

The Lion Ledger

🍂 Fall 2022 🍂

Editor's Note:

Hello, reader! We are excited to present the inaugural issue of the Penn State COM Graduate School Quarterly newspaper! This will be a place where you, yes, you can share your thoughts, recipes, upcoming events, etc. with the rest of the Graduate School! Every issue henceforth will include segments from volunteers like yourself so that we can make our little corner in Hershey a more united and connected family. Have an idea for the Winter Issue? Want to be involved or have a seasonal segment of your own, but can't think of any ideas? We can help you out! Email lionstalkscience@gmail.com with your idea or interest and we can get you started for the winter issue!

-The LTS editors

Fall GSA and Harrisburg/ Hershey Events

Nov 6- Harrisburg Hot Cider Hustle Run, City Island

Nov 10- GSA Social Happy Hour at Rotunda Brew

Nov 30- GSA Social Ax-throwing

Nov 30-Dec 4- PA Christmas and Gift Show. Pennsylvania Farm Show Complex

Dec 6- Christmas in Hershey

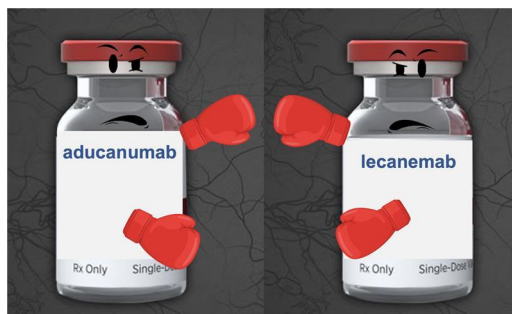
Dec 8- GSA Social Crafting and Movie Night

Dec 19- GSA Social Happy Hour at Iron Hill

Science in the News

Step Aside Aducanumab, Lecanemab is the New Alzheimer's Disease Talk of the Town

By Rebecca Fleeman



Over the past 3 years, Biogen has been in the spotlight over the [drama of aducanumab \(Aduhelm\)](#), the hot Alzheimer's disease biologic that was given FDA accelerated approval. The controversial approval was covered in [several news outlets](#), but the drug has mostly petered out, due to its high cost (\$56k per year) and lack of evidence for meaningful clinical benefit.

Now, just 15 months after aducanumab's splash of FDA approval despite incomplete data, a new Alzheimer's biologic which also target amyloid- β ($A\beta$) is taking center stage. [New clinical trial data for lecanemab](#), produced by Eisai and Biogen (the same two companies behind aducanumab), topped biotech

headlines on Wednesday, September 27th, as the data show that lecanemab met both its clinical and pathological endpoint targets.

What is the difference between aducanumab and lecanemab?

Both drugs are anti-amyloid biologics, meaning they are antibodies that target $A\beta$, one of the main pathological proteins found in the brain of Alzheimer's disease patients. The difference is that [lecanemab binds most strongly to amyloid- \$\beta\$ protofibrils](#), while aducanumab binds larger aggregates of $A\beta$.

Why might lecanemab be more successful than aducanumab?

A huge issue with aducanumab was that it elicited a common side effect called ARIA which involves brain swelling and bleeding. Lecanemab trials have a much lower incidence of ARIA. Most importantly, lecanemab minimized cognitive decline in Alzheimer's disease patients by 27% compared to placebo, decreased $A\beta$ levels in the brain, and improved multiple cognitive scores of patients after 18 months of treatment.

What comes next?

Eisai already submitted their previous data back in July of

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2022 to begin the FDA approval process, which could go into effect as soon as [January 2023](#). Based on the new data, Eisai will submit their new data to the FDA within fiscal year 2022 through the traditional FDA review process (not just accelerated approval), by March 2023. Notably, other Alzheimer's disease drugs are on the heels of lecanemab, including Eli Lilly's [donanemab](#), and Roche's [gantenerumab](#).

Trace Fingerprints in Blood Now Detectable

By Stephanie Baringer

Spooky season is upon us, and you know what that means? Listening to a ton of true crime podcasts while doing experiments. In that *spirit*, [a group of researchers from China](#) recently developed a tool to better visualize fingerprints in blood at the scene of a crime. You probably know that every time you touch something smooth, like a door or a handle, you leave behind a unique pattern. The ridges on your fingers trap substances that are then transferred to a surface, resulting in a fingerprint. Often times, a savvy criminal will wipe their fingerprints from surfaces, leaving investigators no evidence of the offender. However, fingerprints made in blood can

leave behind trace indentations that cannot be seen with the naked eye.

