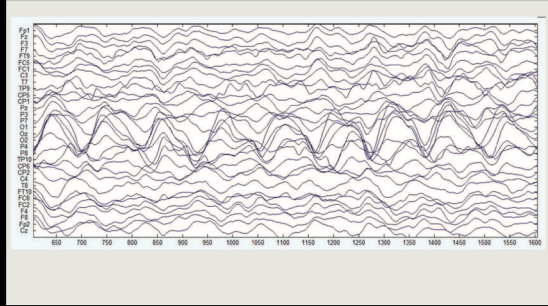
I had THE BEST time
volunteering with
[@nwnoggin](#) today

***St. Helens Residential
Drug Treatment Program***



Art & Neuroscience for Mental Health

My Brain



My Art



Interdisciplinary presentation about how self care can change a depressed brain.



Making connections 4 years later...



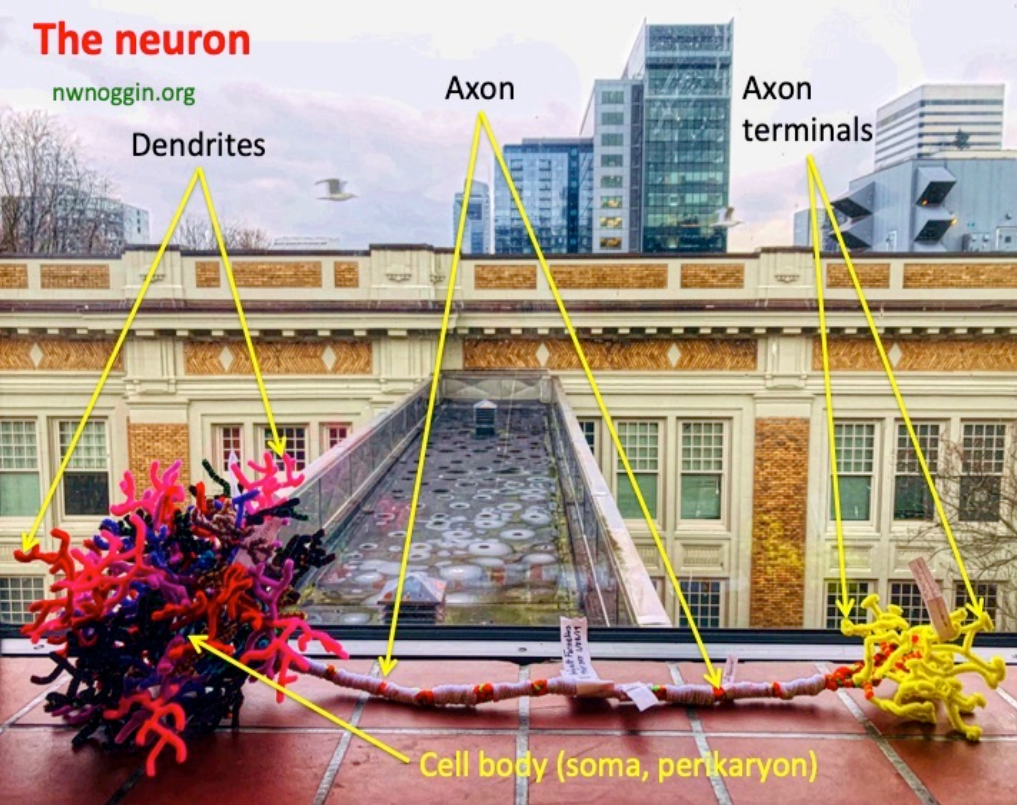
Talking about the brain in ways that can help people on their journey to recovery was deeply rewarding. I think we helped a little yesterday and I'm so grateful to have been a part of that.

...This experience was my first time working among my peers as a student. I restarted school during the pandemic so I haven't had the chance to connect with other students with similar interests. I can see what I'm missing and it makes me all that more excited to start at PSU next year.



The neuron

nwnoggin.org



MAKE YOUR OWN: Details @ 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.



