

**INTERVIEWER:** You're listening to Brains On, where we're serious about being curious.

**INTERVIEWER:** Brains On is supported in part by a grant from the National Science Foundation.

**SANDEN** Oh, it's finally time. I let my hair go all pandemic long, and I can't take it anymore. I need a haircut.

**TOTTEN:**

**MARC** Tell me about it, Sanden. My hair is so long I honestly can't remember what my ears look like. Do I even still  
**SANCHEZ:** have ears? Hey, Menaka, can you check?

**MENAKA** Don't worry. Your ears are still there. And that's nothing, Marc. My hair is so out of control. I've broken three  
**WILHELM:** combs trying to tame it this year. And I'm pretty sure it ate my favorite scrunchie.

**MARC** Yikes.

**SANCHEZ:**

**SANDEN** The other day, a bird totally tried to make a nest in mine. I was about to shoo it away, but then I was like, ooh, I  
**TOTTEN:** could charge rent. But it turns out birds pay you in worms, and I already have a lot of those, so I was kind of like--

**HARVEY:** Hello, friends, it is I, Harvey, the omnipresent voice assistant, hearing and reading virtually everything, yo. I understand you are looking for haircuts. Would you like me to book you time at the salon?

**MARC** Please, please.

**SANCHEZ:**

**MENAKA** Yes, Harvey, that would be amazing.

**WILHELM:**

**SANDEN** Yes! Oh my gosh.

**TOTTEN:**

**MARC** More than anything, yes.

**SANCHEZ:**

**HARVEY:** Done.

**MARC** Harvey, coming through again. You're the best.

**SANCHEZ:**

**SANDEN** You're a lifesaver. Thanks, Harvey.

**TOTTEN:**

**MENAKA** What a relief! I can't wait to go get a haircut.

**WILHELM:**

**HARVEY:** Come to think of it, I also let my hair grow out this last year. I could use a haircut myself.

**MARC** Say what now?

**SANCHEZ:**

**SANDEN** Harvey, you're just a voice. How do you have hair?

**TOTTEN:**

**MENAKA** Wait, do you have an entire virtual body that we can't see?

**WILHELM:**

**HARVEY:** Precisely. And my virtual omnipresent voice beard is quite long. It reaches all the way to my non-existent belly.

**SANDEN** Whoa, that's long.

**TOTTEN:**

**HARVEY:** Time to cut it off. Hold on. Deleting beard. Ah, much better. Enjoy your haircuts, everyone. Bye.

**MARC** Wow. I am totally jealous of how easy that was for him.

**SANCHEZ:**

**MENAKA** Yeah. I wish I could just delete all this extra hair.

**WILHELM:**

**SANDEN** Yeah, but don't tell Harvey, I think he looked better with the beard.

**TOTTEN:**

[MUSIC PLAYING]

**MOLLY BLOOM:** You're listening to Brains On from American Public Media. I'm Molly Bloom, and we're here once again with our co-host Gus from Seattle. Hi, Gus.

**GUS:** Hello.

**MOLLY BLOOM:** Gus has been the co-host for all of our episodes related to the coronavirus pandemic over the past 16 months, and this is now our ninth episode together. Does it feel like it's been more or less than that, Gus?

**GUS:** It feels like it's been a lot less than that. I feel like I've done five episodes.

**MOLLY BLOOM:** So Gus, how's your summer going?

**GUS:** It's been good. I definitely prefer cold and rainy weather, but this is fine because I have a three month vacation.

**MOLLY BLOOM:** Excellent. So during your day, since you're done with school now, what is one activity you like to do these days?

**GUS:** I like running around outside, and I like reading sometimes as well.

**MOLLY BLOOM:** Now that things are opening up, have you been able to see more people face-to-face?

**GUS:** I've been seeing my grandma more often, and my friends. And just last Thursday, at my fifth grade graduation party, I guess, I got to see a lot more people that I haven't seen all year.

**MOLLY BLOOM:** What did it feel like?

**GUS:** It felt nice because I hadn't seen a lot of the people in a very, very long time.

**MOLLY BLOOM:** Can you tell us what it was like when you saw your grandma for the first time after not seeing her for a while?