This is where the Fan group came in. The chemists developed a fluorescent polymer that forms a stable bond with albumin proteins in the blood serum. In their studies, the researchers made fingerprints in chicken blood on various surfaces. They soaked a cotton pad with the fluorescent polymer and placed it on top of the fingerprint. They then were able to develop and image the print. The results were spectacular and showed the detailed ridges of the fingerprints! The intricate patterns were distinguishable even if the fingerprint was contaminated with dust or mold. But what about the preservation of the DNA from the blood serum - DNA that could be invaluable in solving a crime? The Fan group tested if their polymer damaged the DNA from the serum and found that the DNA was completely intact!

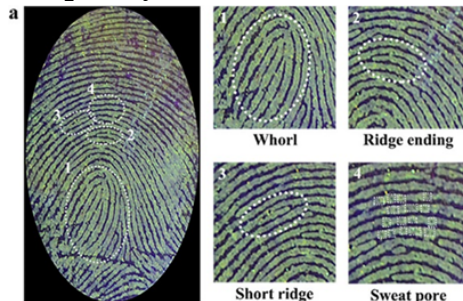


Figure of developed fingerprint taken from Fan *et al.* 2021.

So next time you contemplate murdering the person who left the cell culture hood a mess without a trace, maybe reconsider knowing that forensic science is always advancing.

Svante Pääbo, Father of Paleogenomics, Wins Nobel Prize

By Julia Simpson

Who are we? Where do we come from? What makes us... us? For many budding young professionals, these existential questions are familiar, but only considered in the abstract. For Svante Pääbo, seeking tangible answers to these questions consumed his scientific career. A research track that started as a secret side-project seeking to extract ancient mummy DNA – during his graduate work ostensibly focused on adenoviruses – blossomed into decades of relentless efforts to [reliably isolate DNA from early humans and Neanderthals](#). On October 3rd, 2022, this work [earned Pääbo the Nobel Prize](#) in Physiology or Medicine.

Years of dedication and pioneering the development of novel protocols led Pääbo to publish the groundbreaking first-ever full draft of a Neanderthal nuclear genome in 2010. That same year, Pääbo's

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group made another incredible discovery: that a sliver of bone found in a remote Russian cave belonged to a new hominin species altogether, which they named [Denisovans](#) (after the cave). Pääbo was fascinated by ancient hominins, asking questions like *which populations, if any, coexisted with early modern humans? And how much of our current genome can be traced back to Neanderthals and Denisovans?* These inquiries, in addition to refining our understanding of early human movements across continents, [also hold relevance to the medical field](#). For example, it is now known that the Denisovan-derived iteration of EPAS1, a hypoxia pathway gene that confers advantages to high-altitude survival, is prevalent in modern Tibetans. Further studies of ancient hominin DNA may further reveal how Neanderthals and Denisovans, already adapted to certain environments, may have passed along genes to early modern humans that helped us adapt and thrive in new climates.

Pääbo is still pursuing answers to the question of what genetically makes modern humans different from other early hominin species. Why did we outlive the others? Are the answers within our DNA? Four decades and a Nobel Prize later,

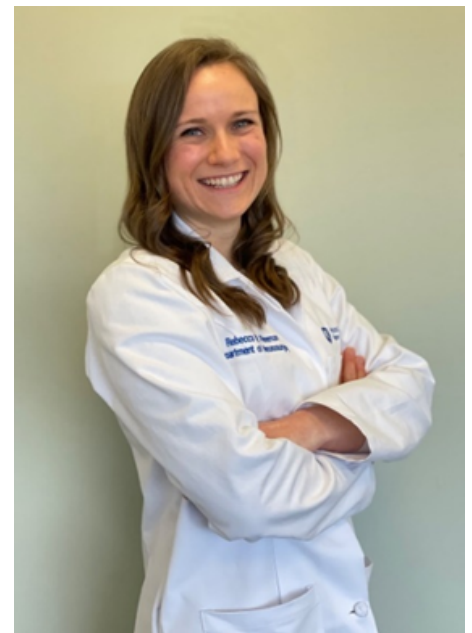
with the creation of the new scientific discipline of [Paleogenomics](#) to his name, Svante Pääbo hopes to find out.