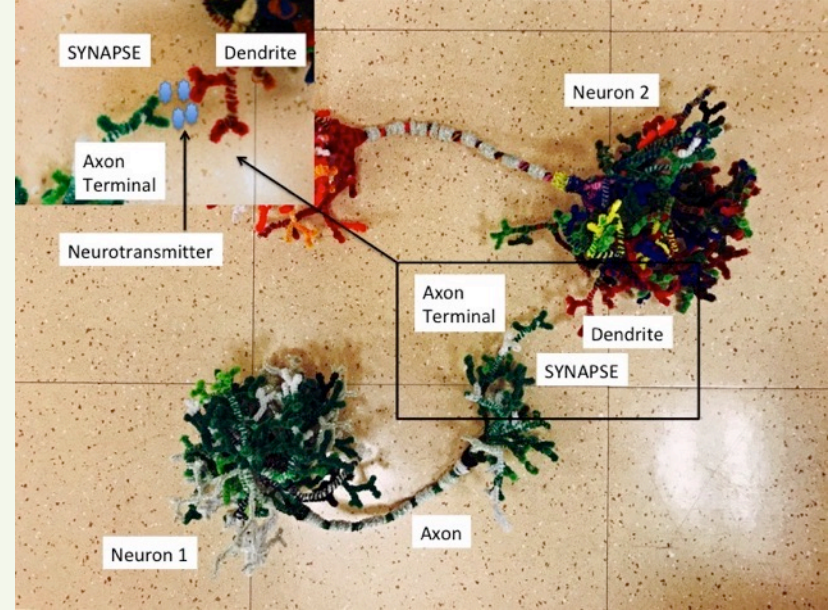
4. Attach axon terminals to the other end of your axon.



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





Public Schools During COVID-19

[#showusyourbraincell](#)

