Trichology with Dr. Valerie Horsley
Ologies Podcast
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Heeeyyy, it's me. It's your hairdresser's daughter with the cool-ass perm, Alie Ward. I'm here with another episode of Ologies. Are you ready to *hair* trichology? Yes you are, you wispy beast. Let's do it.

Okay first, quick thank you to all the patrons at Patreon.com for making this podcast possible. I just posted the almost two-and-a-half hour uncut, raw version of dendrology—no edits—for y'all as a bonus to say thank you for chipping in every week and helping me pay an editor. You can also support Ologies by wearing some sweet-ass merch. There's so much stuff available at OlogiesMerch.com. Thank you to everyone who's downloading. Thank you for telling your friends or your coworkers. Thanks for tweeting about it and instagramming about the show. The past couple months, the numbers have been getting crazy, you guys. It makes me so happy. I'm like, "Whaaaaaaaaat??" I want to cry but I'm not going to because we have chin hairs and drain clogs to discuss. So, thank you for subscribing to the podcast so you'll know as soon as episodes go up, and rating and reviewing.

As you know, I read all your reviews. I don't have any shame about it. Yeah, I read 'em! I read the hell out of 'em! This week I'm gonna read one that is a hot button topic and it needs to be addressed. Let's do it. Let's talk about it. Wayne W. says:

> *You need to understand how much I like this podcast. I'm one of those horrible people who feel very strongly about the pronunciation of gif [phonetic: "Giff"]. Like, I will come at you if you pronounce it like it's peanut butter.*

Oops!

> *So, when Alie said gif [ph. "Jiff"] during the dendrology episode, my family all looked at me to see how I would react. (OMG she's gonna lose it for sure.) But I like Alie and Ologies so, so much that I just shrugged. This is the highest praise of all time*.

So, Wayne W., thank you so much for that. I pronounced it gif [ph. "Jiff"] because the creator of gif [ph. "Jiff"] wants it pronounced gif [ph. "Jiff"]. If someone told me to pronounce my name Alie, [ph. "Aye-lee"] I'd be like, "Fuck off!" So, if you want to call it a gif [ph. "Jiff"], you can do that if you invented the gif [ph. "Jiff"]. I said it gif [ph. "Giff"] for a long time and I'm just trying to honor the person who made it.

Okay, Trichortreat! Trichology, the study of hair. Here we are, whether yours is thinning or not. *Thrix* means hair in Greek, which morphed into *trich*, which also means hair. So, I'm going to give you a super quick overview to give you some context for this episode. Hair is made of three parts. There's an inner part called the medulla, then around it there's a cortex which contains keratin, that's protein. It makes it strong. And it also contains different kinds of melanin pigments that give it color. Then there's an outer cuticle that looks like a series of overlapping scales, kind of like a

pangolin, and it repels water. You've got your vellus hair. That's your fine, barely visible peach fuzz. Unless you're standing in a bright light at a barbecue and then you're like, "Can everyone see my face hair?" And terminal hair. That's the big wiry guys. Boom! You know a lot about hair right now!

In this episode of trichology I sat down with a Yale researcher and professor who focuses on skin and hair regeneration. Then, in all of her spare time from being a Yale professor—just kidding, I don't know how the hell she does this—she is also running for the Connecticut State Senate in the 17th district. In *my* spare time, I look at pictures of dogs on the internet.

I met her through an internet pal and ologite, Aaron Herdman, who I got to meet in three-dimensions when he and this ologist came to California. Aaron sat in on this interview so you may hear him chuckling a little bit here and there, shifting in his seat. But this ologist sports a blonde bob, and a very down-to-earth southern ease. And I was just thrilled to have them over to talk about mammalian hair trends, and growing hair, and losing hair, and then re-growing hair, and lightening it, lasering it, loving it, hating it and all the things in between. Also, we cover hair museums and plumbing problems. You're never gonna look at your own furry body quite the same. So please get ready to run your fingers through this next episode all about hair with trichologist, Valerie Horsley.

Alie Ward: So yeah, just hold it like an ice cream cone. I'll check your levels.

Dr. Valerie Horsley: Valerie Horsley.

Alie: Doctor.

Valerie: Doctor.

Alie: Now, what is your title? What's your official title?

Valerie: Associate Professor in Molecular, Cellular and Developmental Biology and Dermatology.

Alie: I saw that on the Yale website and I was like, she has so many words in her title. [*laughs*] Can you explain a little bit about what you do?

Valerie: Yes, I'm a professor at Yale, so I wear lots of hats. I run a lab which is like running a small business and our product is the science we produce and discover, and it's mostly in the regeneration of skin and hair. And then I teach undergraduates introductory cell biology. 260 of them right now.

Alie: 260?! Do you know all their names? Be honest.

Valerie: No.

Alie: You don't? Do you pretend to?

Valerie: No, it's impossible.

Alie: Do they expect you to?

Valerie: No.

Alie: Okay. This is a side note. Quick side note, I was in class in college once, and I tried not to, but I would fall asleep sometimes. And I'm not saying I would fall asleep in your class, this was a different subject. So, I moved to the front row because I knew if I sat in the front row I wouldn't fall asleep. I fell asleep in the front row. Does that ever happen to professors? Do they ever see people sleeping in class and they're like, "I'm going to shoot you with a water gun!"

Valerie: Falling asleep is not as bad as being on Facebook in the class. If someone's falling asleep, I'm like, "They're just tired or whatever." But being on Facebook, it's a special thing that I just, I can't deal.

Alie: Do you lay down any ground rules in the beginning of the semester?

Valerie: I do! Yeah, do not get on Facebook in my class. I find it very disrespectful.

Aside: *[echoey loudspeaker voice]* HEY! Kid at Yale! Farmville and your aunt's parenting memes about wine o'clock? Those can wait!

Alie: Do you ever walk behind them and see like…

Valerie: I walk around. It's a huge lecture hall with two aisles and so I kind of walk up and down.

Alie: Professor Horsley's like, "Do not poke anyone in my class! Not while I am teaching!"

Valerie: Right.

Alie: So, how long have you been a professor?

Valerie: For nine years.

Alie: And now you work in the Horsley Lab.

Valerie: Correct.

Alie: Do you have grandparents who are also scientists or are you a baller enough where they named a lab after you?

Valerie: That's what happens when you have your own lab. It's called your last name and your lab. No one else in my family is a scientist.

Alie: So, the Valerie Horsley lab?

Valerie: Correct.

Alie: That's amazing!!

Valerie: [*Laughs*]

Aside: I did not know that naming your own lab was part of like present-day science badassery. I thought in order to have a Yale lab named after you, you had to literally not be alive. Or you had to be born into a dynasty of people with lab coats and monocles. But no! You just have to work hard and like what you do. So, I googled, "Lab getting named after you." I don't know, just took a stab. And the search return was like a thousand websites about breeding Labrador retriever puppies. Different lab; you can still name it for yourself, though.

Alie: What was it like the day that you had your lab? When you're like, "Oh shit! I have a lab!"

Valerie: The first two weeks I was like, "Oh yeah! I'm a Yale professor! This is so awesome!" And then I freaked out. I was like, "Oh my god, I'm from Alabama. They're gonna tell me they made a mistake."

Alie: Really??

Valerie: Yeah.

Alie: I feel like imposter syndrome is really prevalent among, like, the brainiest people. Which is so painful because I think a lot of very bombastic idiots don't seem to feel like imposters.

Valerie: Correct.

Alie: I don't know why that is. [*laughs*] Was it a culture shock at all for you to go from Alabama to New York to Yale?

Valerie: Yes. I mean, I'm the only person in my family that's ever left the south, since the 1700s.

Alie: What?!

Valerie: Yeah.

Alie: So, do they call you a yankee?

Valerie: [*Laughs*] When I told my family in my grandmother's living room that I was going to take the job at Yale, my aunt sat in the corner and shook her head.

Alie: [*Gasp!*] Are you serious!? But now you work with trichology.

Valerie: Correct.

Alie: And when I found this out, I lost my mind. I like *freaked* out. And why hair and skin?