Current Student Feature: Rebecca Fleeman By: Stephanie Baringer



Rebecca Fleeman, or affectionately known as Becca to her friends and colleagues, came to us from the land of ‘gaters and humidity so thick you could cut the air with a knife. Becca arrived at Penn State in 2018 where she found her passion studying Alzheimer’s disease in the lab of Dr. Elizabeth Proctor, who told me, *“Becca’s work is truly unique in the Alzheimer’s disease field. She is combining knowledge from her background in clinical research in diet and systemic metabolism with our lab’s expertise in systems biology and profiling of neuroimmune signaling to understand how metabolic changes that come with aging may create a disease-promoting environment in the brain. From Day 1 in the lab, Becca has been a driver of this work, expanding my original plan beyond what I*

could have dreamed of, to create an area of research in which she is uniquely expert. She teaches me new things every day, and I could not possibly be prouder of the star scientist she has become!”



Outside of lab, Becca is a dedicated student leader. She has served in various positions within GSA throughout her time at PSCOM. Aside from official positions, Becca is a positive force in the graduate student community. Mariam Melkumyan says, *“I’ve known Becca since my first year of grad school and every day she would come to class with a positive and go-getter attitude, even when things weren’t going as well as she would have liked. Becca is an*

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exemplar leader and I know she will succeed anywhere she goes because of her creativity and perseverance.” Similarly, Greg Kincheloe adds, “Ever since my first interaction with Becca, she has been so enthusiastic and always interested in what people do in science. Her enthusiasm is infectious and many programs would not be the same without her!” “Three things that stand out about Becca in every role she undertakes – from science communicator, to research, to friend – are her kindness, her enthusiasm, and her determination,” says Julia Simpson.

Becca’s greatest contribution to the student body may be her dedication to the Lions Talk Science (LTS) student-run blog, but I could be biased. When Becca joined the LTS editorial team in early 2019, there were three editors who published two articles a month, most of which were written by the editors themselves. Now, a little over three years later, LTS has grown to an editorial team of seven individuals, who are all passionate about science communication. The team publishes an article every week, all written by a diverse group of writers. Savanna Ledford says, “When I first came on the LTS team I was excited to learn how I can help and contribute to the

website...Her charisma, transparency, and support are just a few qualities I admire about Becca and I’m excited to see what her next role will be.” As editor-in-chief, Becca has cultivated an environment that drives both writers and editors to always improve upon their communication skills. “Filtering passion into concise and crisp chunks of information is a cornerstone of successful science. Becca has long-supported and improved a place one can not only hone these skills, but feel inspired to support others. Heavily responsible for building inspired word-smiths and passionate communicators, she has truly paid it forward,” says previous LTS editor, Dr. Stephen Matthews. In fact, Victoria Pearce (Silvis) explains, “Becca has made me a better writer and solidified my desire to pursue scientific communication.”

Becca continues to impress me with her scientific prowess and unending enthusiasm for personal growth. She is a valued colleague and friend that we at LTS are lucky to work with every day.

Want to be featured in the next issue of the Lion Ledger? Drop us a note at lionstalkscience@gmail.com and you could be the next featured student!



Get Paid for Being a Study Participant!

By Savanna Ledford

Need a break from your research and all the writing? Want to make a little extra money? Then sign up to be research participant for a variety of studies being conducted at Penn State University. Studies ranging from evaluating the impact of exercise and reproductive function to understanding the relationship between aircraft seat width and passenger comfort, are looking for study participants with the perk of being paid for your time! Compensation can range from \$25 to \$300 depending on what is involved as being a participant for the study. One study will pay participants \$50 to have your calf muscles activated to record the electrical activity and length of the muscle fibers. By measuring both the electrical activity and length of the muscle fibers, Dr. Rubenson will be able to understand how the connections between muscles influence how the muscles produce force. If you want to take a little road trip to Lebanon Valley College, approximately 30-minutes from

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the College of Medicine campus, you will be compensated \$50 to partake in a one-hour appointment where you will complete a variety of activities such as walking, jumping, and standing from a seated position. The purpose of completing these tasks is so that Dr. Onks can understand if using micro-doppler signal technology can be used to determine if someone has had an ACL reconstruction in the past. Now before you think you may not be eligible for the study due to not having an ACL injury, the study team is looking for participants who have had ACL reconstruction surgery 9-24 months prior and approved for normal activities *as well* as those who have no history of having lower extremity surgery. If you are interested in learning more about paid study participant opportunities within Penn State, click [here](#) or go to studyfinder.psu.edu/categories!