Neurons are a type of brain cell

The majority of neurons share some basic features

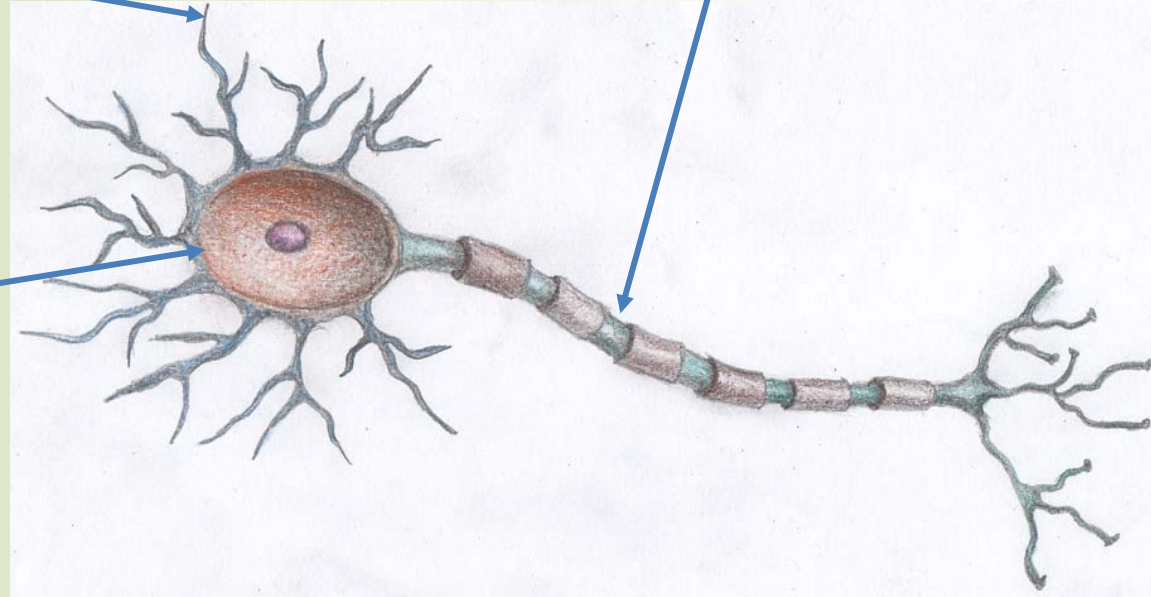
Dendrites

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

Cell Body

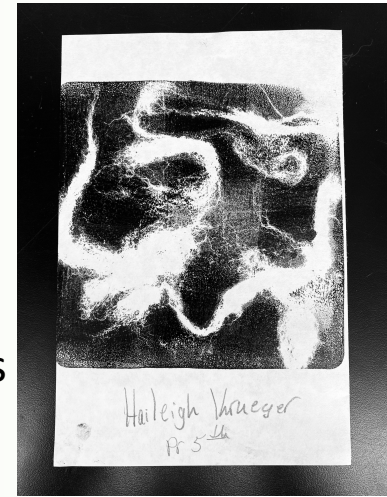
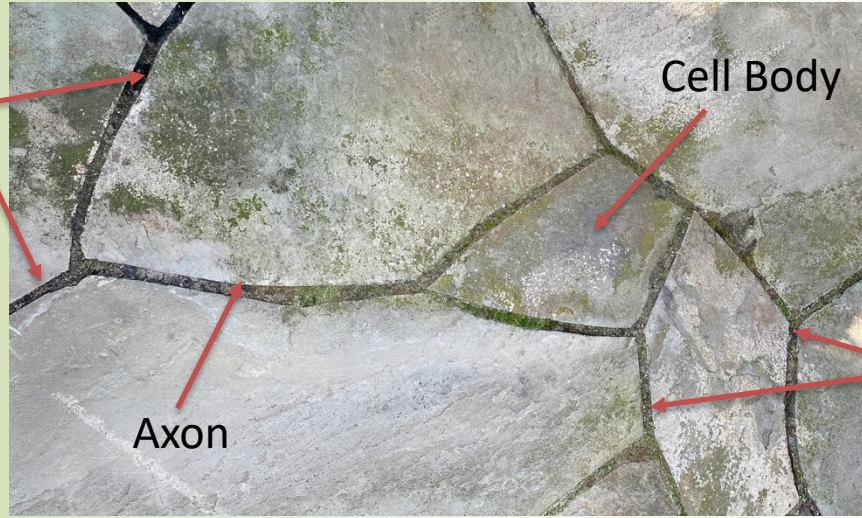
(or Soma, location of **nucleus** and cell **DNA**)