Valerie: I'm very interested in how the tissues in our bodies maintain themselves. Most of our lives we're pretty okay, we're not sick. And how does that work? Because our cells in our skin and our hair are constantly regenerating.

Alie: Now, okay. Dispel a myth. Like, every seven years, are you a completely new person? Do you regenerate enough where you're like, "I am the same person but I'm all different cells?"

Valerie: It depends on the tissue. It's thought that your skin turns over every two to four weeks. Totally new skin every month.

Alie: Ewwwwwwww.

Valerie: Your intestine… every three days.

Alie: WHAAAATTT?? That's so many makeovers happening.

Valerie: Totally. [*laughs*]

Alie: Whoa! We're the same person, but we're different people. Does that ever trip you out emotionally? Like, if you ever have a beef with someone, are you like, "Well technically they are a different person."

Valerie: No. [*laughing*]

Alie: Okay. I think I would use that to excuse an ex-boyfriend coming back. I'd be like, "Technically…"

Valerie: Well, brains don't really regenerate at the same level as your epithelial tissues, which are the coverings and linings of your body, like your skin.

Alie: Yeah, but we love people's guts. And we hate their guts.

Valerie: Yes, you're right. That's a good point.

Alie: So, every three days… [*laughter*] Okay, so tell me a little bit about skin and hair. Why is it such a different beast than the rest of your body? What is it doing? Why is it such a hustler?

Valerie: So, your skin is your presentation of yourself to the world, but it's also the first way you're protecting yourself from your environment. So, it's there to protect you from any pathogens in our environment. It's also there to hold in the water in our bodies and keep everything inside. And it's going to get insulted by damage, so it has to regenerate.

Alie: Is that a scientific term? Insulted?

Valerie: Sure!

Alie: That'd be so great if you're like, “An insult to the dermis!”

Valerie: Oh yes, totally. I know I've written that sometimes.

Alie: Really?

Valerie: I'm sure.

Alie: It’s more than just a glove slap. It's like sun damage and stuff. Oh my gosh! When did you get so interested in science? You mentioned that there were no Dr. Horsley's to establish your lab before you. So how did you know you were so into science?

Valerie: When I was 12, I took a life science class with Mr. DeYoung [ph.] in Atlanta and I fell in love.

Alie: Reeeeally? With science, not...

Valerie: With biology.

Alie: Not Mr. DeYoung.

Valerie: No.

Alie: [*laughing*] Just checking. I don't want him to get his hopes up.

Aside: P.S.: I really wanted a visual of Mr. DeYoung. I had to know. I wanted to maybe kindly locate him and say, “Heeyyy.” So I creepily researched Atlanta middle school science faculty for like a serious hour, on a Saturday night. Y’all, I got nowhere. I looked so hard. So, I have no visual for you for Mr. DeYoung so I’m just going to picture him as a benign gentleman in a short-sleeve dress shirt, maybe in a striped tie with just the tiniest crust of mustard speckle from lunch and a push-broom mustache the color and density of an otter’s pelt. Wait, I think I just fell in love with Mr. DeYoung.

Alie: So, what was it about science that you loved so much?

Valerie: I love thinking about how our bodies work, like how are we able to talk right now into these microphones, or walk around… just the discovery and the knowledge. You're always learning something new.

Alie: It was kind of the curiosity of it? And why skin and hair? How did your work gravitate that way? What was your path to where you found yourself in a field studying the insults to our dermis?

Valerie: I did my graduate thesis on muscle tissue. How do we grow our muscle when we exercise; that kind of question.

Aside: So, Dr. Valerie Horsley got a bachelors in biology and her PhD in biochemistry and cell biology, but then she was kinda over muscle tissue—well I don’t

know if she was over it, she didn't say that—but she wanted to be trained in a different type of tissue so she headed to the Big Apple to study skin. She did her postdoctoral research at Rockefeller University under Dr. Elaine Fuchs, who is a big deal when it comes to skin and hair science, which is like a whole scene.

Alie: And how are skin and hair kind of lumped together?

Valerie: It's very important that we understand all the cell types that go into making the skin. That's sort of been a major area of research in the last, probably, 15 years, is trying to understand what are all the different cell types that make up the skin. That's one of the focal points of my lab is trying to understand, in the dermis in particular, what are the cells that go into making the skin.

Alie: And, skin is still the largest organ? I know that there's been research saying that there is an inter-mesh under our skin that is now the largest organ. Have you heard of that? Some spongy like fluid-filled, inter-mesh that they're like, "This is a new organ. This is the biggest organ."

Valerie: No.

Alie: Skin is the biggest organ.

Valerie: Correct.

Aside: So, in March of 2018, which is like five seconds ago in historical medical history terms, researchers at NYU may have discovered the largest organ in the body, thus knocking our leathery blood bag right off its pedestal. This, very heavy air-quotes, "New largest organ" is called the interstitium. It is a spongy network of connective tissue made of elastin and collagen and it holds a bunch of your body juice like fluids, lymph, and other things I don't want to touch. Now this newest, biggest human organ made for some pretty splashy headlines but not all doctors are on board. Not all of them are like "Yes! It's the new biggest organ!" So for now, let's just say, skin remains the biggest organ. Which is still weird.

Alie: Why is it an organ? Like, it's essentially fondant. How is fondant a cake layer? Do you know what I'm saying?

Valerie: But it's smarter than that. In my classes I say the covering themselves are not like Saran Wrap. It's not like we just have Saran Wrap, we have smart Saran Wrap, right? It actually has to respond to our environment. If you get sun you get a tan, and that goes to protect you from the UV rays that you might have later. So, you know, it has a function. All of our tissues have a function and the skin is a protective barrier to our environment.

Alie: What the hell is hair doing? Let's get to hair.

Valerie: Hair is also a protective… we call it an appendage.

Alie: No!

Valerie: Yes.

Alie: Really? So, you have millions of appendages growing out of all of your body?

Valerie: Yeah.

Alie: That's disgusting. [*laughter*] I mean, I love it. But it's disgusting.

Valerie: It grows from the same cells that make up our epidermis, the outer part of the skin, during development. And some of those cells are told to be hair follicles and so that's why we have hair in certain places. They're supposed to be in the certain location they grow in.

Alie: "Supposed to be," with air quotes.

Valerie: Yes.

Alie: I'm Italian. So, sometimes you're like, "What are you doing there?"

Valerie: [*laughs*] Yeah, exactly!

Alie: "How'd you get there?" And so, what is the evolutionary function of hair? Why do we have it? Why do we have these long flowing tresses on our scalp? But other hairs give up at a certain length and they're like, "I'm out of here. I grew enough on your thigh. I'm jumping ship."

Valerie: I think the function of hair is warmth and I believe also that there's some sort of social selection probably for why we have hair in certain regions. It's not clear to me why we only have hair that's long on our heads. Whereas monkeys, our next closest ancestor, have it pretty much all over their whole body.

Alie: Oh my god. Can you imagine if monkeys had ponytails?

Valerie: Yes!

Alie: Can you imagine? [*laughter*] There'd be some monkey with one of those ponytails that a dude who works on motorcycles would have. I'm having a moment!

Aside: Hold up. I looked and into this and as Valerie will expound upon, the length of time in the anagen, or growth stage, determines how long a hair can get. The reason why humans may have longer growth phases on head hair could be because we evolved with less body hair, so we needed the head hair for warmth, and cooling, and protection from the sun. Or, it *could* have evolved because styling is a form of looking good to a potential mate. Some evolutionary biologists think that; not all of them though.

Alfred Wallace, who was one of Darwin's contemporaries we mentioned in the Evolutionary Biology episode; he thought that long hair was scientifically whack and he did not think we should have it. He thought the fact that apes don't have long hair but we do, clearly must prove the existence of God. [*Deep echoey Alie voice with heavenly angels singing: "Okay, yes we have a hairless ape, hmmm. Did I already do opposable thumbs? I did? Okay. What about a weird butt? Did I give anything a weird butt? Oh baboons, right. Uh, hmmm. You know what? Let's give this one a ponytail. Yeah? Yeah, that's hot. Let's do that! That's excellent*."]