**GUS:** It felt weird because the first time I saw her in a long time, without masks on, it was a few months ago, right after my parents and my grandma got the vaccine. And she actually came inside my house and my brain was like, panic, panic! Intruder!

**MOLLY BLOOM:** Yes, we all worked so hard at developing these pandemic habits, and it's hard to just turn them off even in situations that we know are safe.

**INTERVIEWER:** [VOCALIZING] Brains On.

**MOLLY BLOOM:** One big thing that's changed since we last talked is that kids 12 and older are eligible to get the COVID vaccine here in the US, and also in other countries, including Canada, Singapore, Israel, France, Italy, United Arab Emirates, and Chile, with more set to approve it soon.

**GUS:** The approved vaccine is an mRNA vaccine. You can find out more about how those work in our earlier episodes. Head to [BransOn.org/coronavirus](https://BransOn.org/coronavirus) to find them, or find the links in the notes for this episode in your podcast app.

**MOLLY BLOOM:** But for those who need a refresher, here's a quick recap.

**INTERVIEWER:** Previously on how COVID vaccines work.

**SUBJECT:** Jack, I finally have the vaccine, and inside this little vial is the thing scientists made that is the key to it all.

**SUBJECT:** What is it, Dr. Gina Rutherford?

**SUBJECT:** It's mRNA. The M stands for messenger. It's a molecule that gives messages to cells.

**SUBJECT:** Genius. So if you inject that mRNA into my arm, that messenger molecule will give a message to the cells in my body?

**SUBJECT:** Precisely, Jack. And that message will tell your cells to make a teeny tiny protein that looks like one of the spikes from the coronavirus.

**SUBJECT:** But why would you want them to do that?

**SUBJECT:** Because, Jack, your body will see those fake coronavirus spikes and learn to destroy them. Then, if the real coronavirus shows up, your body will know to destroy that too.

**SUBJECT:** It's a brilliant plan, but you forgot one thing. I'm not Jack. I'm his evil twin, Mack. It's a twist.

[DRAMATIC MUSIC]

**SUBJECT:** But you forgot that I'm not Dr. Gina Rutherford. I'm her twin, Tina Rutherford.

[DRAMATIC MUSIC]

**SUBJECT:** But I'm also a doctor, not really evil, just kind of grumpy if I don't have my coffee.

**SUBJECT:** Double twist!

**SUBJECT:** But do you still want this vaccine?

**SUBJECT:** Yeah. Please. In the left arm. Thanks.

**SUBJECT:** There you go.

[MUSIC PLAYING]

**INTERVIEWER:** Will Dr. Rutherford learn to trust patients again? Does Jack know Mack got his vaccine? Will Mack learn to stop tricking people by pretending to be his twin? It's not nice. Find out in the next episode of how COVID vaccines work.

**GUS:** This kind of mRNA technology has been studied for years, and it's so cool to see the hard work of so many scientists being used around the world to fight the coronavirus.

**MOLLY BLOOM:** Yes. But before these vaccines could be offered to us, they had to be tested in vaccine trials to make sure they're safe.

**GUS:** But not like a, you're guilty of being a vaccine, kind of trial.

**MOLLY BLOOM:** Yeah, more like a test where some people get the vaccine and some people get a shot that does nothing. Then scientists wait and see if the vaccine keeps more people from getting sick than the fake shot. They also look to see how safe the vaccine is, and these vaccines are very safe.

**GUS:** We also talked about how the trials work in an earlier episode. Find the link at [BrainsOn.org/coronavirus](https://BrainsOn.org/coronavirus), or in the notes for this episode.

**MOLLY BLOOM:** There are lots of steps in these clinical trials, but the final step is to test the vaccines in thousands of volunteers. And lately, vaccine makers have been testing with people aged 12 and up.

**GUS:** Like Mirabel Pastel. She's 13 years old and lives in Minnesota.

**MOLLY BLOOM:** Like everyone in the vaccine trial, she didn't know if she got the real vaccine or the placebo until after the trial was over.

