

Biological Anthropology with Lara Durgavich

Ologies Podcast

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Oh heeey! What's up? It's your brain, who refuses to do anything unless there's a water balloon's worth of dopamine dumped on it, Alie Ward, back with the hairiest sexy episode of *Ologies*. What the hell does that mean? Well, Trichology was about hair, Sexology was about sex, but this? This one is the hairiest, sexy episode because it's about apes getting it on! And, hey, guess what? We're also apes. Ooooh yes.

But hey, I have an idea, what if we thank the folks at [Patreon.com/Ologies](https://www.patreon.com/Ologies) for tossing 25 cents an episode at us, keeping this podcast possible. And also told you that if you need holiday gifts for fellow Ologites there are some up at [OlogiesMerch.com](https://www.OlogiesMerch.com). Also, if you rate and subscribe to the show it keeps *Ologies* up in the charts. And also reviewing makes my day. What if I told you all that? Well, I already did. MeggieMooger said:

It's the episodes I'm least excited about that become my favorites.

Meggie is a nurse; thank you for literally saving lives while I talk about crotches. As your dear, wizened Internet Grandfather I read every single review. They bring tears to my milky eyes, so thank you for doing that.

And now let's get etymological on this. Biological Anthropology: it comes from the study of the life of people, and really it means the biological and behavioral aspects of human beings, of their extinct ancestors, and related non-human primates. Think of this as: How to Sex: Ape-Style. This Ologist and I met via the internet, and much to our mutual, like, [*frustrated, breathy yell*] "GAH!" we had already covered Primatology way early in episode two, which is a great episode by the way.

But *this* scientist this week did her PhD dissertation on ovarian function and reproductive behaviors across the female orangutan life cycle. She's been a lecturer at Boston University, she's been a Harvard University fellow, and a TED speaker whose talk on gene mutations has, at present, 1.6 MILLION views. She's a current lecturer at Tufts and is also a Biological Anthropologist. Boom.

We recorded this months ago, back when the lockdown first started actually, but I wanted to give it some space from the Neuroendocrinology episode about sex and gender. That was in June, so I've been saving this as a post-companion piece to that, kind of like a special piece of Halloween candy you'd find in a pocket. It's all about primates getting it on. It's literally the thing that drives us every moment of every day.

So go look in the mirror and whisper, "You sexy ape," and then get ready to hear about mating behaviors, ovaries, sperm counts, exotic dancers, biological clocks, presidential roosters, cramps, the pope, male birth control, hormones and moods, and lots and lots of orangutan pee with Biological Anthropologist, Dr. Lara Durgavich.

Alie Ward: Yaaaaay, so you're here!

Dr. Lara Durgavich: I'm here! I'm so excited to be here!

Alie: Let's go into your background. You were a college fellow in the Department of Human Evolutionary Biology at Harvard.

Lara: I was! I was.

Alie: A lecturer at BU also, right?

Lara: Yes, I bounce around a lot in the Boston area. I did 5 years at Harvard and then last year I was teaching at Tufts University. This year I'm teaching at Boston University and next year I'm going back to Tufts University, so I am itinerant. I work as adjunct faculty because I decided while in grad school that I was not cut out for the tenure-track lifestyle, so I have been jumping around to where opportunities are available. I've been very fortunate so far to be able to keep finding them.

Aside: Okay, confession from a non-academic, which would be me. I know that tenure is supposed to be, like, a good thing to attain, but I'll be honest, I don't really know what it means or how it works. But Dr. Durgavich basically says it means you work there permanently and you can only get fired or lose your job if something egregious happens. As much as permanent employment is great, she says she just knew that that path wasn't right for her. It's a pretty old system, and to get tenure there's a lot of ranks-climbing and sacrifices personally, she says.

Lara: It is just not very friendly, especially to women because we often bear the brunt of childcare labor, and so I just decided... In grad school, I thought, "You know what? I love teaching but I'm just not cut out for what is often called the 'publish or perish' lifestyle."

Alie: When you were thinking about having kids, did you think back to your research on ovarian function and orangutans? Was that in your mind?

Lara: I guess it was in a sense because I actually got pregnant with my daughter when I was in grad school, so I was still doing my research when I was pregnant and then wrote up my dissertation after she was born. It was certainly something I was spending a lot of time thinking about, but the focus of my research had a lot more to do with the relationship between age and hormones and the relationship between hormones and behavior. It wasn't directly related to pregnancy, although as I say, I definitely was spending a lot of time both surrounded by orangutan urine and thinking about their ovaries during the whole period of my pregnancy. [*Alie laughs*]

Alie: What got you there? What got you to research this? What were you like as a kid? Were you an outdoor kid? I know you mentioned that you wear glasses partly because your nose was in a book when you were a kid.