Now if you need a break from all things related to Penn State, there are still plenty of opportunities for you to make extra cash. The Center for Behavioral and Decision Research (CBDR) at Carnegie Mellon University is looking for participants to join their online research studies where participants can get paid between \$8-\$10 per hour. Partaking in

CBDR work does require you to create an account which can be found [here](#). Similarly, the Weinberg College of Arts and Sciences at Northwestern are recruiting participants for a variety of online [studies](#)! One study is asking for volunteers to perform various attention and memory tasks with the compensation being \$13 per hour. You can choose to complete a 30-, 60-, or 120-minute-long session.

As with any study you are interested in, please remember to read the inclusion and exclusion criteria. Some studies are looking for specific characteristics within their study population. Also, read more about what is expected as a study participant. If you have a limited amount of free time, signing up for a study that requires multiple visits may not be the best study for you. Don't be afraid to reach out to the principal investigator with any questions you may have, knowing what is expected and what all will be asked of you is important information all study participants need to know. Now go out and help other scientists complete their research and make a little money too!



Hidden Gems of Harrisburg

By Greg Kincheloe

Since many students and workers at the Penn State College of Medicine spend most of their time in Hershey or close by, it can be daunting to travel out to Harrisburg and explore some lesser-known spots. That is where we come in. Listed below are a few lesser-known-but-still-very-deserving-of-your-attention spots that everyone studying in Hershey should visit at least once.

1) The Tiger Eye Coffee Shop:



Love coffee? Frustrated at the lack of coffee shops in the Hershey area that are open past 3pm? Look no more! The Tiger

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Eye Coffee Shop is a cute lil' coffee shop offering all of your typical coffee drinks in addition to ice cream in case you're feeling indulgent. It has a variety of outdoor and indoor seating as well as a decent wi-fi connection. On top of that, it also functions as a local art gallery, with nearly every surface (including the ceiling) covered in works from local artists available for purchase. The best part? Tiger Eye is open until 8:00 or 9:00pm most days, meaning that you can continue your caffeine-fueled studying/working well past 3pm. *Driving time from Med Center: 15 minutes.*

2) Honey Bear Ice Cream: Can't eat gluten? Can't eat dairy? Are you allergic to peanuts? Are you vegan? Got a problem with soy? None of that matters to Honey Bear Ice Cream, a local business which serves vegan, gluten-free, soy-free, and peanut-free ice cream out of a pop-up trailer across the greater Harrisburg area. Their ice cream is a firm contender for my favorite, even factoring in that other dairy-based stuff. It is THAT good. Follow them on their website or social media to see

where they plan on being next, and don't be intimidated by the line. It's worth the wait. *Driving time from Med Center: Variable.*



<https://honey-bear-kitchen.squaresite/>
<https://www.instagram.com/eathoneybear/?hl=en>

3) The Jackson House: While not necessarily a hidden gem for



Harrisburg locals, this lunch spot in Midtown Harrisburg is nearly unknown to students in Hershey.

Their claim to fame? The best burger in Central Pennsylvania. And the fact that they are only open from 10:30am-2:00pm M-F should be a testament to how popular and delicious this place is. They seem to make their week's-worth of income from staying open for only 17.5 hours/week. It'll be difficult for students in Hershey to make it out there in that narrow time frame, but if you find the time, it's definitely worth the trip. A lot of their produce comes directly from the nearby Broad Street Market and their extensive list of Italian subs are also fantastic. Forewarning: it is cash only! *Driving time from Med Center: 20-30 minutes.*

Do you have a good spot that no one knows about in the area? Do you want to share? Please reach out to lionstalkscience@gmail.com and have your place featured and/or talk about it yourself!



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New Faculty Feature

By Victoria Pearce (Silvis)

Daniela Zarnescu, PhD



BIO: Dr. Zarnescu joined the Cellular and Molecular Physiology department at PSCOM in July 2022 after being an associate professor at the University of Arizona. She enjoys traveling, hiking, as well as art!