Axon (Carries electric message)



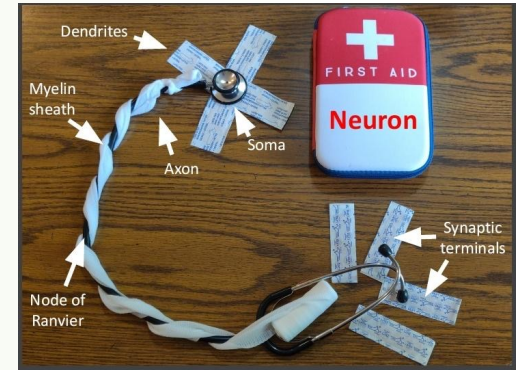
Found Object Brain Cells

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



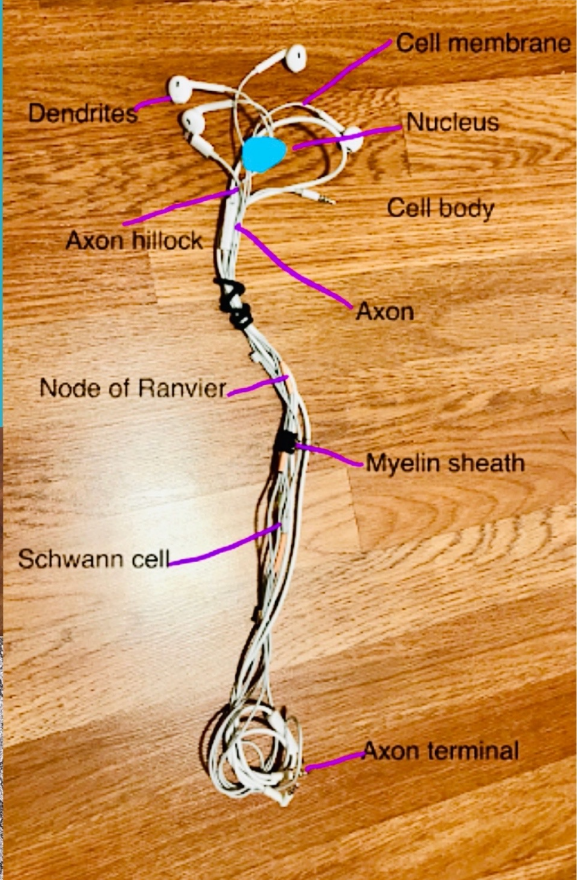
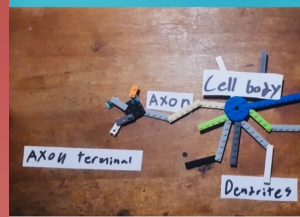
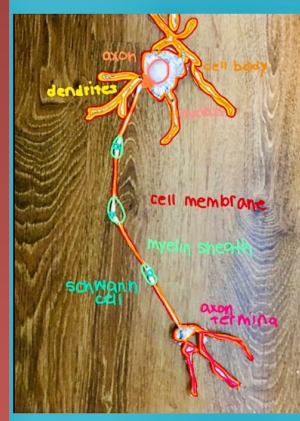
Can you construct a neuron out of things that you find?

