BRAINS!

A CLOSE-UP LOOK AT WHAT

IS GOING ON INSIDE YOUR HEAD

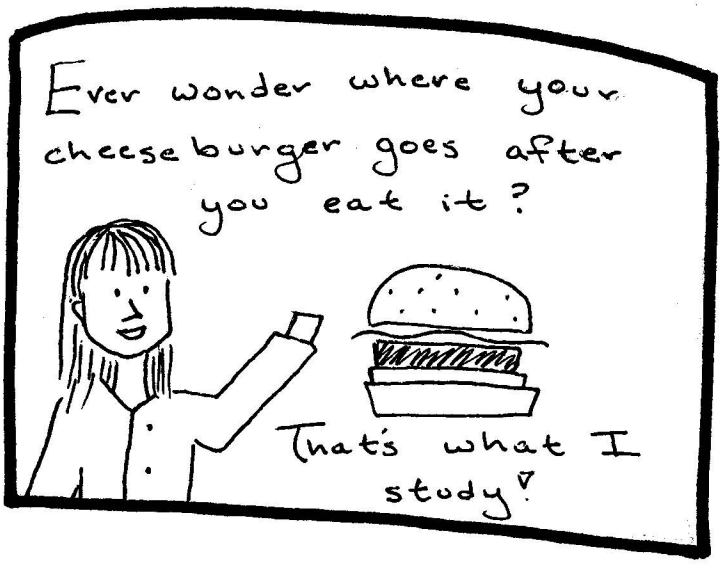
— By: Anya Kim —


Welcome to the brain!
Hello?
Wait, what is that?
Hey there!
Hello?
Look over here!
Where?
Over here!
Finally! I thought you'd never notice me!
Come on in!


Welcome to my home! It's pretty small, but that's what you get when you live in a brain.


That's my wife, Sofia! She's heading off to work.


Yeah, I'm a gastroenterologist! I study your digestive system, the thing that breaks down your food.
Like your stomach!


Ever wonder where your cheeseburger goes after you eat it?
That's what I study!


So, who are you?
Well my name is Ned, but everyone calls me...


MR SUPER BRAIN!
Nah, we call him Ned.

They call me Mr. SuperBrain because I'm a neuroscientist!

No, just Ned.

That means that I study your brain and the rest of your nervous system.

BRAIN

These are the parts of the body that help you think and feel emotions.

Hmmm...

And feel things like hot and cold . . .

Oh! Hot!

Oh! Cold!

And tell your muscles when to move.

Grrr!

I actually moved here so I could get a closer look at your brain!

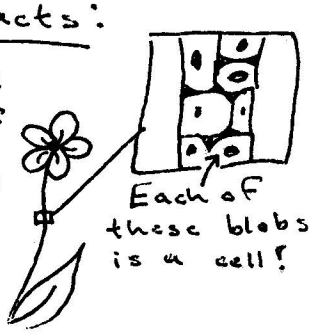
Oh I know, why don't I show you what I do every day!

It'll be fun, I promise!

Welcome to the BRAIN! In here you can see all of these tiny blobs, called cells.

Fun facts:

All living things are made up of cells, and cells are really important!



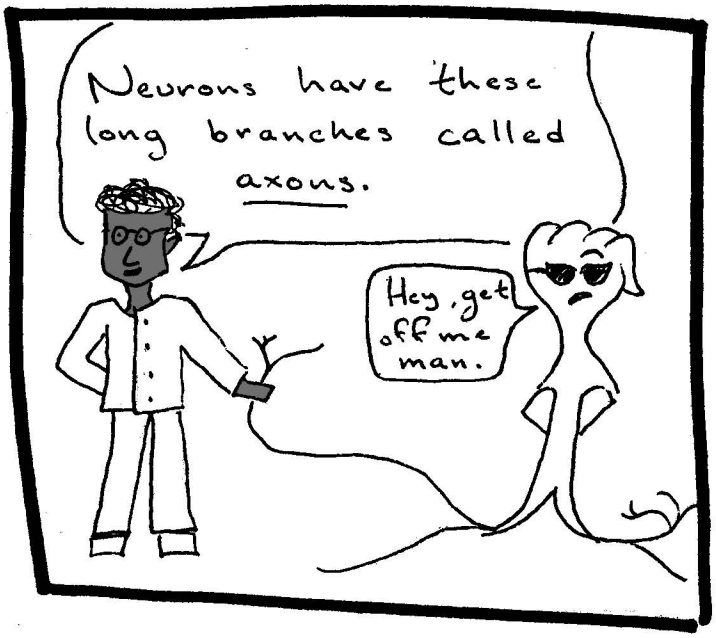
Each of these blobs is a cell!