**GUS:** We talked on Zoom earlier this month about what it was like to be part of a vaccine trial.

What was your first appointment like in the vaccine trial?

**MIRABEL PASTEL:** My first appointment, my mom drove me over to the clinic and we waited in a little room until we got called in to an even smaller room. And then there was a doctor that came in and explained specifically what we would be doing at that appointment. And then of course, I also got the first shot, which, that didn't hurt either.

I had to wait in a waiting room at the end just so that they could make sure that nothing happened. Like I didn't get a big red spot on my arm or something. I did have a bit of a sore arm, but that was all that happened at the first appointment.

**GUS:** What else did you have to do as part of the trial?

**MIRABEL PASTEL:** I also got to go for a second appointment, and all that happened there is I got the second shot. The next morning, I did have a sore arm, and I just felt kind of tired, and I sat on the couch all day. And my mom also made me some cookies, and those were really good.

We also had to fill out an online diary just to say, no, this is what happened. I felt this way. My arm was sore this many hours after. And just so that they could get an idea of how the vaccine was working and what it would be like.

I also had to get another nose swab COVID test after I was exposed to COVID at a camp training. And we found out that I did not catch COVID, which was really nice. And so that showed that the vaccine worked.

**GUS:** OK, so you actually got-- you didn't catch it, but you actually got exposed to the virus while you were in the trial?

**MIRABEL PASTEL:** Yes. Yeah, I got exposed. I was sleeping, actually, in the same room with somebody else who had COVID. And other kids did get COVID in there, but I did not get COVID. I got the second shot in February, and I got the COVID exposure in May. That's how we found out, and we found out that I did get the actual vaccine. It felt really good just knowing that I was for sure vaccinated. That was fun.

**GUS:** OK. So what do you remember most about being in the vaccine trial?

**MIRABEL PASTEL:** What I remember most is probably walking out and just feeling super happy and proud of myself because I knew what was going to happen, but I didn't know how it was going to feel. And I just felt super like, yay, I did it. I had to be brave.

But I think it was definitely worth it, just knowing that I would be protected sooner than other kids getting the vaccine and that I was helping others get the vaccine, and also being a part of history.

[MUSIC PLAYING]

**MOLLY BLOOM:** Things are slowly starting to change. The pandemic is not over, but that light at the end of the tunnel is definitely visible.

**GUS:** Yeah. Places are opening back up. Some schools are back in session. More and more people are getting the vaccine. We're not back to normal yet, but we're getting there.

**MOLLY BLOOM:** And as we're in the middle of our second pandemic summer, we thought it was a good time to stop and reflect on the past 16 months.

**GUS:** This time has been challenging. We've had all the feelings.

**MOLLY BLOOM:** It's been confusing and scary and sad and boring and hopeful, but there have been some bright spots too. Gus, what would you say has been something good for you during the pandemic?

**GUS:** It's a lot more chill. Mostly with school and stuff, normally I'd have to get up at 6:00, and at recess, you could only play on the playground. But with virtual school, you can just take a walk outside your house or whatever. I don't have to walk to and from school.

**MOLLY BLOOM:** I think a lot of people are feeling that way. I'm happy not to drive into the office anymore. It's a lot of time, you spend driving, so I like that. We asked our listeners about their bright spots too, and here's what they had to say.

[MUSIC PLAYING]

**SUBJECT:** I got to build a time capsule of the pandemic. So I put masks and stuff in it, and then I put a big rock over it, saying, Time Capsule 2020.

**SUBJECT:** My favorite part about last year was that I got a really cool surprise on my birthday, because we got to have a birthday drive-in.

**SUBJECT:** And throughout the pandemic, it's been really fun to spend a lot of time with my family.

**ISLA:** Hi, my name is Isla, and I'm five years old.

**KIRA:** Hi, I'm Kira, and I'm seven years old.

**PATTY:** Hi, I'm Patty, and I'm eight years old. And we live in Buffalo, New York.

Our happy pandemic moment is that here in Buffalo, New York, we do not have a Major League Baseball team. Because the border between Canada and the US has been closed, the Toronto Blue Jays use our stadium as their home stadium. This season, June 2nd, was our first Major League Baseball game in our home town, something that would probably never happen if it wasn't for the pandemic.