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

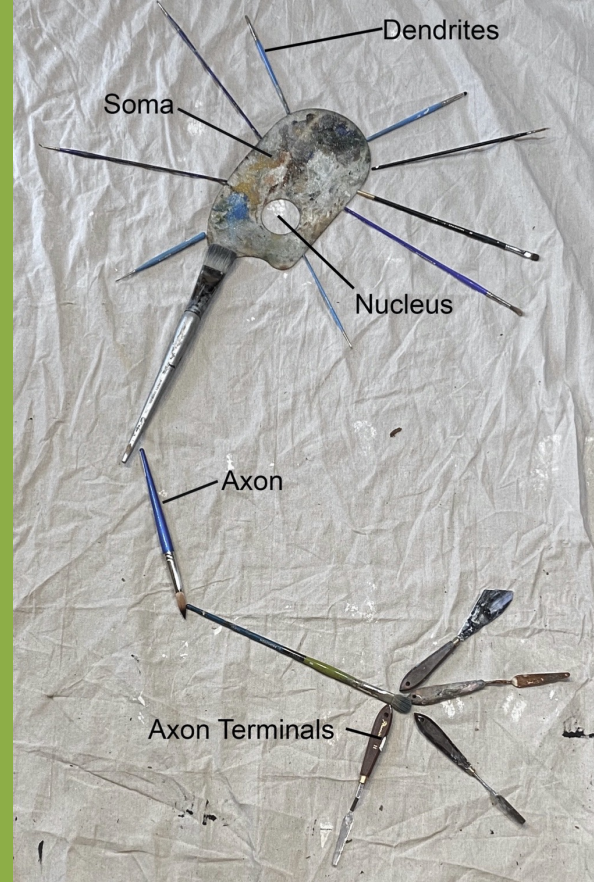
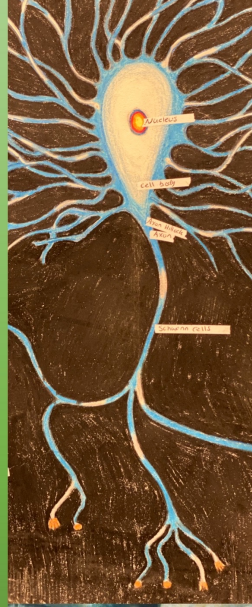


#showusyourbraincell

Neuron



#showusyourbraincell



#showusyourbraincell

Tuna Jig Neuron

#showusyourbraincell

Axon
(rolled up shrimp
netting)

Axon
terminals
(tuna jigs)

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

Cell Body
(lure for salmon
trolling)

Dendrites
(tuna jigs)

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

By Amanda Gladics,
Oregon Sea Grant, OSU



Serotonin Flow



By Sai Kiersarsky

#showusyourbraincell

#showusyourbraincell

ANY BRAIN CELLS
Glial cells
Pyramidal neurons
Photoreceptors
Inner hair cells
Nociceptors
Rhombic lip neurons
Meissner's corpuscles