Alie: Monkeys have all over similar types of follicles. Is it a different type of follicle that makes our head hair grow long?

Valerie: We do have different hair follicles. The thicker hair is different than the thin hair that we have on our forehead. But the reason it grows so long is something called the hair cycle. There's a growth cycle that all of your hair follicles go through. And when it's growing, it can stay there for years, such as on your head, or for a short time, like the small hairs that you have on your forehead.

Alie: So, a growth cycle. What's the typical growth cycle for a body hair?

Valerie: We don't actually know that much about the hair cycles in humans. But we know that the hairs on your head can grow for years and years and years and then eventually the growth portion will die and regress and then it'll just sit there and rest.

Alie: Really? So, your hair is growing, growing, growing. and then at one point it's like [*big sigh*] it just sits there.

Valerie: All done.

Alie: And it just sits there—doesn't grow.

Valerie: Yep. And then there are stem cells that are at the base of the hair follicle that say, "Okay, it's time to grow new hair follicle." So, it'll grow a new hair follicle and then the old one gets ejected. [*getting lower and slower: "Bloink… bloink… bloink."]*

Alie: Can you explain to me… I'm so sorry, I don't know why there is a parade of Mack trucks on my street right now. I'm going to close these windows. Hold on. [*Alie's voice in the distance*] Literally, I'm like, "Is it garbage day? What is happening people?" I mean my apartment is always loud, but that is next level you guys. Come on!

Aside: Note: I paused the recording here to close the windows. And as long as I was up, I got a LaCroix for Aaron. Also, this is not sponsored, but I wish. Because I'll even fuck with the coconut. I drink 'em all. [*Alie, still in the distance*] Frosty LaCroiiiiixs!

Alie: I am a little bit embarrassed that I just don't know this. What is a stem cell? I should know what this is and I don't.

Valerie: Stem cells are cells that are long lived and they have the ability to regenerate themselves as well as form or differentiate into a tissue specific cell.

Alie: Okay.

Valerie: We have stem cells in all of our tissues and we start from a stem cell, the embryonic stem cell, that can build every cell type in the body. But in adults, all of our tissues have stem cells that allow us to regenerate our tissues.

Alie: So, a stem cell is saying is, "Okay, I'm here. I'm going to turn into a new hair follicle." And it starts morphing into a hair follicle.

Valerie: Correct.

Alie: Do you do research on stem cells as well and their potential for therapeutic use?

Valerie: Yes.

Alie: Oh! How's that going? Like in general, for life. For all of us.

Valerie: It's going well, I would say. I believe it's definitely going to be therapeutic in the future.

Alie: When I was a kid I remember... do you remember the Guinness Book of World Records? And there'd be people with the longest nails and hair and stuff.

Valerie: Yeah.

Alie: I remember being about seven and thinking, "When I grow up, I'm going to have the longest armpit hair in the world. I'm never going to cut it." Then I was very dismayed to learn that armpit hair is like…

Valerie: It doesn't grow that long, yeah.

Alie: "Sorry, dog. I'm out."

Valerie: It only has a short growth stage and then it stops growing.

Alie: So, the hair on our head, we don't even know some of it has stopped growing and is about to go buh-boink.

Valerie: Correct.

Alie: Now is it different for different people? Why do some people have really thick hair? I have llama hair, which is presently unwashed and I'm sorry. I wanted to wash it before you guys got here and I just didn't. I just didn't.

Valerie: I can't tell.

Alie: Oh, it's a mess. Why do some people have thick hair? Some people have thinner hair. What's happening?

Valerie: You can have a different number of hair follicles. You can have different size follicles. So, I think blondes tend to have thinner hair than brunettes that can have thicker hair follicles. And it's probably also the structure of the hair follicle that gives you what we call body.

Aside: Sooooo, I did a little follow up on this and blondes, your strands are thinner. At least they tend to be. I don't know if you have more fun, but you do have more strands—around 150,000 hairs while brunettes have around 100,000. Because part of hair's function is to make sure your scalp doesn't turn into sun bacon. So, if you have less bulky hairs with less protective melanin, you're gonna have more of them. If you have glossy, rich dark hair, you're gonna need fewer of them. No matter. Your hair is like a big dead pile of tiny ropes telling the sun to fuck off and find a different head to scorch.

Now, those curls? If your hair follicles are asymmetrical and oval shaped, one side of the hair shaft might have thicker keratin and kind of like a gift wrap ribbon that curls when you shave down one side with scissors... *Boing*! You got springy coils. Now, straight hair is the result of a symmetrical, round follicle. That's whether you're a muskrat, or a sheep, or your cousin, or whatever.

Valerie: So, we use mice for our research and there were some strains of mice that had wavy hair. So we kind of know a few molecules that can induce curly hair because of those genetic studies.

Alie: Do you stare at people's hair?

Valerie: No.

Alie: You don't?

Valerie: No.

Alie: You know, someone told me that we humans shed more in the spring. Is *that* true?

Valerie: I don't think so.

Alie: Okay. I feel like I always get a drain clog in the spring and I'm like, "What the hell is going on?" [*laughs*]

Valerie: It could be.

Aside: I looked this up and apparently a lot of people report more hair loss in the spring—on the upper end of 100 hairs per day is totally normal. Seasonal transitions trigger a different cocktail of hormones your brain has to contend with alongside all of

the pressures of cleaning out your closet, and doing your taxes, and booking travel for all of your friends' weddings. Oh, springtime! So many hormones.

Alie: And then hormones affect the rate of your hair growth as well, right?

Valerie: Correct.

Alie: What are they doing?

Valerie: We actually studied this in my lab.

Alie: Really?

Valerie: Yeah. Especially during pregnancy, people think about this because when you get pregnant your hair is radiant because it's growing from all the estrogen. That's what people think.

Alie: Really?

Valerie: It makes this really great hair. Then as soon as you have your baby, a lot of women lose a lot of hair all at the same time. Part of that is the hormone that goes to making milk for lactation can induce your hair to stop growing. So, it's not that you're really losing your hair, it's just all of the hair follicles are resetting at the same time.

Alie [*gasp!*]

Valerie: They're all ejecting at the same time instead of cycling randomly, which is more like you lose a hair here and there.

Alie: Right. For you yourself, do you think about your work when you… because you have lovely blonde hair.

Valerie: Ah, thank you.

Alie: Do you think about your hair when you're getting it cut or done?

Valerie: Yes.

Alie: Do you think about it, like, structurally because my hair… If my hair could write a book, it would be on Oprah. It would be a sad book about like abuse and stuff because my hair is curly, and gray, and brown, and I straighten, it and dye it red. What am I doing to it?

Valerie: It's okay.

Alie: You sure?

Valerie: Yeah. Because really your hair shaft, that's the part that you see outside the hair follicle, is mostly protein and we call it dead because it's not really living cells that are

reproducing themselves. It's just a fiber that's made into like this rope-like structure that forms a hair follicle.

Aside: It's a dead appendage! You have over five million dead appendages growing out of your body. Can you handle that? We are such weird goofy monsters. [*Deep Alie voice*] It's just beautiful.

Alie: Is it almost like it's alive until it sprouts out of your skin, at which point it's dead? Because it's gotta be alive somewhere in the bulb, right?

Valerie: Correct. There's this very crazy robust structure that makes the hair shaft that we see outside. It's seven different cell lineages that form the hair follicle.

Alie: What? Okay, explain this.

Valerie: At the base of the hair follicle, there are cells that are highly proliferative and they're dividing and making new ones. And those go up into seven different lineages and they sort of make these concentric circles. So, three of them go into making the hair shaft that you see outside. And then three of them go to make this channel that guides the hair out of the skin surface.

Alie: Whoa!

Valerie: Then there's a couple more that sort of allow the regeneration and the stem cells to be maintained.

Alie: So, it's a real teamwork effort.

Valerie: Very much so.

Alie: What's happening when we're lasering it?

Valerie: So, that is killing the stem cells so that it won't grow back.