Lara: That's true, yes. Less so today, just simply lack of time. Yeah, I spent a lot of time reading, definitely, but I also did love being outdoors. I had an exceptionally average suburban childhood. I think what ended up getting me where I was... I got to college and I had no idea what I wanted to do. They eventually said, "You need to declare a major," and I said, "Okay." I picked anthropology because at the time I was really interested in archaeology. I studied anthropology as an undergrad at Boston University. My initial plan had actually been to study stress hormones and look at the relationship between stress hormones and captivity. I was really interested in how different forms of environmental enrichment in captivity could affect stress and behavior. I had a whole project planned out and was ready to go with that and then at the last minute the rug got pulled out from under me.

One of the places that I had been planning to do the research said, "I'm sorry, you can't come anymore," and then my advisor at the time ended up leaving the university, and so I got thrown into a very sudden limbo. [*"I'm in purgatory."*] I ended up having to go back to square one. One of the professors who joined the department at that time – this was back in 2007ish – was a woman named Dr. Cheryl Knott. She is a primatologist as well who has a

research site on Borneo where she studies wild orangutans. She came in at the time and I said, "I don't know what I'm doing!" She helped me basically salvage my PhD, helped me figure out a new path that was focused more on reproductive hormones. So that's how I ended up doing all the work that I did and having access to all this urine that I had access to, which was so fun.

Alie: *[laughs]* I love that you have "access to urine." *[laughs again]* I'm just picturing a walk-in closet full of jugs.

Lara: That's not terribly far off! You've got these large freezers that are full of boxes with test tubes, so it's very clinical. It suited my purposes perfectly fine.

Alie: Had you met your husband by that point?

Lara: I had, yeah, we actually met in undergrad.

Alie: Okay, yeah, because you were pregnant in grad school.

Lara: I was. I didn't put my life on hold during grad school. I went ahead and got married, and got pregnant, and just kept doing stuff.

One of the lenses that I was using when I wrote up my dissertation was, "How do the ovarian hormone levels that we see in captive orangutans differ from what we see in wild orangutans?" We know already that, in general, they're going to have higher hormone levels in captivity just because there are fewer energetic challenges, there are fewer immunological challenges. We know this from the field that is called Reproductive Ecology, which studies the relationship between environment and reproductive function. We have studies from humans and a number of different non-human primate species now that show there is a very clear link between environmental variability and ovarian function.

Alie: Oh, really?? Oh my gosh. Oh no!

Aside: As a person with inexplicably broken ovaries in my early 30s, I found this terrifying and exciting.

Lara: I knew going in that the apes' hormone levels in captivity were going to be higher, but I was interested in asking questions about variability. I was especially interested in looking at different transitions in their life stages. I was like, "What's going on with their hormones in adolescence, and does it look like what goes on with human hormones in adolescence? And what's going on with their hormones when they get to be 40 or 45 years old, and is there any sign of anything approximating menopause?" So I was looking at both ends of the life cycle. For the individuals that were in the middle I was looking at records of mating behaviors, because in captivity they can keep really detailed records of who's mating with whom, when, and what kinds of behaviors are involved in that.

Alie: *[laughs]* Zookeepers are like TMZ! They're just out there!

Lara: They are! Maybe I'll take a picture and send you some of the data sheets so you can see what it looks like where they're like, "So-and-so approached this orangutan and they, you know..." *[Joey from Friends: "How YOU doin'?"]* Orangutans are actually... Relative to species like chimpanzees and gorillas, they're actually fairly sexually adventurous, and so some of the records are quite interesting.

Aside: Aside from the thrill of hot gossip, why was she elbow-deep in spreadsheets about orangutans boning, surrounded by freezers full of their urine?

Lara: I was basically looking for those adult-age individuals, at whether there was any impact on what their hormone levels looked like in the females in a given cycle, and whether they were more attractive to the males, or whether the females were more interested in mating if they had higher hormone levels. I was looking at a spectrum of different things.

Alie: We're more closely related to chimpanzees, correct?

Lara: We are. We share more of our DNA with chimpanzees, I think it's 98-point-something with chimpanzees and then with orangutans it's down to about 97%.

Alie: But is that still so correlated? 97% is still so much.

Lara: It's very high, and if you look at the reproductive hormones and the cycles, they are all very similar. Actually, orangutans are more similar to humans than gorillas and chimpanzees in a lot of aspects having to do with reproductive cycles. Chimps and gorillas actually have slightly longer reproductive cycles. Chimpanzees have that very obvious, what is called 'sexual swelling', during the midpoint of their cycle where they get this big balloon of tissue in their perineal region and that is very attractive to males. It's a very clear signal that a female is ovulating.

Aside: Humans, sadly, don't have a horny Bloomin' Onion of a taint. But we *can* signal to potential mates by posting TikToks of us dancing to Megan Thee Stallion. Which, I'm gonna get real with you, I had to google some sexy TikTok trends to obtain that reference. In doing so I just learned that I need to get rid of my side part because it's not 2013. Anyway, having an inflated anal region sounds way easier than trying to flirt online.