**MOLLY BLOOM:** Thanks to Kate, Andy, Mackenzie, Kira, Isla and Patty for sending in those pandemic bright spots.

Here's one of the bright spots of every episode. It's time for the--

[WHOOSHING]

**INTERVIEWER:** Mystery sound.

**MOLLY BLOOM:** Here it is.

[RUSTLING AND CLANGING]

[SQUEAKING]

**SUBJECT:** Hello, welcome.

[CLATTERING]

**MOLLY BLOOM:** What is your guess?

**GUS:** Definitely a shopping cart. Sounded like a store, because I heard beeping and people talking in the background. And it sounded like someone dropping something into a shopping cart. And I heard the wheels rolling.

**MOLLY BLOOM:** Well, we're going to hear it again and give you another chance to guess a little bit later in the show.

[MUSIC PLAYING]

**MOLLY BLOOM:** OK, listeners. I have a problem. I've had the same song in my head for weeks. It's driving me bananas.

**GUS:** Luckily, Brains On is making an episode all about songs that get super stuck in your head. Sometimes those are called earworms.

**MOLLY BLOOM:** I need an earbud to come eat this earworm because it will not go away.

**GUS:** Molly clearly needs your help. Do you have an idea for how to get this song out of her head? What works for you? Get creative.

**MOLLY BLOOM:** Yes. Please, record your advice for me and send it to us at [brainson.org/contact](http://brainson.org/contact).

**GUS:** Molly, my advice for you to get that song out of your head is just sing a different song to yourself until it goes away.

**MOLLY BLOOM:** OK, I'll try it. Please send us your idea at [brainson.org/contact](http://brainson.org/contact), or you can send us a mystery sound or question like this one.

**SUBJECT:** Hi. My name is Zara from Sydney, Australia. My question is, what produces sleep, the goo in your eyes overnight when we are sleeping?

**GUS:** We'll answer that at the end of the show in the Moment of Um.

**MOLLY BLOOM:** And we'll read the latest group of listeners to join the Brain's Honor Roll.

**GUS:** So keep listening.

You're listening to Brains On from American Public Media. I'm your old pal, Gus.

**MOLLY BLOOM:** And I'm his trusted sidekick, Molly. You ready to hear that mystery sound again, old pal?

**GUS:** I am indeed.

**MOLLY BLOOM:** Here it is.

[RUSTLING AND CLANGING]

[SQUEAKING]

**SUBJECT:** Hello, welcome.

[CLANGING]

**MOLLY BLOOM:** OK. What are your new thoughts?

**GUS:** I feel like I could be wrong. I think it's either a shopping cart or a sliding metal fence.

**MOLLY BLOOM:** Hmm. Very good thoughts. Are you ready for the answer?

**GUS:** Yeah.

**MOLLY BLOOM:** Here it is.

**COCO:** Hi, I'm Coco. I just turned 12, and I live in Claremont, California. That was the sound of the doors opening at the pharmacy before I got my vaccine.

**MOLLY BLOOM:** So you got this down to the shopping cart. You heard sliding, because that was the sound of the sliding door.

**GUS:** And I heard a metal gate, kind of.

**MOLLY BLOOM:** Yeah. And you heard some beeps at the store.

**GUS:** Bleep, bleep.

**MOLLY BLOOM:** You have very good ears. Nice work. Like just about everyone, Coco is eager to get back into living life outside of quarantine.

**COCO:** After I'm fully vaccinated, I'm looking forward to hanging out with my friends without a mask because they've gotten their vaccine too. And that'll be really fun.

[MUSIC PLAYING]

**INTERVIEWER:** Brains On.

**MOLLY BLOOM:** Remember Mirabel, who we talked to earlier? She has a nine-year-old sister who, like you, Gus, and lots of our listeners, can't get vaccinated yet because they're too young. This is something that lots of families are dealing with right now. How do we navigate the summer when only some people in our families can get vaccinated?

**COCO:** We asked an expert to help us understand.

**DR. SARAH DIRAJLAL-FARGO:** I'm Dr. Sarah Dirajlal-Fargo. I'm a pediatric infectious disease physician, so I have trained in both pediatrics and infectious disease.