Alie: And so, when you laser it, you're killing the thing that says let's make more hair.

Valerie: Correct.

Alie: Now I understand that laser works better for light skin, dark hair; that contrast. Like, what's happening?

Valerie: So, the pigment that you see in hair follicles is from melanin, this molecule that's inserted into the hair follicle cells by these cells called melanocytes.

Aside: So, having more melanin in darker hair absorbs more of the laser into that hair follicle and then the heat helps destroy the basal stem cells in the follicle. So, the contrast of light skin and dark hair helps the laser hit the targeted follicles. It's like "Where am I going? Oh! There's one! Boom! There's one!" While it spares damage to the

surrounding skin. Which is why having more skin pigment or less hair pigment makes laser less effective. Laser doesn't know where it's going.

Side note: this whole process was pioneered in the 1990's by an MIT dermatologist named R. Rox Anderson, who seemed very cool. He also came up with some laser therapies for acne and for tattoo regret. Y'all, this is weird. I just researched him a little and no joke he looks *exactly* like the imaginary Mr. DeYoung I was dreaming up earlier to a degree where I'm kind of freaking out and having yet another existential crisis about life being a simulation. Okay, carry on.

Alie: Do you think in the future we'll figure out ways to just tell the stem cells as if we're ordering a cappuccino on one of those machines? Like, "I'd like ginger smooth hair with a little beach wave?"

Valerie: I believe so. I mean there's a bunch of us studying this and we want to understand, how are the stem cells activated? Can we think of ways that we could just apply a cream and say, "We don't want to grow here," or, "Please grow more."?

Alie: Yeah! Do you think that in the future we'll look back at male pattern baldness and be like, "How did we not figure that out sooner?" It'll be like polio or something. Like, "Remember when that was a thing?"

Valerie: Yes.

Alie: Really? What's happening with that by the way?

Valerie: Only a few years ago did we discover that the stem cells are still there when a man is bald or a woman goes bald. The stem cells are just hanging out, but for some reason they can't get activated to regrow. It's an autoimmune disorder where the immune system attacks the hair follicle and basically destroys it.

Aside: Hey, immune system! Just because you protect us from a bunch of gross shit on handrails and subways doesn't mean you can be a dick to hair follicles, alright? Get it together!

Valerie: And so, it stops growing. Then the stem cells can't get activated to form a new hair. If we can understand how to activate the stem cells again, we should be able to grow hair back. There's actually a new therapy for alopecia, which is baldness. It was for immunosuppressants. So, these drugs were suppressing the immune system. And these men started growing big heads of hair.

Alie: Just pompadours, like Elvis-style?

Valerie: Yeah. It's amazing.

Alie: They're like, "Hook me up!"

Valerie: The results are crazy. Yeah.

Alie: Really?! I didn't realize that it was autoimmune in nature because there are certain autoimmune protocols that some patients have to adopt if they have, like, rheumatoid arthritis, or they have other autoimmune diseases. I wonder if that's ever been tried on...

Valerie: Yeah. So, these drugs, they work. It's amazing. The results are really crazy.

Alie: I feel like we'll look back and we'll go, "Aww man."

Valerie: Yeah, remember when all those bald men existed?

Alie: Yeah. Like scurvy. And we're like, "Oh, you just need more vitamin C!" Fascinating.

Aside: So one study that was done on hair regrowth involved something called Cyclosporine, which is a heavy duty immunosuppressant drug that's used in organ transplant recipients. It's a *little much* just to use that to have a flowing mane. But in the last few weeks, it's come out that researchers isolated a protein inhibitor that could be just as effective. It has the super sexy, super catchy name [*sexy voice*] WAY-316606. But they're not ready to start selling it at Walgreens, so put your money away. And if you're like, "I must do more very scientific research on baldness," I found an article on the National Institutes for Health titled, "*Drug discovery for alopecia: gone today, hair tomorrow*." So, props to whoever pushed to get that published because, ya did it.

Also, another study showed that men with shaved heads are perceived as more manly and powerful than those without, so there's an option. I want to tell you that nine out of ten articles about male baldness use stock photos of Dwayne "The Rock" Johnson. That's just science. Now, what if you have the opposite intentions toward your millions of dead appendages?

Alie: What is your feeling, your attitude, toward waxing and lasering? Do you look at it from a scientific point of view and you're like, "This is gonna hurt and I'm not gonna do it" or, "this is going to hurt my poor stem cells." How are you feeling about it?

Valerie: I don't really wax, but I'm not Italian. [*Alie laughs*] If I had to, if it was on my chin, I probably would.

Alie: Right!

Valerie: Or if I had a mustache. But, you know, I just feel like…

Alie: You have fair skin and fair hair, maybe not an issue.

Valerie: Yeah.

Alie: Why do some people get an errant chin hair?

Valerie: I believe what happens, and this happens to me too, like on my legs. I'm like, “Wait a minute, you weren't dark, like, five years ago.”

Alie: Right!

Valerie: I think the hair follicles actually change. They can change. And we actually just discovered a new thing that basically new cells added to the follicle and it makes it bigger and so it makes a thicker follicle.

Alie: New cells are added to the follicle and they're like…

Valerie: “Make a bigger one.”

Alie: “Let's bump this operation up.”

Valerie: Yep.

Alie: I love that they’re like, “Oh, it's later in life, all of my organs are rotting, I'm marching toward death, but we're putting our resources into more thigh hair. [*Valerie laughs*] Are you kidding me? Who's in charge of this? Why does this happen? So mad!

Valerie: Yeah, and let's talk about plucking because we haven't talked about that.

Alie: Oh, my god yes! Okay.

Valerie: So, when you pluck a hair, it actually induces the stem cells to grow. It's like a wound response.

Alie: Oh my god.

Valerie: It's actually regenerating the hair cycle, starting the growth stage again. It takes a while. It takes like a couple of weeks because it has to grow down into the dermis and then make a new hair shaft and grow it out. And that's why it seems like it's better than shaving, but it's actually inducing the growth again.

Alie: Does it grow in any stronger the second time?

Valerie: It actually damages the hair. It's a wound that you're inducing and it can remove some of the stem cells. So it can thin your hair if you pluck the same follicle over and over and over.

Alie: Because I have heard those warnings like don't overpluck your brows because then when bushy brows are back you're going to be so sad.

Valerie: Yeah. I don't know. I think when you're 90, you don't need bushy brows.

Alie: [*laughs*] You have other things to worry about.

Valerie: I think so. [*laughs*]

Alie: Like, why from the waist down you're a centaur covered in hair and you're bald everywhere else. [*laughs*] Aging is a bitch!

Valerie: And you can actually tell by the size of the bulb if it's in the growth stage or not.

Alie: Really?!? Big bulb means growth stage?

Valerie: Yep.

Alie: Oh, that's gross and amazing.

Valerie: Yeah. Those are all the cells that are making the new hair shaft.

Alie: Oh my god! You interrupted them in the middle of their workday!

Valerie: Yes, you did.

Alie: Like, "Where are we going!?" How many people are out there studying skin and hair growth?

Valerie: A lot.

Alie: Do you find it's easier to get people on board, and to get funding, and to have your lab continue because it's something that people care about? People care about their skin and hair more than, say, their pancreas.

Valerie: No, the major funding we get is from the National Institutes of Health. It's a federal grant agency of the government and most of the resources go to cancer…

Alie: Good point.

Valerie: There are skin diseases that cause death, but hair is not one of them. So usually we have to frame our grants in terms of wound healing *and* hair, or something that's going to cause death.

Alie: That's a good point. But it's interesting, it seems like the work that you do is figuring out more about cell biology, regeneration *through* the hair.

Valerie: Correct.

Alie: Because it is so rapidly changing.

Valerie: That's right. So, it's like a model of regeneration.

Alie: Which is why that's your focus, right? Do you have like a holy grail or a white whale in terms of something you're wanting to do in your field? Is there a problem that you're like, "This is the problem I want to solve before I retire?"