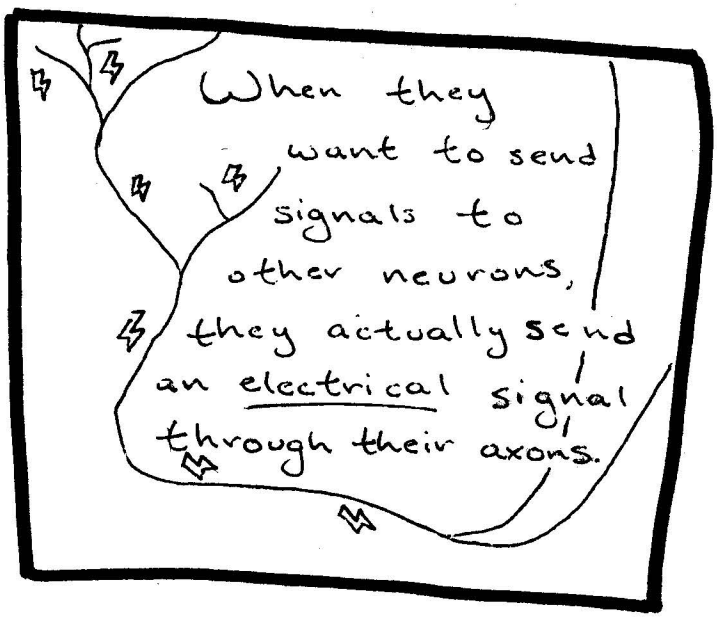
Most of your cells are so tiny that you can't see them on your own.

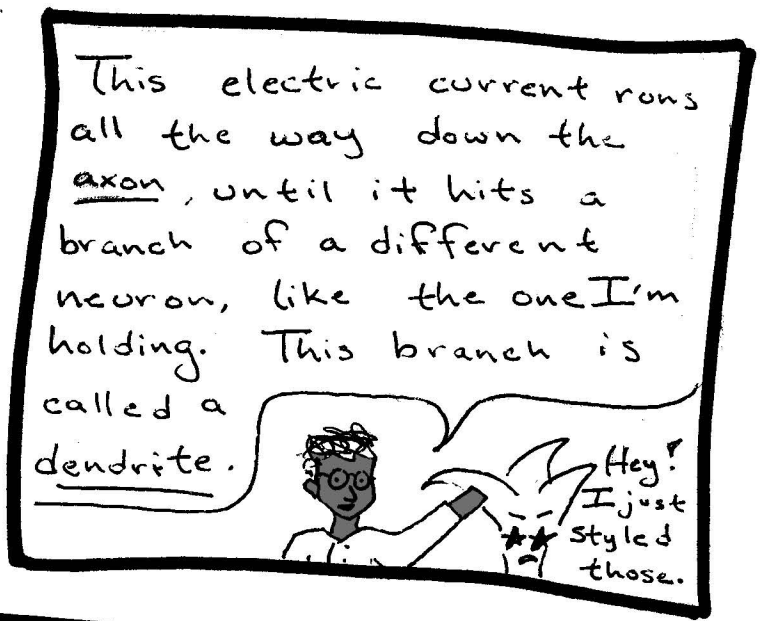
Oh wow, here are actually some cells right now! There are a ton of different types of cells, but these are called neurons.

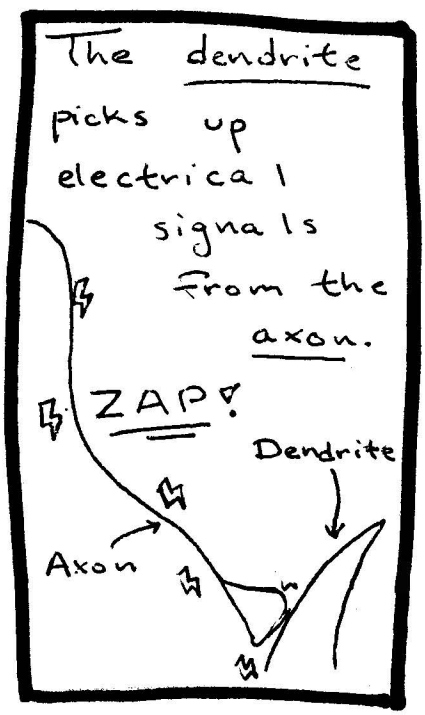
Did you know there are about 86,000,000,000 neurons in your brain right now?


These neurons are in charge of sending signals around your whole body.
Ugh, that creepy guy is back.