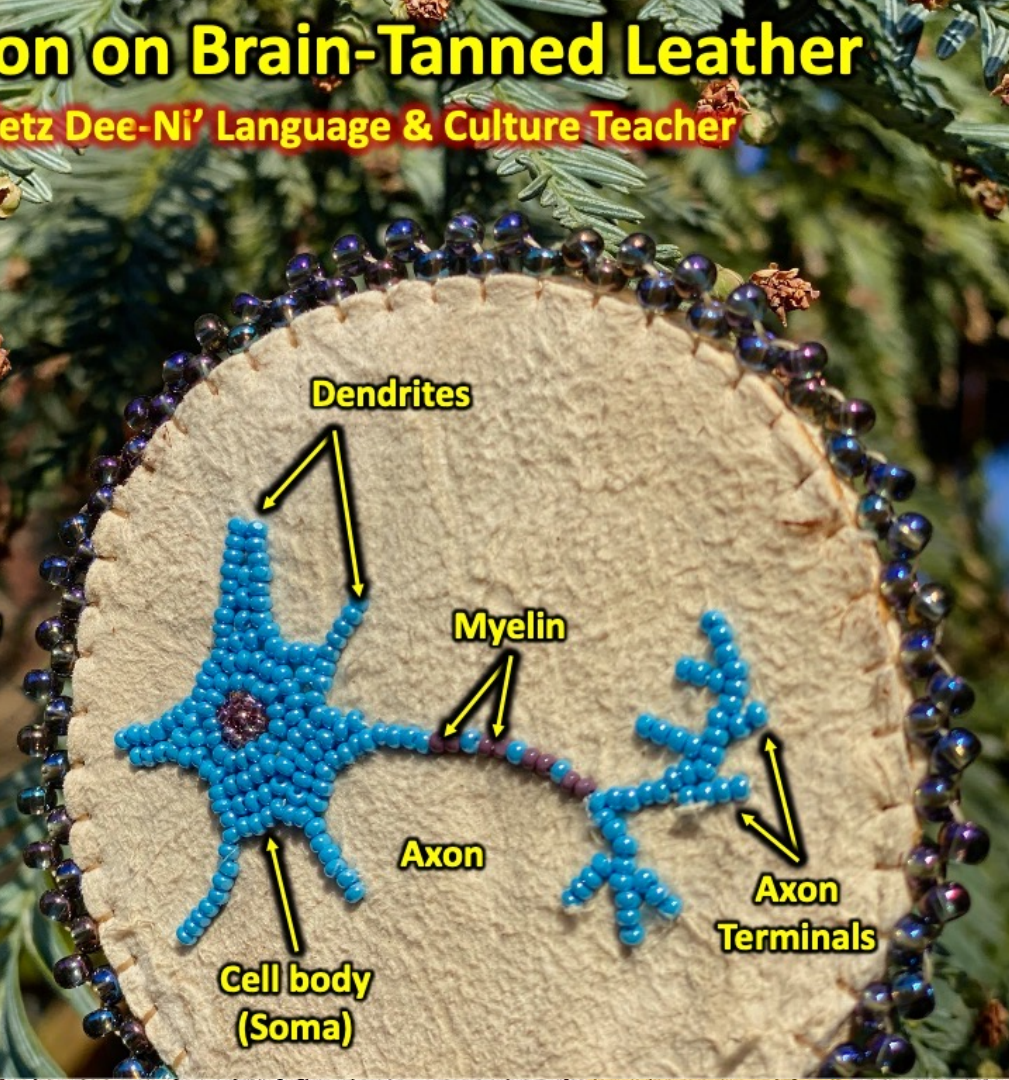


Beaded Neuron on Brain-Tanned Leather

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

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

#showusyourbraincell
nwnoggin.org





#showusyourbraincell

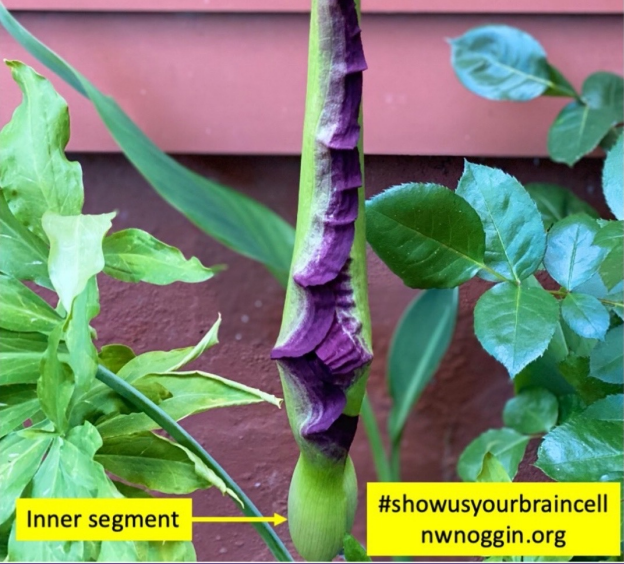
Dracunculus Vulgaris

Smells like rotting flesh
Pollinated by flies

Or...retinal cone cell?