Valerie: No, because I think that you have to follow science and go where science leads you. So, every time I've ever said, "I want to solve *this* problem," and then I start to study it, that's never the paper I write.

Alie: Really?

Valerie: Yeah, never. Just because you start to discover something and then you do the experiments and it's telling you something different. So, you have to write the paper about what you discover and write the story about it. So, you just re-make it up.

Alie: Has that been a life lesson for you?

Valerie: Yes.

Alie: It's just not always going to take you where you want to go?

Valerie: Yes.

Alie: And now for example, you're running for Senate.

Valerie: Correct.

Alie: You probably did not expect to be doing that. [*laughs*]

Valerie: No! [*laughs*]

Alie: That's a good dovetail into that. So, wait, how long have you been campaigning?

Valerie: I started my campaign at the end of December.

Alie: So, a few months?

Valerie: A few months, yeah.

Alie: What was the moment where you're like, "I'm a political candidate, let's do this."

Valerie: It's sort of been a progression, but the election of 2016 pretty much sparked it.

Alie: Did you ever have any designs of running for office earlier in life?

Valerie: No.

Aside: Valerie says that the day after the 2016 election she started becoming more involved at a local level. She helped found a grassroots organization called Action Together Connecticut, which promotes calls to action about legislation. And she started

to think, “Huh, the leadership isn’t that strong,” and that it would be a nice thing to have someone in the Connecticut Senate who just shared her goals.

Valerie: So, I was kind of like, “Well, who's going to run for this seat? Who's going to run for it?” hoping that I could use my organization to support that person. And there was no one coming and I was like…

Alie: “I’m the person!”

Valerie: “Why don’t I do this?” So, I was sort of thinking about it and then I decided to do it.

Alie: Yeah. How does your family in the south feel about it?

Valerie: They told me they were going to pray for me.

Alie: Awwww…

Valerie: They're Republicans so, they might not like that it says, “Democrat for State Senate,” on my thing, but that's okay. They love me.

Aside: She’s keen to tackle the budget and also just some nagging everyday gender equality shit.

Valerie: What I'm really motivated to do this for is for my daughters, so that they can have paid family leave, they can get paid the same as a man in their job. You know, these kind of social issues that I am surprised haven't already been won for us.

Alie: What's been the most surprising thing about running for Senate?

Valerie: Hmmm. There's a lot of personal growth. I speak a lot in public and I talk a lot about my science, right? And that's very, “Here's our data.” I can talk about how excited I am about science or skin or whatever. But in the campaign, I had to dig and talk about me and my mom and my grandmother. So, it's very vulnerable. I’m very vulnerable to random people and that's hard. You have to be very brave.

Alie: I bet it's funny in terms of *thick skin*. [*laughs*]

Valerie: Yes!

Alie: I wonder where that term really comes from, “Thick skin?” Is it better to have thick skin or…?

Valerie: Yeah, it's interesting.

Aside: The first use of this term is cited at 1602. So, people have been saying it for a minute. I remember once I saw a dermatologist and I was lying on the table and she was like, “You have pretty thin skin.” I felt like it was a 2-for-1 therapy appointment and I was like, [*wimpy voice*] “I know, right?” Also, Valerie said she’s a big fan of the research

professor and author Brené Brown, who's written a ton about shame and the power of vulnerability. Brown says instead of aiming to have a thick skin and be impervious and shielded, that you should go for a, "Soft front, strong back" approach to life. Be kind to the world but take no shit. Brown also added, "Wild heart," in there somewhere which is kinda nice if you need an excuse to go on an impromptu road trip to a ghost town or breakdance at a bat mitzvah.

Alie: Rapid fire round, you ready?

Valerie: Okay, I'm ready.

Alie: So many questions. *So* many questions. We'll just go through them as fast as we can. Zoe Teplick wants to know: I need to know. I swear I lose so much hair in the shower and through brushing and styling, but somehow I'm not bald yet. In fact, my hair is still thick. How is this?

Valerie: That's the hair cycle. The regenerative cycle. So, when you're losing hair, it's just the normal process of growing a new hair follicle.

Alie: So, it's like, "Don't trip, it's already dead."

Valerie: Yes.

Alie: It was always chilling, taking a nap anyway, before it popped out of there. And some people just have more hair follicles like per square millimeter or something.

Valerie: Right.

Alie: Okay, good to know. So, you're fine, Zoe. Greg wants to know: Are there any alternative natural treatments for dandruff for those of us that do have it and are more prone to yeasts and bacteria that might affect the scalp? How often do you recommend cleaning your hair? What's the best way to do it?

Valerie: Those are good questions. We don't know what causes dandruff. So, I don't know of any natural treatments for dandruff. I think you need to wash your hair when you feel like you need to wash your hair. When it feels dirty or whatever. I have to wash my hair every other day. I use a lot of dry shampoo. I love that stuff.

Alie: Now, that's just absorbing the oils.

Valerie: Correct. So, it depends on how much oil you have, mostly.

Aside: Side note: Despite 50% of the population having dandruff (you are not alone, you are fine, you are loved) researchers still don't totally get dandruff. Most of the prevailing wisdom has been that it's caused by a certain fungus called Malassezia yeast, that secretes acid that inflames your scalp and then causes this high skin cell turnover. But, a few years ago in 2016, more research came out that the levels of fungus were on

par for dandruff sufferers and non-sufferers. But the level of staphylococcus was higher and out of balance with another type of bacteria and that anti-fungal shampoos just happen to kill that staph overgrowth as well. So, microbiome imbalance strikes again!

Greg, I am 1,000,000% not a doctor but maybe look into probiotic foods? I have also read anecdotal stories (see: blogs) that allergies and autoimmune reactions—like undiagnosed gluten sensitivity—can affect inflammation on the scalp. But maybe that's a gut biome imbalance affecting skin? Did I mention, "Not a doctor"? Maybe all of our bacteria is just off and it's just ruining all of our lives. I'm gonna go live in the woods like a raccoon.

Alie: How come we have to wash her hair, but in the wild, animals don't?

Valerie: Well we don't *have* to wash our hair.

Alie: I haven't in a while to be honest. [*laughing*]

Valerie: It probably has to do with how much oil… So, there is another appendage of the skin called the sebaceous gland that pumps oil onto our skin surface.

Alie: Gross.

Valerie: It's awesome! It's very protective. It kills the bacteria.

Alie: Ohhh! So, the oil kills bacteria, like smothers it? Got it.

Valerie: And it moisturizes the skin.

Alie: But we also have yeasts growing on us and that sometimes causes problems.

Valerie: Yes.

Alie: Emily Mankous wants to know: Why is my hair curly? Why does it do that? How does it do that? How does mine twirl all over the place naturally and some people have smooth, straight flowing locks? Is it a protein thing? A DNA thing?

So, we covered this a little bit, but your DNA maybe tells your stem cells what to do?

Valerie: Yes, the DNA is probably telling the stem cells to make a certain structure in the way the proteins are put together to make it curly. But we don't really understand how it's made, what the structure is.

Alie: So, chalk it up to luck. Works for me. Cheryl Freund wants to know: Why does my hair hurt if I go too long between washes?

Valerie: Wow! It hurts?

Alie: I don't know! I've been there before. I've taken it down out of a pony and been like, “Oh, I need morphine.”

Valerie: Yeah. But dirty between washes? I don't know either.

Alie: Okay, I'll look into it.

Aside: Looked into it! Some scientists think it’s that yeast I was just talking about earlier, or the newfound bacteria imbalance doing its damn thing and overgrowing and causing inflammation around the follicles themselves. Also, when it’s dirty, chances are it’s in a nest of a hairball on top of your scalp, pulled up and put in ponytail bondage away from the eyes of the world. And that can also hurt. I want you to know that right now my hair looks like a matted coconut on top of my head and I get it, sister.

Alie: Sarah Wright wants to know: Why does hair grow in differently after losing it due to medical treatments?

Valerie: Oh, that's a really good question. I think it's because the hair follicle changes, like we talked about with the aging hair follicles sometimes. The medical treatments probably will change the number of stem cells, or add cells, or remove cells. Like, chemotherapy kills the active hair, right? But leaves the stem cells. So that's why when you have cancer treatment and you take chemotherapy, you lose your hair, but it grows back because the stem cells are still there.