Neurons have these long branches called axons.
Hey, get off me man.


When they want to send signals to other neurons, they actually send an electrical signal through their axons.


This electric current rons all the way down the axon, until it hits a branch of a different neuron, like the one I'm holding. This branch is called a dendrite.
Hey! I just styled those.


The dendrite picks up electrical signals from the axon.
ZAP!
Dendrite
Axon

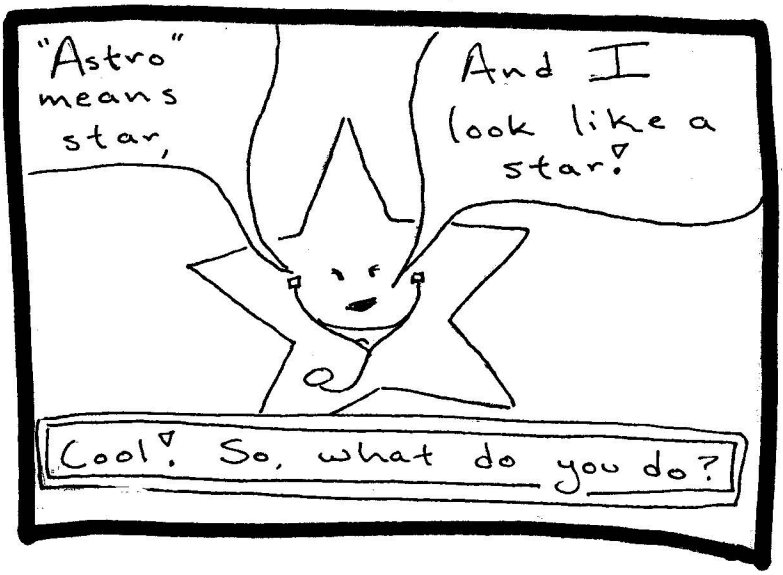

This signal gets passed on from axon to dendrite, and it lets neurons send signals all the way around your body.
Wow, that coffee is hot!
SSS
neuron
neuron
Ouch! Hot!
You

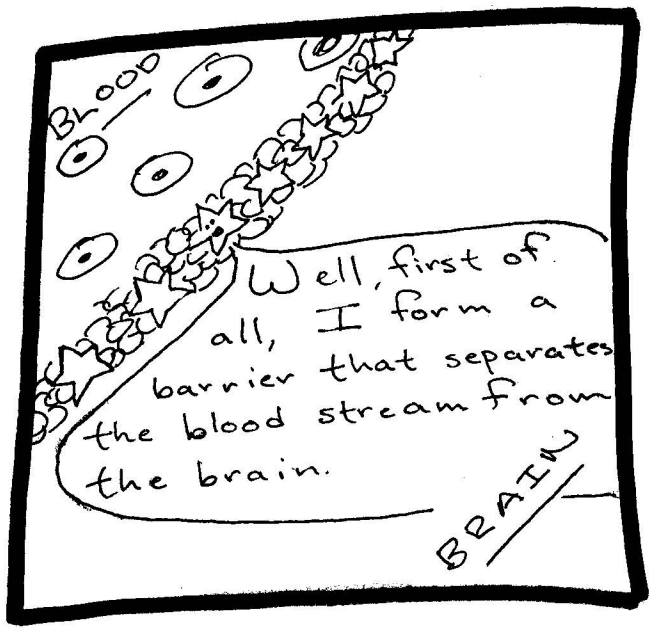

Oh man, these guys are just the best, aren't they?
HEY!

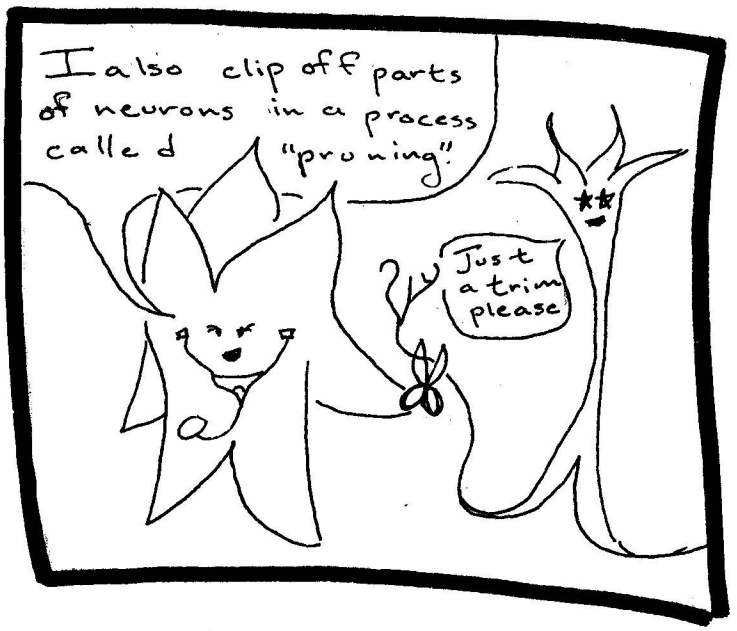

Oh, don't worry about these guys, they're not important.
WHAT?
We make up half of the brain!
You just always ignore us!
We're important to neuroscience!
Fine, these cells are called glial cells, and they are pretty important