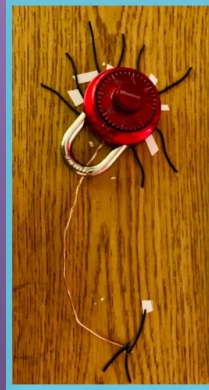
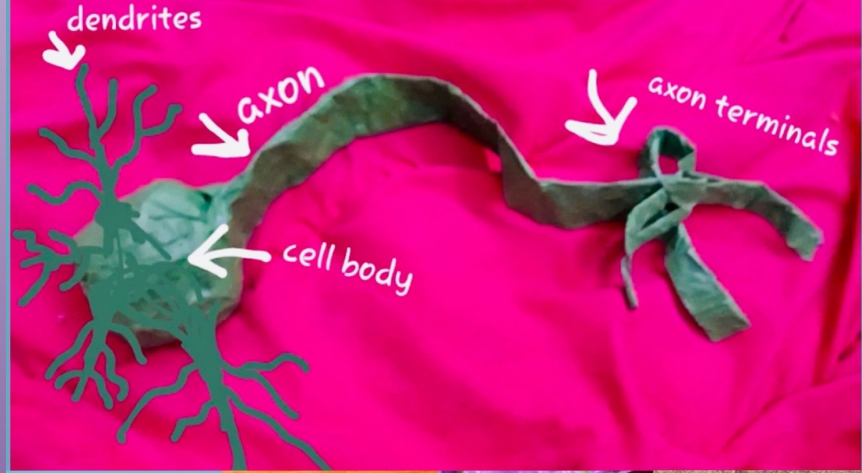
Membranous disks
(sites of photopigment)

Outer segment



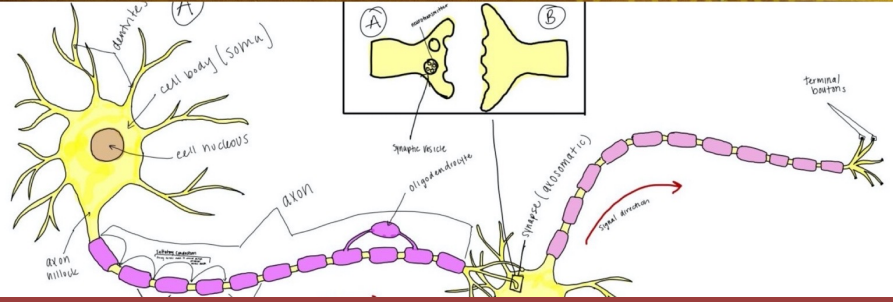
Inner segment

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nwnoggin.org

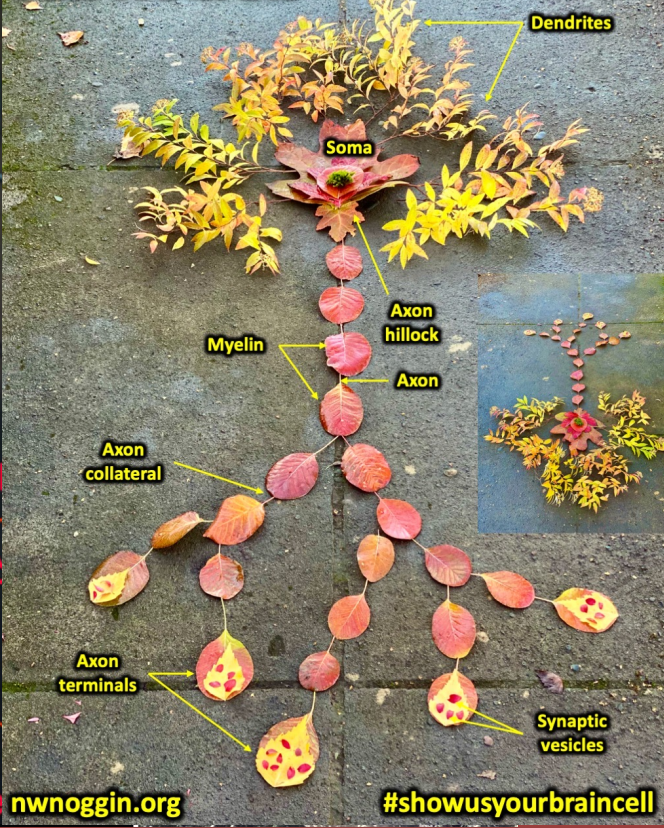
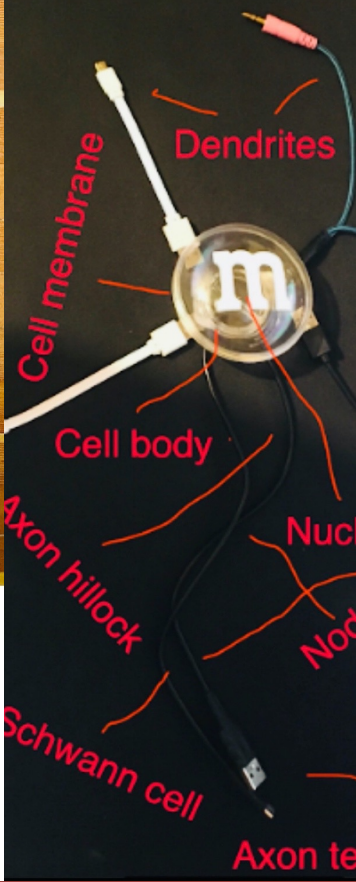