Alie: And why does chemotherapy kill the hair in particular?

Valerie: It kills the most actively dividing cells that are reproducing and the target is really the tumor, because those are actively dividing cells. But it will also kill your hair, your intestinal cells, that's why people get nausea, and your immune system. Those are the 3 most highly proliferative or dividing cells in your body.

Alie: Why do some types of chemotherapy *not* make your hair fall out?

Valerie: There are different ways that chemotherapy drugs are designed and some of them don't target proliferative cells but do different things. And so, then you don't get a loss of hair.

Alie: My Dad's on chemo and he has a full head of hair. He's had a full head of hair forever to the point where we’re like, “Dad, are you wearing a wig?” He's like, [*manly voice*] “Tug on it. It's all mine.” But he hasn't lost his hair with chemo.

Valerie: That's good.

Alie: He's just hashtag blessed. I mean, other than having cancer. [*uncomfortable laugh*] Sorry, Dad. Anna Marie wants to know: Why do some people have...

Okay, that's another curly hair question. A lot of curly hair questions. As someone with curly hair, this is like… it's our diabetes. It's our thing that we just manage, but we can't cure."

Aside: Side note: I *know* that having hair that expands in humidity isn't as bad as diabetes. Please don't @ me. I'm just saying, both take an intimate awareness of one's bodily management. Also, hair gets frizzier when it's dehydrated because the cuticles are like, "Yum yum yum yes! Gamma that water!" Like your hungover friend at a music festival. Some serums moisturize and others, that are silicone based, just block the water and then they build up on the hair shaft. I have no product recommendations for you, and I apologize. But I'm sure the internet has some.

Alie: Brian Edge wants to know: Why do I occasionally get these really thick hairs in my beard that are much darker than their comrades. What's happening?

Valerie: So again, it's the cells that are attaching to the hair follicle that are making it a different structure. And then it's darker because there's more melanin, that product that's made by the melanocytes, that is pumping into it to make it darker.

Alie: I always think it's interesting how dudes' beards are sometimes like orange, but their head hair is brown!

Valerie: During development, the cells that are going to make the pigment come from what's called the neural crest. And they kind of migrate from the spine area into the different regions. And they populate the beard differently than the scalp.

Alie: [*whispers*] WHAT?! Did you find this out in your research?

Valerie: Not my research, but someone's research. Yep.

Alie: So, red beards. I always wondered about that because I'm like, "It doesn't match at all!" You know what I mean? Like this copper face carpet [*Valerie laughs*] and then like what's happening, you know? [*whispers*] Interesting!

Aside: A little further poking around reveals that red beards are caused by a mutation on the MC1R gene. So, if you have two mutated genes, you're a ginger all the way. But only one of them can cause red hair to pop up in weird places, like for example, your handsome face.

Alie: Mark Larsen wants to know: Can you get stem cells from hair? Like, can you harvest them?

Valerie: Yes! I can! I know how to.

Alie: Really? How do you do it?

Valerie: You take the skin and you treat it with an enzyme that's going to basically break up all the bonds between the cells. Then we can use a machine that we call a flow sorter, where we basically sort them out from the other cells.

Alie: Is there something about their weight or their size that makes them easier to sort?

Valerie: No, it's the proteins that they have on their surface. So, we can use that to our advantage to get them away from the other cells in the tissue.

Alie: It's the proteins but not the carbohydrates? So, this is not glycobiology related?

Valerie: We could use some carbohydrates if we knew. But most often we use specific proteins.

Alie: Okay, now, true or false? You went on a date with someone who listens to this podcast and started talking about science and he knew a little bit about glycobiology. Did that win points with you?

Valerie: True! Yes! *[Alie and Valerie laughing]*

Alie: We win! Is it hard to find people to date who are science literate?

Valerie: YES! [*laughing*]

Alie: Really? So, he's like [*sexy voice*] "Glycobiology…"

Valerie: That's why I love this podcast now that I've discovered it! It's amazing!

Alie: I just wanted to confirm that rumor. Amber and Jonathan Mead have a joint question: How does gray hair work? Why do some strands turn gray earlier than others? I feel like I've seen hair that's gray at the root but not the rest of the strand.

And I will say that my temples are very professorial. They're very George Clooney in the temple area. Why is that?"

Valerie: So, like stem cells that grow the hair shaft, there are stem cells for the melanocytes that put the color in the hair. When those cells die you have a gray hair.

Alie: Ohhhhh!

Valerie: And what can cause that? Stress can cause those cells to die.

Alie: No!!! So that's not a myth? I feel like they always show the side-by-side of before they were president, after they were president.

Valerie: Yeah, stress. Exactly.

Alie: The gray hair is crazy. My grandma—completely gray by 30. She also had 11 children.

Valerie: Wow! Yes. A little stress in there. A little bit.

Alie: Although I feel like you hit a point where you don't even know how many kids you have and they have to raise each other.

Valerie: That's true. Not that I know. I don't have any experience, but yeah.

Alie: Okay, I didn't know that stress can do that.

Aside: By the way, when I was writing this, a friend happened to randomly text me to say she found a hair that was white at the end and darker at the root and I was like "Girl, I'm writing the trichology episode!" And she was like, "Whaatt!? No way!" Anyway, I looked that up and it's called stuttering. A hair can pick up pigment as it grows. It's like, "Oh shit! Whoops! Oops, here you go!"

Alie: I love that our melanin cells are out to lunch, but again, thigh hairs: working overtime. [*Valerie laughs*] Sarah Nichelle says: Is it possible that shaving off all your hair changes the way your hair grows? Or is that just a myth?

Valerie: I think it's a myth. There's really no evidence. But, that said, usually when people start to shave, they're going through puberty and there's lots of hormonal changes. So, they shaved and now their hair is thicker. But it's probably just hormonal changes.

Alie: Would you say this is, "Causation is not correlation?"

Valerie: Correct.

Alie: Okay, have you heard of the no-'poo movement by the way?

Valerie: No! [*laughing*]

Alie: It's no shampooing. I don't know why of all the things, they decided to call it, "No-'poo."

Valerie: I was like, "Does this have to do with poop? Because I don't want to know!" [*laughing*]

Alie: No, no! I'm like, "Can they call it, "Sham-no" instead?" *[clip from Sham-wow infomercial: "Sham-wow! You'll be saying 'wow' every time!"*] But yeah, some people just don't wash their hair. Feelings, thoughts?

Valerie: I don't think it matters.

Alie: Okay. Liana Moss wants to know: What is it about the sun that makes it lighten hair and how does adding lemon juice help?

So, yeah, how does bleaching hair even work?

Valerie: It's stripping the pigment out of the hair. So that's what the chemicals do when you get your hair lightened. That's how I have these beautiful blonde locks.

Alie: No! That's not natch? It's enhanced?

Valerie: It's not natch. It's very enhanced.

Aside: So, I tried to look into this and the heat of the sun opens the cuticle and the acidity of the lemon juice oxidizes the melanin and changes the structure so it appears colorless. This is all on a molecular, microscopic, tiny level.

Alie: Do you recall as a kid looking at cells and hair under a microscope at all?

Valerie: No. I wasn't like, "I love skin! I gotta study skin! I love hair!" [*Alie laughs*] It was more just, "How do tissues regenerate? I'll study skin as a model for that."

Alie: I have a couple of microscopes like, toy microscopes. And I'm not gonna lie to you, I have plucked out a mustache hair and looked at it under the microscope.

Valerie: Yeah? Did you see the bulb at the bottom? That's where all the proliferative cells are.

Alie: I had no idea I was looking at proliferative cells. I was like, "Why is this goddamn thing such a bristle?" [*Valerie laughs*] I'm disgusting. I'm going to die alone. I am. Hairy and alone. [*Valerie and Alie laughing*]

Julie wants to know: What products and/or routines help keep hair healthy and why? Does oil help? Does it help to put coconut oil in your hair, do you think? Or is it dead? Like, get over, it's dead.