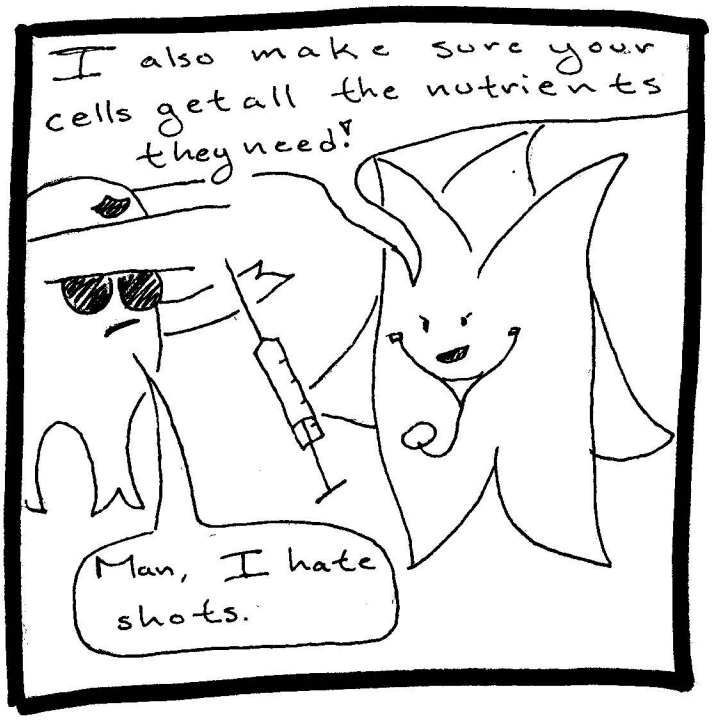

Alright, we'll start with you. This is a microglial cell, they're like the protectors of the brain.
You can call me Mike.
AUGH! A VIRUS!
This is how Mike protects the brain.
NOT
Oh no.
IN
The first thing he does is suck in all of his branches.
MY
Then he traps the virus, or anything else that can harm the brain.
HOUSE!
And that is a process called phago cytosis

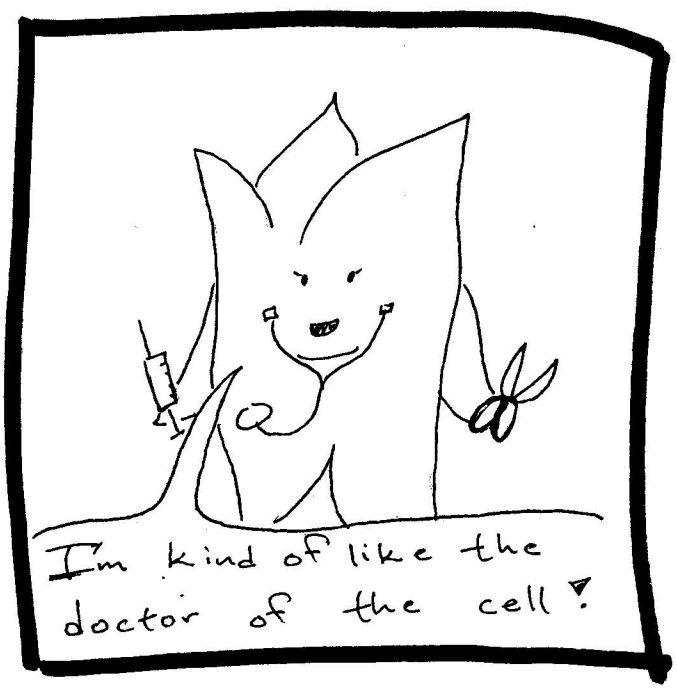

You're an astrocyte...? Astrid, right?
That's right!
Why do they call you an astrocyte?


"Astro" means star,
And I look like a star!
Cool! So, what do you do?