LAB: Dr. Zarnescu's lab centers on studying the molecular mechanisms of neurodegeneration and aging with a focus on RNA processing and cellular metabolism. Her lab currently has funding to support a student and she is open to having students from any program join!

FIND:



<https://sites.psu.edu/zarnescu/>

Nelli Mnatsakanyan, PhD

BIO: Dr. Mnatsakanyan joined the Cellular and Molecular Physiology department at PSCOM in January 2022 after being an assistant professor at the Yale University School of Medicine. She enjoys cooking traditional Armenian dishes and spending time with her children.

LAB: Dr. Mnatsakanyan's lab centers on studying the enigmatic cell death channel in mitochondrial ATP synthase and its role in Alzheimer's disease, aging, and cancer. The lab uses cryo-EM, cryo-ET, patch clamp techniques, and CRISPR/Cas9-edited mice to characterize structure, regulation, and function of this channel. Her lab currently has funding to support a student and a BMS or Neuroscience student would likely fit best!

FIND:  



Rameeza Allie, PhD, MS



BIO: Dr. Allie came to PSCOM from the University of Alabama at Birmingham in 2020. She loves teaching and interacting with people with diverse and fresh ideas!

LAB: Dr. Allie's lab focuses on the immune responses to respiratory pathogens that can inform vaccine design. Her lab currently has funding to support a student and BMS students would likely fit in best!

FIND: Around the BMR on floor 6!

Make sure to say hi to these new faculty if you see them in the hallway or contact them if you are interested in their research!

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Cozy Corner

By Victoria Pearce (Silvis)

Fall is here which means pumpkins and cinnamon are in everything! So, let's put them to good use with an easy, delicious, and versatile pumpkin bread recipe. This recipe yields 2 loaves, about 2 dozen muffins, 4 mini loaves, or any combination of these! Recipe credit: Lauren Allen from Tastes Better from Scratch



Ingredients:

- 2 c granulated sugar
- 1/2 c softened butter
- 3 large eggs
- 2 tsp vanilla extract
- 1 can pumpkin puree (15 oz, not pumpkin pie filling!)
- 2 3/4 c all-purpose flour
- 1/2 tsp baking powder
- 1 1/2 tsp baking soda
- 1 tsp salt
- 3/4 tsp ground cinnamon (I used 1 tsp)

- 1/4 tsp ground cloves
- 1/4 tsp ground nutmeg
- 1/2 c milk
- 12 oz bag of chocolate chips (I used milk chocolate but feel free to experiment!)

Instructions:

1. Cream together sugar and softened butter until well combined.
2. Add eggs, pumpkin, and vanilla, and mix to combine.
3. In a separate bowl mix together all dry ingredients.
4. Alternate adding dry ingredients and milk to the pumpkin mixture.
5. Fold in chocolate chips if using.
6. Pour batter into pans that have been sprayed and lined with parchment.
7. Bake at 350°F for 45-55 minutes or until a toothpick comes out clean.

*For mini loaves and muffins, bake for 25-35 minutes.



Seasonal Cocktail

By Greg Kincheloe

Nothing feels better than chilly fall weather and a nice warm cup of tea or coffee. But in case you want to feel a little more *toasty*, here is a classic alcoholic comfort drink that is sure to make you feel warm and cozy.

Hot Toddy

Ingredients:



- 1/4 to 1/2 cup boiling water
- 2 teaspoons honey (I like to just fill up a breakfast spoon with honey and stick it in the mug)
- 1/4 to 1/2 ounces lemon juice (recommend starting with 1/4 and going up to 1/2 if you want more lemon)
- 1 1/2 to 2 oz whiskey (alternatively can be a dark rum)

Instructions:

Pour whiskey, honey, and lemon juice into a mug. Fill mug to desired level with hot water or tea. Mix with spoon in mug to ensure honey dissolves. Enjoy!



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Dos and Don'ts of Looking for Jobs/Postdocs

An Interview with Jessica Kirkwood, Director of Graduate Career Services
by Mariam Melkumyan

It's never too early for graduate students or postdocs to start thinking about future careers and what steps need to be taken to best prepare for them. But sometimes the thoughts of the next steps can be very stressful, as you may not know what you want to do, how to go about looking for a job, or what to do when you get an interview. Below is my interview with Jessica Kirkwood, the director of graduate career services, who provides great advice on how to go about looking for jobs.