#showusyourbraincell

Neuron from the coat rack



Fall Neuron



wnnoggin.org

#showusyourbraincell

#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

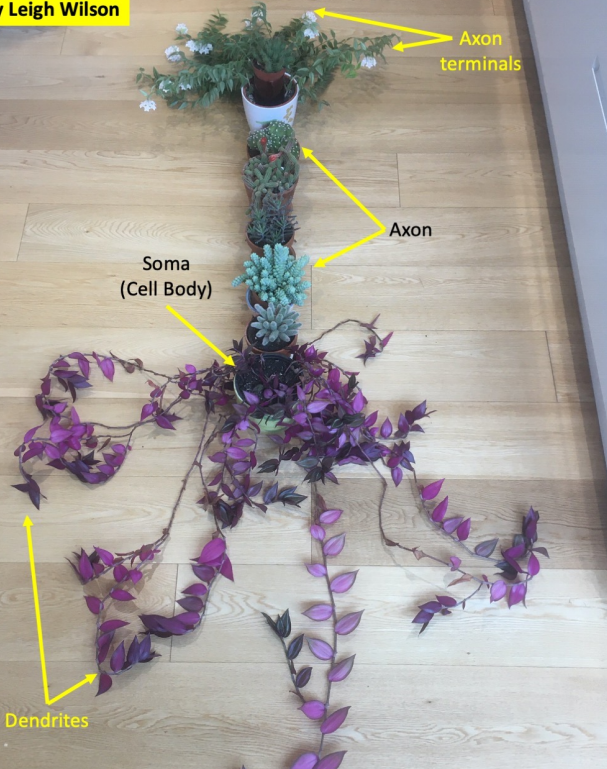


#showusyourbraincell



#showusyourbraincell

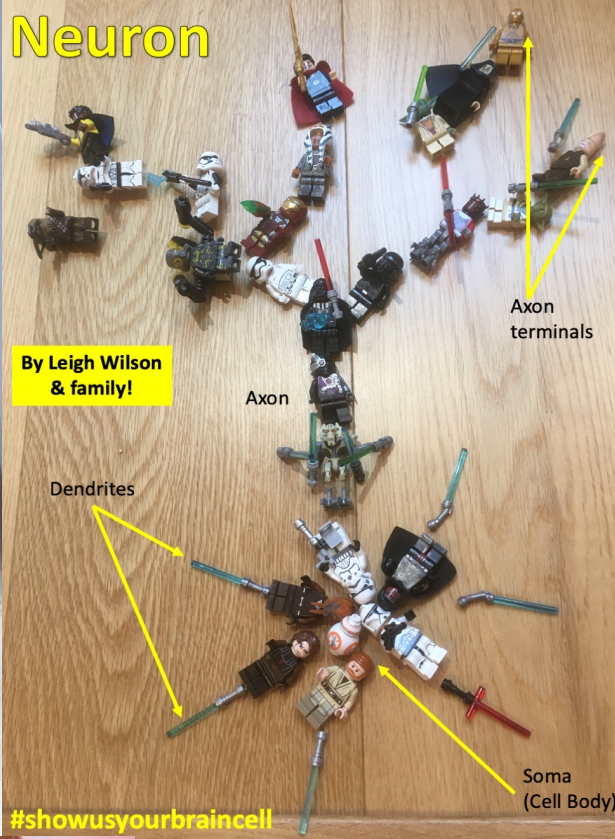
By Leigh Wilson



Neuron

#showusyourbraincell

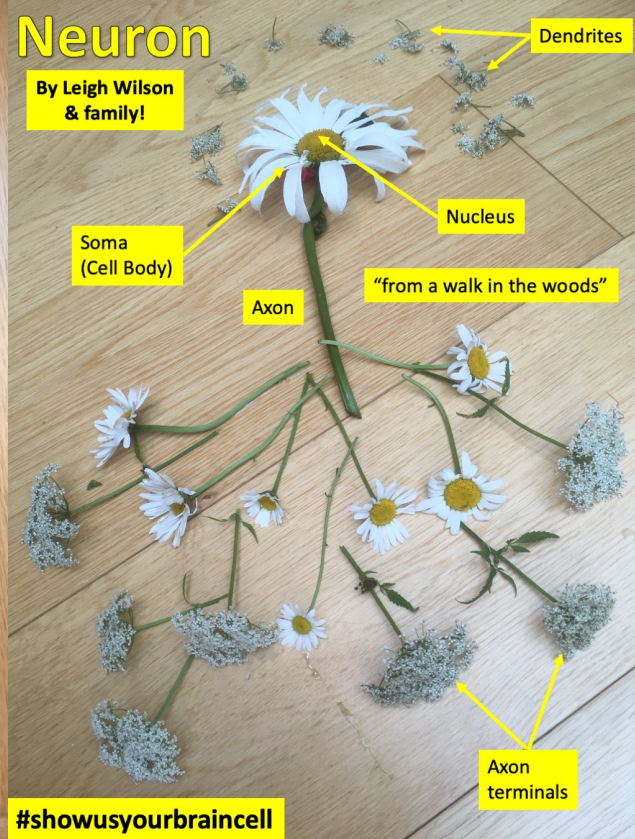
Neuron



By Leigh Wilson & family!

#showusyourbraincell

Neuron



By Leigh Wilson & family!

#showusyourbraincell



#showusyourbraincell

You can find neurons everywhere!

#showusyourbraincell

Dendrites!

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

Axon

Carries electric message (**action potential!**)

Axon terminal

Release of neurotransmitter

Axon hillock

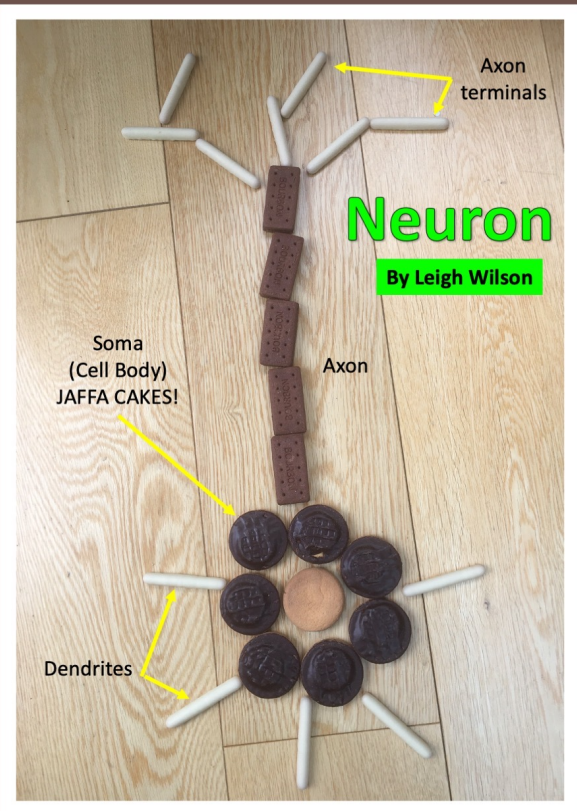
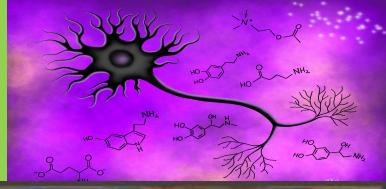
Initiation site for electric message

Cell body (or soma)

Important for cell upkeep; Location of **nucleus**, and **DNA**



Make your own – AND SHARE!



#showusyourbraincell

#showusyourbraincell