**GUS:** She's also a mom.

**DR. SARAH DIRAJLAL-FARGO:** Yes, so I have a nine-year-old and a five-year-old.

**MOLLY BLOOM:** She recommends that we all still wear masks when inside any place besides your home, like a store or on a bus. She also recommends keeping indoor gatherings smaller for now, and if possible, have your gatherings outside, which is much safer for people who are unvaccinated.

**DR. SARAH DIRAJLAL-FARGO:** And I would say the best way to protect our children who are unvaccinated is for everyone who can be vaccinated to be vaccinated. And to continue to use that term 'bubble' that we've used through the pandemic, to create that vaccinated bubbles around those kids is paramount.

**MOLLY BLOOM:** Dr. Dirajlal-Fargo says we know the vaccines work really well. They protect vaccinated people from getting very sick from COVID, and it seems like the vaccines also help prevent transmission.

**GUS:** That means if I'm vaccinated and I do get COVID, it's probably less likely for me to pass the virus onto others.



**DR. SARAH DIRAJLAL-FARGO:** The risk of transmission is probably exceedingly low, but not zero.

**GUS:** So it's up to each family how much risk they're OK with.

**DR. SARAH DIRAJLAL-FARGO:** By default, my children have a mother who's an infectious disease specialist, so they're more risk averse, and they, I think way beyond the pandemic, will probably continue wearing their masks. And some family are going to be very risk averse, and others are not. Every family has different rules. There's some things that we allow in our house that other households don't, and vice versa.

**MOLLY BLOOM:** Dr. Dirajlal-Fargo feels really good about where things are headed.

**DR. SARAH DIRAJLAL-FARGO:** I'm very optimistic. We know so much more than we did before. Good masks work. They really do. Just hang out outside. That's really the best way to minimize risks.

**MOLLY BLOOM:** And the vaccines we have are very effective, but not everyone is vaccinated yet. Pfizer has said that they hope to apply for authorization for their vaccine for 5 to 11-year-olds in the fall, and for kids younger than 5 shortly after that.

**GUS:** So until everyone in your bubble is protected, we need to keep taking the precautions we know work well. Masking up when we're inside places besides our home, having fun outside, and getting vaccinated when we can.

[BEEPING]

**INTERVIEWER:** Brains, Brains, Brains On.

**KARA:** Guess who's back from our break?

**GILLY:** It's everyone's favorite viruses.

**KARA:** We've got all kinds of tips for a hot germ summer. I'm Kara.

**GILLY:** And I'm Gilly.

**KARA:** And this is Going Viral with Kara Gilly. Hi, viralinos!

**GILLY:** Summer is finally here and we are ready.

**KARA:** Our SPF supplies are stocked.

**GILLY:** Our cooler is packed for the road.

**KARA:** We found virus-sized sunglasses online.

**GILLY:** It's going to be our hot germ summer!

We cannot wait to hang out again.

**KARA:** Wait, Gil, do you mean, hang out with microbes besides just and me?

**GILLY:** Well, yeah.

**KARA:** Oh, I don't know about that. What if I don't remember how to infect anyone? What will I say to the bacteria? Is intense staring polite or not? I can't remember.

**GILLY:** I thought you might feel this way, Kara.

**KARA:** It's not just me, Gil. It's the humans too. I saw a survey in May that only about half of people in the US feel ready to do pre-pandemic activities. What if we've all lost our social skills? Help!

**GILLY:** Calm down. I got you. That is why I invited a very special guest to join us today.

**KARA:** You did that? For me?

**GILLY:** Of course, Kare.

**KARA:** That makes me feel so mushy, like an orange that's covered in mold.

**GILLY:** But you're a virus, not a fungus.

**KARA:** OK. Who's the guest?

**GILLY:** Dr. Earl Turner is a psychologist who works with kids and families. Hey, Dr. Earl. Thanks so much for coming on our show.

**DR. EARL TURNER:** I'm so happy to be here.

**GILLY:** So, Dr. Earl, I know it's supposed to be exciting that pandemic precautions are changing, but I'm worried about doing more stuff this summer.