Q: What is the best thing students and postdocs can do during their PhD/postdoc to make applying for jobs/postdocs easy?

A: Get their documents (CV, resume, cover letter) reviewed through [Graduate Career Services](#), and [Schreyer Institute for Teaching Excellence](#) (for teaching philosophies). Network through attending conferences and using [LinkedIn](#). Keep their LinkedIn profile up to date.

Q: What do you wish students did to better prepare themselves for job/postdoc applications?

A: Take an inventory of your skills and strengths. You need to be able to highlight these skills easily in your resumes, CVs, cover letters, and interviews.

Q: What advice would you give to students applying for jobs?

A: Applying is only the first step. Prepare for interviews through mock interview platforms, such as Interview Stream, and through Graduate Career Services.

Q: What advice would you give to students who are looking for a very specific position vs to students who don't really know what they want to do?

A: For students looking for specific positions, try broadening your horizons a little by looking at related areas of research. For students who are not sure what to do, set-up a meeting with me and/or go online and do self-assessments to figure out what position fits best for you.

Q: How early should you start looking for a job?

A: If applying for postdoc, start the process 12 months before you graduate. For industry jobs, it varies, but should be around 3-8 months.

Q: What are some resources to help prepare for job search?

A: For industry jobs, use [biopharmguy.com](#) to find companies. Use the [National Postdoctoral Association](#) to find postdoc positions. Public health students can use the [Emory University](#) database. Attend the biennial [Graduate and Postdoctoral Career Day at PSCOM](#) and [career fairs at University Park](#). Look for federal internships and fellowships like [ORISE](#) and reach out to alumni who work at companies/labs you may be interested in working.



Q: What [services do you offer](#) that the students can benefit most from when looking for jobs/postdocs?

A: Resume and CV reviews, career assessments, and interview preparation. Individual appointments are open to both graduate students and postdoctoral trainees. Just schedule an appointment virtually or in-person or send an email with your questions.

CAREER SERVICES

For the full interview read “[Dos and Don'ts of Looking for Jobs and Postdocs](#)” at Lions Talk Science Blog.

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Puzzles, Comics, and Artwork

Editor's note: This is where you can share your artwork with the rest of the College of Medicine! Love puzzles or crosswords? Email lionstalkscience@gmail.com to become a one-time or regular contributor!



Drawing by Arrienne Butic

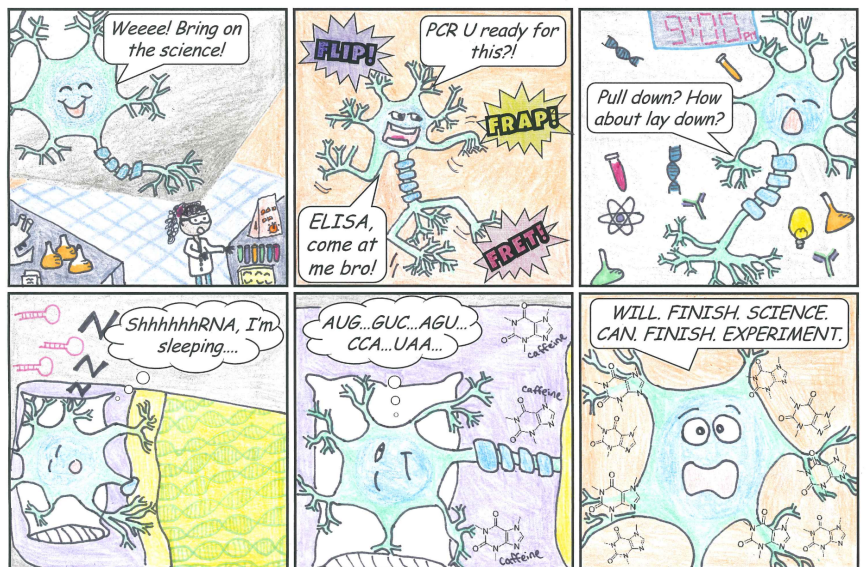
The potential of consciousness in a dish becomes more provocative with the development of rudimentary sensory organs.



Comic by Madison Kuhn

			5	3				8
	7	5				2	3	
9			6					
4		7	2					
			9	5		7		4
	6	2					9	1
	3		8			1	7	9
1				6	3	5		2
				9	2			

Sudoku by Savanna Ledford



Comic by Becca Fleeman