Valerie: The structure of what's outside your body can be helped by oils or anything that can help it. I like conditioner because it makes my hair feel like, *ksss*. But in order for your hair to grow, you need good food. If you're starving yourself or on a diet, it's not going to grow as well.

Alie: What about sugar versus protein?

Valerie: Personally, I started doing this high-protein diet and I think it makes my hair grow crazy.

Alie: Really?!

Valerie: Yes. And if you think about it, your hair is full of protein, so I kind of want to do this experiment and see.

Alie: Julio Garcia wants to know: What is going on through your body when you lose a patch of hair? Can severe stress cause you to lose a patch of hair? What causes it to grow back? Thank you!

Valerie: Yes, that hormone that I mentioned, that causes milk to be produced, it also is produced in your body when you're stressed.

Alie: Prolactin?

Valerie: Prolactin. It stalls the hair growth. It tells the stem cells, “Stop!” And so then no hair grows. Then when you're not stressed anymore it comes back, because the stem cells are still there.

Alie: So possibly if your hair is falling out, it is a good smoke alarm saying perhaps your life is on fire a little bit. You deserve to...

Valerie: Get some massages.

Alie: Get some massages, maybe get off Facebook a little bit if need be, or whatever. So, hair falling out is a good indication perhaps there's some stress happening. Or autoimmune stuff.

Valerie: If you see more than normal. Because some people are high shedders apparently, where you shed a lot. That's just their biology.

Alie: But patches could be stress related.

Valerie: Correct.

Alie: [*whispers*] Good to know. Diana Damascan wants to know: I would love to hear some hair myths dispelled.

Any flim-flam that you want to debunk? Anything that people think about hair or skin that you're like, “That is *not* correct.”

Valerie: There’s a lot! Most of the products that we buy, there's not any real biology behind that it helps your hair or not. The only thing that helps with alopecia or balding is Rogaine. So, it keeps the hair in its growth cycle so it doesn't die and not grow anymore. But that means you have to use it every day. Otherwise, once you stop the hair will stop growing and then it will never grow again.

Alie: What chemical in it helps you?

Valerie: It’s called minoxidil.

Aside: So, minoxidil, aka Rogaine, was an accident, kind of. Dr. Charles A. Chidsey was an Associate Professor of Medicine at the University of Colorado, and was doing some trials on a blood pressure medication in the early 1970’s and he was like, “Dang! You test subjects are looking gooood!” The increased blood flow from this blood pressure medication, helped the hair follicle size widen and then it promoted the growth phase of the hair. There was a whole drama with Dr. Chidsey who consulted a colleague being like, “This is crazy, right?” And his colleague was like, “Uhhh, don’t worry about it.” Then his colleague obtained some of the formula unethically from the lab, and then was testing it and trying to patent it behind Chidsey’s back! There was a

whole lawsuit! You go to someone for help and they do ya dirty. It's is like Bravo but with lab coats.

Alie: There's Propecia too, a pill, correct?

Valerie: Correct. Yeah, it's the same drug.

Alie: I remember the ads being like, "If you're pregnant, don't even think about touching a Propecia." I don't know why.

Valerie: Yeah, I don't know either.

Alie: Okay. I'll look into it.

Aside: So Propecia is also known by its plucky name finasteride and it was originally used (also an accident) to treat enlarged prostates. Once again, researchers were like, "You. Look. Amazing!" So, it reduces androgen signaling to the prostate gland and to the scalp. And because it's a hormone disruptor, if you're growing a human, you should not touch or swallow or snort this stuff. Or your tiny baby will be like, "Mom! What? What is this shit!?" 400 million men in America are balding and they spend over a billion dollars a year fighting it.

Alie: As someone who's lived in L.A. and dated actors, I've seen Propecia in many medicine cabinets. [*Alie and Valerie laugh*]

Aside: Also, no judgement! As discussed, I have lasered my entire human body and I pluck mustache hairs and there is no shame in sprucing yourself up. Also, we're fine the way we are. So, if we want to, let's spend that money making more waterslides and having more pet weasels.

Alie: Celeste Marie Ward Altus wants to know (P.S. She's my sister. [*DJ airhorn*]): Why can some people grow their hair really long and others can't?

By the way, my sister has amazingly long hair and her husband is a heavy metal guitarist whose hair is to his waist. So, she doesn't seem to have this problem, but she must be asking for others.

Valerie: This is again how long it stays in the growth stage. So, if it stays there for many years, you can get really long hair. Who was that woman in the '70s that had her hair...

Alie: Crystal Gale!!!

Valerie: Yes!

Alie: Crystal Gale, I can't think about hair and not think about Crystal Gayle! I could not tell you what song she sang, but I do know that she had hair to her ankles.

Valerie: To her ankles, right? She had a *long* growth stage.

Alie: She also had a lot of resolve. Because at some point I'd be like, "I flushed my hair down the toilet again?? [*Valerie laughs*] You're out of here! Get me the clippers!" Do you know what I mean? I don't have time for that shit! Can you imagine?! Her plumber's like, "Never cut it, bitch!" [*Alie and Valerie laughin*g] I wonder. I got to look her up and see what she's doing.

Valerie: Yeah, exactly! Did she cut her hair?

Alie: I hope she's got like a, "Kate Plus Eight." [*Valerie laughs*] Just a spikey little up. She's like, "I had it."

Aside: Quick double check: Country singer Crystal Gayle from a few decades back is actually Loretta Lynn's younger sister. I did not know that. Also, I don't think she *ever* chopped her hair off. It was down to the floor. She said that in terms of extra care, it's like having another child. But it's her trademark! What are you gonna do? If you're gonna pick a trademark, I say do something less labor intensive like, "I'm an adult who wears a bib all the time. That's my deal."

Alie: So, Celeste Marie Ward Altus and her husband Lee—probably long growth cycle. And their daughter Sophia—long shiny hair. So, I guess it's in the genes. I have llama fur.

Eva wants to know: Do hair and nails grow at different rates? In your work researching the regeneration of skin and hair, are nails, kind of, part of the same bag?

Valerie: Nails are also an appendage and they have their own stem cells and we're just starting to learn about those. I don't study them, but there's a woman in New York that I know that does.

Alie: Do they have different rates? Like, can your nails grow really fast but your hair is like: *Bum. Ba dum. Ba dum*. That's the international noise for slow.

Valerie: Yes, they definitely have different rates.

Alie: Okay, we did talk a little bit about protein and hair growth, but let's talk about biotin gummies that everyone on Instagram is pimping out. Does biotin and other vitamins, like B vitamins help your skin and hair regenerate faster?

Valerie: I don't know of any data to suggest that that is true.

Alie: Good to know. I did start taking biotin for other reasons. Once a doctor recommended it. My face broke out like *crazy*!

Valerie: Oh, yeah? I kind of want to study biotin and see if it really does work.

Alie: Holler. Just text me from the lab at midnight and be like, "Bingo. Get your gummies!" Jennifer Overbye asked: Can your hair turn gray if you get really scared or is that just a thing that happens in cartoons?

Valerie: Cartoons.

Alie: Yes. Oh my gosh. Jonathan Robinson says that he visited the Museum of Human Hair.

Valerie: [*gasp!*] Where is that!?

Alie: Independence, Missouri.

Valerie: Oh my gosh! I need to go there!

Alie: And he saw a distressing number of family trees constructed entirely of hair, presumably from the family members represented. So this, and the entire museum really was the stuff of nightmares. Have you ever heard of family trees constructed out of hair?

Valerie: No!

Aside: So, here we go. This place is in a building that looks like it would house your mom's suburban dentist or a chiropractor but it's called Leila's Hair Museum and it costs $15, cash only, to get in. It was started by a hairdresser who was so taken with a tiny wreath of woven hair that she began a frenzy of collecting more and more memorial pieces and hair art, including elaborate woven sculptures and clippings from (are you ready for this list?) Marilyn Monroe, Michael Jackson, Queen Victoria, Elvis, JFK and Lincoln. WHAT!? According to the website, Leila's Hair Museum is the only hair museum in the world. It has over 600 hair wreaths, 2,000 pieces of jewelry made of human hair. The website then informed me that, "There are neckpieces called sepia, which is a scene, painted with pulverized hair. When hair is pulverized into a powder it can be mixed with paint and used as a medium for painting scenes."