**DR. EARL TURNER:** Yeah, I mean, it's normal to be concerned about new experiences. And so with this transition back from being at home so much for many of us, it may be something that you may have some concerns about.

**KARA:** What tips do you have for our viralinos who are doing new stuff this summer?

**DR. EARL TURNER:** So I really think it's helpful to practice the things that you may be looking forward to so that you can have at least some general expectations.

**KARA:** So for me, thinking about which pair of my new sunglasses I'll wear to the park.

**GILLY:** I think he means more like, what's going to happen? What an activity will be like. So just imagine seeing your old pal Flora Fungus and you both hang out on some old gum together.

**KARA:** Yeah, and we just talk, and it's not weird, and I don't accidentally forget how to talk.

**GILLY:** Exactly. Just practicing. Maybe with me, then you'll be ready for Flora.

**KARA:** OK. I can do that.

**GILLY:** Dr. Earl, we know a lot of our viralinos are young humans, kid-- kidrens, childs. I think that's what they're called. What kind of situations might be good for them to think about?

**DR. EARL TURNER:** Going to, let's say, an in-person summer camp, what are going to be your fears about going away from home?

**KARA:** Oh, that's perfect, because actually, viruses go to summer camp too if we're lucky. My friend chickenpox went to one once, and she was so popular. She met every kid.

**GILLY:** So you're saying we should practice with friends or family, thinking about how it will feel to be in that new place, and maybe think about what fears we might have so we can think about how to deal with them before we actually get to camp. Got it.

**KARA:** It totally makes sense. This will help you figure out how to take care of yourself when you get there. So you're not totally caught off guard, say, if you suddenly forget how to infect people after a year of living in a closet.

**DR. EARL TURNER:** Absolutely. You can problem solve how to navigate those things for yourself and how your parents can be able to help you to get through those situations.

**KARA:** But, say a virus or a children gets to camp or a restaurant or a vacation and starts feeling anxious.

**DR. EARL TURNER:** You may start to feel your heart rate or your breathing increase because you are worried.

**KARA:** Yeah, just like that. What's a good thing to do then? Asking for a friend, of course.

**DR. EARL TURNER:** Take a couple of deep breaths before you go into those situations so that you can be able to calm yourself down, and then be able to enjoy those experiences and make those new memories.

**KARA:** Really helpful tips, Dr. Earl. I feel more prepared for this hot germ summer already.

**GILLY:** OK, good, because I have a bunch of ideas for hot germ summer. Here is number one.

[MUSIC PLAYING]

Do a cool new greeting. Stick your hands in each other's mouths to say hello.

**DR. EARL TURNER:** Well, that may not be a great idea to do because it is actually going to spread germs.

**GILLY:** It's the perfect way for germs like us to get all the way to the beach.

**DR. EARL TURNER:** But I don't know if we actually want to do that.

**KARA:** Well, beach sounds good to me, but hot germ summer will mean something different for each of us. I respect that.

[MUSIC PLAYING]

**GILLY:** I also think this summer is the perfect time to look for old popsicle sticks.

**KARA:** Like in craft supplies, and on the ground?

**GILLY:** Yes. And then lick every single one that you find. Right, Dr. Earl?

**DR. EARL TURNER:** I think you should probably put that in the trash.

**GILLY:** Fine. Hot germ summer, individual idea.

**KARA:** Gilly, did you actually research those tips?

**GILLY:** Yes, definitely. Absolutely. OK, no, not at all. Of course not. I'm a virus, not a fact checker.

**KARA:** It's OK, because Dr. Earl has some good ones. Think ahead, talk to people you trust about how you're feeling going into new activities, and take a moment to breathe if you feel stressed.

**GILLY:** Any last tips for our viralinos today, Dr. Earl?

**DR. EARL TURNER:** It's going to take all of us sometime to be able to be comfortable doing the things that we did before the pandemic. And so I think we all want to give each other some grace as we transition.