Blood
Well, first of all, I form a barrier that separates the blood stream from the brain.
BRAIN


I also clip off parts of neurons in a process called "pruning"
Just a trim please


I also make sure your cells get all the nutrients they need!
Man, I hate shots.


I'm kind of like the doctor of the cell!


Last but not least, here's an oligodendrocyte
So, Ned the neuroscientist, Mike the microglia, and Astrid the astrocyte...
You must be Ollie the oligodendrocyte, right?
No, my name is Steve.
How rude.
Oh gosh, sorry Steve. So... what do you do?
Well, I'm in charge of making neurons faster.
I coat the axons of neurons in this fatty substance called "myelin"
This "myelin sheath" makes the electric current jump like this
ZAP!
ZAP!
ZAP!
ZAP!
This jumping makes the electrical signal travel faster.
This myelin also protects the axons.

Don't worry, not all neuroscientists live on top of brains.

Actually, I'm the only one who does...

Some people work in labs, and find out new things about the cells in your brain.

EUREKA!

Others help people figure out what problems might be going on in their brains, and then they fix it to make them feel better.

I can't focus during class.

Hmmm... We can fix that.

Others can use the electric signals from neurons to make robotic limbs to help people walk again.

Ohh wow, cool!

But, if there's one thing I've learned in all my years as a neuroscientist...


Gosh, wasn't that...

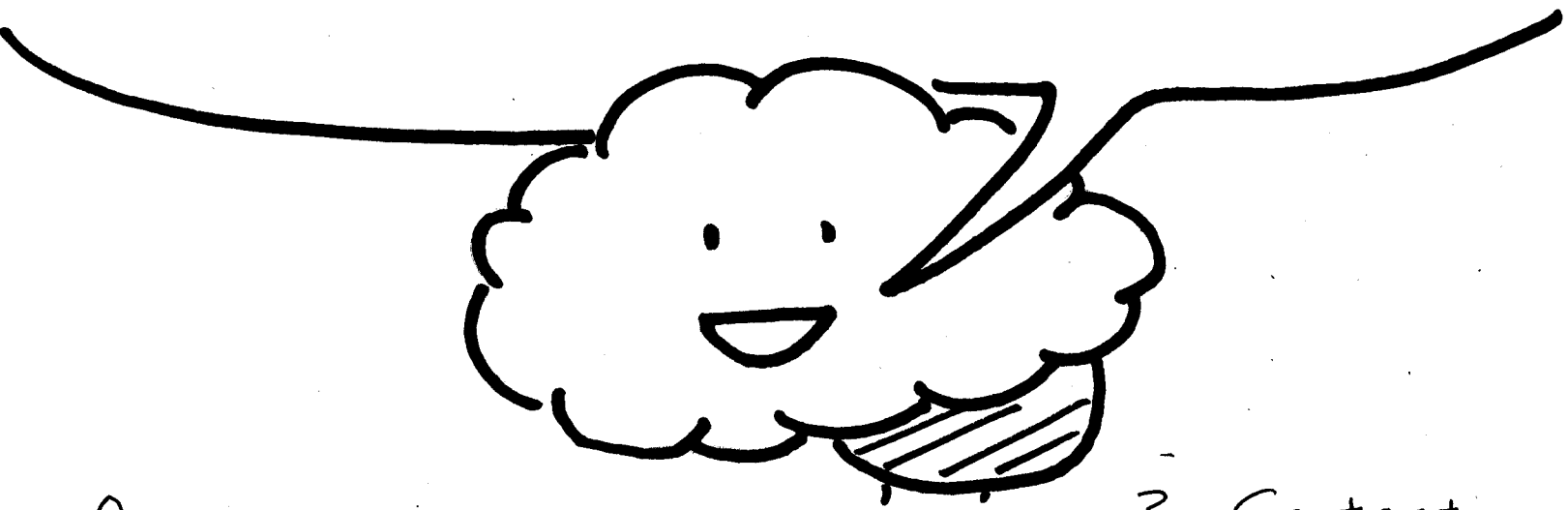

GREAT?!.


I just love being a neuroscientist!
Man, that guy needs to lay off the coffee.

It is that your brain is very flexible, and it's always changing. You can make it smart, brave, kind, anything! You can be whoever you want to be!

This comic was produced through the Latham Science Engagement Initiative!

THANK YOU FOR READING!



Any questions about the comic? Contact

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Next up on BRAINS!
Featuring
~~Ned the Neuroscientist~~
MR. SMART BRAIN!
No one calls me Ned...
Psst... We still all call him Ned...
THE GREAT
MUTATIONS
Why do they look so weird?
Why are there so many?
What happened?
Why are these cells different?
You will find out next time!