I want to note that at the time I was writing this, I was feverishly trying to finish this episode. I went all morning without eating, and had finally taken a break to make a smoothie, right as I started poking around this site. And I was like, "Oh man! I'm drinking a smoothie! Pulverized hair?? I'm out!" But if you're in Independence, go and report back.

Alie: I think more like a found objects collage.

Valerie: Wow. No.

Alie: I'm going to look it up. I'll explain to you if I see pictures. Mike Melchior says: What's the deal on this chemical in McDonald's fries being a baldness cure? Asking for me.

Valerie: Um, no. That's all I'm going to say about that. [*laughing*]

Alie: Government propaganda.

Aside: So recently a team of Japanese scientists were studying, "*Shaft generation upon intracutaneous transplantation into the backs of nude mice*" using this substance that is also used when frying McNuggets and french fries. Now, the ingredient itself doesn't help hair grow, but it helps the thing that does. So, between an unpronounceable chemical that prevents oil foaming in McDonald's fryers, and the backs of nude mice, and the pulverized hair, I am never finishing this smoothie! I'm never gonna finish it! I can't do it!

Alie: Lexie Fetter wants to know: I find it repulsive when other people's fallen-out hair touches my skin. Is this a condition? What would be driving me to have this reaction?

It's funny though because if a hair is attached to someone's head and it touches my arm, that's fine. But yeah, as soon as it's out…

Valerie: Yeah. I think it's gross, too. Like the hair in the drain and you have to get it out. Ugh. I don't know, maybe it's something about bacteria and disease?

Alie: It must be something ingrained that were like, "That's a dead appendage."

Valerie: Yeah, that's been hanging out.

Alie: Have you ever used one of those Velcro drain snakes?

Valerie: Yes.

Alie: They work! [*laughing*]

Valerie: Yes. And it's gross.

Alie: It's so gross! You can get them for like $5 or $6 in the, "As seen on TV section." It's just like a wire with a piece of Velcro. I've pulled out things the size of rats! It's so gratifying and it's disgusting. It doesn't smell good. I don't know if you've ever smelled it, but it doesn't. [*Valerie laughing*] Every spring I'm like, "Oh, it's about that time."

Valerie: Ugh, drain cleaning season.

Alie: Yes! [*laughs*] So gross.

Aside: I am so thirsty, and so hungry. Why is this episode so gross? Also, get one of those Velcro drain snakes instead of Liquid Plumber for hair clogs. It's better for your plumbing and probably the environment. It's disgustingly satisfying.

Alie: Michelle Sullivan wants know: When I was younger and just started shaving my legs, I would turn on the cold water in order to give myself goosebumps because when I shaved, while having goosebumps, it always seemed to give me a closer shave. Is there any truth behind that or was I just a total weirdo taking cold showers?

Valerie: That's actually a really good question! Goosebumps are caused by a muscle that's attached to every hair and the goosebumps pull the hair up and make it stand up.

Alie: Is it the arrector pili?

Valerie: The arrector pili muscle, yes! And so, I can imagine that it pulling up would push more of the hair shaft out of the skin and so I think she might be onto something.

Alie: I keep thinking, what if you got goosebumps enough where you shave the goosebumps off?

Valerie: Yeah, they're not that raised.

Alie: Okay, that's a good tip!

Valerie: Yeah, it is a good tip. I'm curious about that, but I can't imagine that it's that much hair growth for what it's worth in a cold shower.

Alie: That's a good point. Diminishing returns.

Valerie: Yeah. I feel that's true.

Alie: So, what is the hardest part about your job? What's the crappiest part?

Valerie: Grant writing, right now.

Alie: Oh, grant writing. Really?

Valerie: The funding level for the National Institutes of Health is *terrible*. It has not been raised, really at all, since Clinton—since I was in graduate school.

Aside: So, Valerie tells me that right now 14% of grants actually get funded. They're 12 pages long to write and there's an 86% chance you'll get denied.

Valerie: So, it's just a lot of writing for no's, no's, no's. I don't really want to be great at writing grants. I want to be great at doing science. It's different.

Alie: But, you can't do the science unless you submit the grant and unless it's one of the 14% that's approved.

Valerie: Correct.

Alie: So, a little bit more money for grants would be nice.

Valerie: Necessary! I really think we're in a crisis.

Alie: Do you think that it's affecting the number of people that go into research?

Valerie: Definitely.

Alie: So, grant writing can suck it!

Valerie: Yeah.

Alie: [*laughs*] What's your favorite thing about what you do? What makes you super, super excited?

Valerie: Discovering new things about biology is awesome, but I think also mentoring the students and watching them grow over the years is really amazing.

Alie: Awwww… Just seeing them grow their own hairy wings and fly!

Valerie: Yeah, they become little scientists. It's very cool.

Alie: So, future of hair: any predictions?

Valerie: I do think we'll be able to control hair growth in a different way, probably. In the '50s there was a lot of hair research. And probably in the 2000s when we discovered the stem cells, there's sort of been a renaissance in hair research. And so, there's lots of hair researchers now. We're learning a lot. It's crazy! The hair follicle is crazy. It's so complicated. It's amazing.

Alie: I love to know that there are some dead ones hanging out, just waiting to jump ship.

Valerie: They're ready!

Alie: [*laughing*] In all the wrong places!

Valerie: And the stem cells are like, "Aaaaah!!! I gotta regrow!!" Yeah.

Alie: Thicker! Faster! Wiry-er! [*laughter*] You're like, "No!! Mixed messages!!" Oh my god. This is so fascinating. I love this episode. I had no idea that I'd get to talk to someone about trichology! This is amazing! Thank you so much for being on.

So, remember, feel free to ask smart people all the dumb questions you want, because they're super nice and we're all going to die anyway. To find out more about Dr. Valerie Horsley's work, you can visit horsley.yale.edu, and to learn more about her campaign, you can check her out on Twitter and Facebook at the handle @ValerieforCT, or you can look up her grassroots organization, Action Together Connecticut, if you are so inclined.

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submit your questions to the ologists. And you get to know what topics are coming up next, for as little as 25 cents an episode. A dollar a month gets you in.

You can also support by buying merch at OlogiesMerch.com. Thank you Boni Dutch and Shannon Feltus for helping manage that. Nick Thorburn wrote and produced the music. And if you stick around this long you know you get a secret, right? Did you know that? Is this your first time listening this long? Anyway, at the end of the episodes, I tell you a secret. I'm gonna Brené Brown myself and be vulnerable and say that I really love discovering I have a hidden zit on my scalp because it's like, "Ooooh I have a secret pimple I get to check in on! No one knows about it!" Also it's springtime and over the course of just this last week my shower drain has slowly gotten slower so you know what that means, baby! My reward for sending all these asides to Steven is I'm gonna let myself snake the shower drain later to see what horrors lurk within. I'm sorry this secret is gross. Please, very sincerely, never send me pictures of your own drain clogs. I will barf. Okay, thank you. I hope you're not having smoothies. Berbye.

Transcribed by: Christine Whitley / Fairfield, CA

Some links you might find useful:

IS skin the largest organ?

Let's talk about monkey ponytails

Get to know your curly hair

Why you get springtime drain clogs

Gone today, hair tomorrow

Maybe this will give you a furry scalp

Humidity: your hair's greatest foe

Serums and your unruly do

What's up with your ginger face carpet

No pain, Rogaine

Stress and grey hair

Does your dirty scalp hurt?

Diet and derm

Maybe your bacteria are fighting and making dandruff?

Behold, a Trump hair diagram:

Follow this cool Instagram

Redheaded sensitivity

But also redheads are very tough

Go to this hair museum

Eat McDonalds, grow hair on your nude rat back

Valerie Horsley is running for state senate

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