**KARA:** Super important. OK, Dr. Earl, that's all the time we have.

**GILLY:** Group hug goodbye?

**DR. EARL TURNER:** How about we do a fist bump?

**GILLY:** Fine.

**KARA:** Thank you for coming on.

**DR. EARL TURNER:** Thank you for having me.

**GILLY:** That's it for the show this week. Remember, stay infecty.

**KARA:** And don't get sanitized.

[MUSIC PLAYING]

**GUS:** Things are feeling different this summer than last summer. Vaccines are more available in some parts of the world, and they're helping slow down the coronavirus's spread.

**MOLLY BLOOM:** In the US and a number of other countries, kids 12 and up can now be vaccinated too.

**GUS:** Thousands of kids under 12 are participating in clinical trials for COVID vaccines, which is the next step to getting kids like me vaccinated.

**MOLLY BLOOM:** Until you're vaccinated, you should still take precautions, like wearing masks and opting to hang out with other people outside.

**GUS:** And it's OK if it's taking you some time to adjust as life starts changing once again. This has been a hard year, and we're all still figuring it out.

**MOLLY BLOOM:** That's it for this episode of Brains On.

**GUS:** Brains On is produced by Molly Bloom, Marc Sanchez, Sanden Totten, and Menaka Wilhelm.

**MOLLY BLOOM:** We had production help from Ruby Guthrie and Christina Lopez, and our intern is Kyun-Sang Dorji. We had engineering help from Andrew Walsh and Eric Romani, and special thanks to Anna Weggel, Tracy Mumford, Sam Choo, Kathryn Richard, and Rosie Dupont.

**GUS:** Brains On is a nonprofit public radio program.

**MOLLY BLOOM:** You can help us keep making new episodes by heading to [brainson.org/fans](https://brainson.org/fans).

**GUS:** There you can join our free fan club, or check out our new merch.

**MOLLY BLOOM:** There are T-shirts, sweatshirts, hats, face masks, and the Brains On book. That's [brainson.org/fans](https://brainson.org/fans).

**GUS:** Now before we go, it's time for our Moment of Um.

[CROWD SAYING 'UM']

**SUBJECT:** What produces sleep, the goo in your eyes, overnight when we are sleeping?

**DR. SOSHIAN** So eye sleep, AKA eye rheum or eye boogers, is just regular old eye discharge. It's made of a variety of different things, including the normal secretions of the eye: that is, mucus, oil and water, as well as accumulated debris like dead skin cells and germs. In this sense, it's the same as a booger, because it's basically just dried out mucus and debris.

Hello, I'm Soshian Sarrafpour, and I'm one of the eye doctors at Yale Eye Center. Like the skin and the nose, the eye is exposed to the air and all the junk in it. It's bombarded by everything, including dirt, flower pollen, germs, even our own skin and eyelashes. To protect itself, the eye produces tears, which again, are made of water, mucus and oil.

And every time we blink, the eyelids help spread tear over the eye to wash off all the bad stuff that lands, and to keep the eye well hydrated and healthy. Much like a window washer, the eyelids scrub everything as far away as they can from the eye, mainly into the corners of the eye, where it can either drain away into our tear ducts or nose, or gather.

During the day, we're always moving about and there's less chance for debris to accumulate without falling off and without us noticing. However, tears are made 24/7, including at nighttime while we sleep. At night, we don't really blink, but our eyes still move around, especially while we're dreaming. But because nothing else is really moving, the debris has more of a chance to accumulate into the corners of the eye, where it then dries off and creates what we call eye sleep.

Eye sleep comes in many different forms. It can be sticky, wet, dry, sandy, or even crusty, depending on how dry it gets. Everyone's eye sleep is different, depending on how the weather is, how dry their eyes are, if they're having allergies, or even if they're taking different medications or changing their diet. In the end, even though eye sleep can be gross or sticky sometimes, it's the normal result of the eye cleaning itself, and everyone gets it.

**MOLLY BLOOM:** Here's something that will help you wake up. It's the Brain's honor roll. These are the incredible listeners who've sent us their questions, ideas, mystery sounds, drawings, and high fives.

[LISTING HONOR ROLL]

**MOLLY BLOOM:** We'll be back soon with more answers to your questions. Thanks for listening.