Alie: I love the idea of chimpanzees just doing makeup tutorials on, like, "How to look like you have a bulbous taint!" [*Lara laughs*] Overlining!

Lara: The sexual swelling is something that you find in chimpanzees and bonobos. There's a very slight one in gorillas, but then a lot of different, what are called, 'Old World' monkeys – which basically just means that they are African or Asian – like the macaques and other species have the sexual swelling as well. There was great research back in the day where they were trying to determine whether it actually was a sexual stimulant for males. They would take females in captivity and take out their ovaries and then attach this plastic sexual swelling to their rumps and put them around males and the males would get excited. [*Alie gasps delightedly*] Even though the underlying hormone wasn't there, they would still get excited by this visual signal. Yeah, it's kinda funny.

Alie: Someone's out there making prosthetic taints.

Lara: Yeah, prosthetic swellings.

Alie: I bet they're great at dinner parties. [*Lara laughs*] You know, I think that we all hear these things, and I don't know if this is total flimflam, but someone who is, say, a professional dancer will make more in tips around ovulation. Is that flimflam or is that true?

Lara: That is flimflam. I know the specific study that you're talking about because it made a lot of headlines when it was published.

Aside: This 2007 study is titled "Ovulatory Cycle Effects on Tip Earnings by Lap Dancers: Economic Evidence for Human Estrus?" It was authored by three people who do *not* have ovaries or estrus, which is the period when you're not on your period and you can get knocked up. I always feel like when a house is in escrow it sounds way too much like estrus. It

seems ripe and eager and I'm just vaguely inclined to avert eye contact. But yes, since this study is oft-quoted, I'm just going to quote it directly:

18 dancers recorded their menstrual periods, work shifts, and tip earnings for 60 days on a study website.

These results constitute the first direct economic evidence for the existence and importance of estrus in contemporary human females in a real-world work setting.

... they continue, patting themselves on the back.

Lara: If you go back and look at the methodology of that study there are some big problems in the way it was executed. So, the idea that people can pick up on ovulatory status in human women, that idea is not entirely flimflam. There are studies that show that people can look at photographs of women who are ovulating versus non-ovulating. So, there's a little bit of disagreement, depending on what study you look at. But the particular idea that strippers or dancers are going to make more in tips when they're ovulating that grew out of that study, that is flimflam.

Alie: Ooooh my gosh, finally the myth is busted!

Lara: Yeah, it's also not true that women who are living together cycle together, which a lot of people think.

Alie: [*surprised*] It's not??!

Lara: Nope, not true.

Alie: That's not true? I think there's probably so many roommates that are quarantined right now, waiting...

Lara: [*chuckles*] That's true. It can happen just because of statistical likelihood, but there is nothing pheromonal anything like that, that causes women to start cycling together if they're living together.

Alie: I have a friend who says that she gets her period when the moon is full. I was like, "Well, wouldn't that just be 28 days?" She's like, "No, sometimes it'll be off and then all of a sudden the moon is full and it's a week early." Does that ever happen? Is it tied to the moon?

Lara: Not to the best of my knowledge. I don't think that I've ever seen anything that has empirically established any kind of lunar cycle. It certainly is possible that that could happen anecdotally for her because we all have it in our heads that the human cycle is 28 days long. The truth is that there is a *ton* of variability around that, both from woman to woman or person to person. One person's average might be 26 days, and another person's average might be 32 days. But also, from cycle to cycle. I could have a 28-day cycle one month. Then my next cycle could be 33 days, and the cycle after that could be 27 days. So, it's not like your body has some kind of specific internal clock that it's keeping. There's a lot of variation.

Alie: What about people who don't have ovaries? What about boys and people with testicles? Do they have anything cyclical? Or are they even-steven?

Lara: I mean, there are things that can affect testosterone production. It is not as nearly as responsive to environmental variability as the ovaries are. I don't know of anything cyclical in testosterone production other than the fact that testosterone production has a circadian rhythm. So, testosterone levels are always higher in the morning than they are in the afternoon or evening, but I don't know of any monthly variation in testosterone.

Alie: Is that why dudes wake up with boners, or is that just so they don't pee the bed?

Lara: *[laughs]* That's a good question. I actually don't know the answer to that question. I mean, certainly, testosterone is necessary for erectile function, but I actually don't know because most of my scholarly work has been focused on females. I actually don't know whether there's a direct link between high testosterone levels in the morning and waking up...

Alie: Boners! I am going to go tippity-tap. I'll figure it out.

Lara: Yeah, you'll have to put that in an aside.

Aside: Okay, I looked it up. Do morning boners have anything to do with testosterone?

It's been long established: Heck yeah. According to the 1990 study, "Testosterone replacement therapy and sleep-related erections in hypogonadal men," penis owners with an androgen deficiency can still have normal 'penile nocturnal tumescence', as it's known by its clinical name, but sleep-related erections increase in response to testosterone administration, it says. So yeah, you can still have sleep boners, but you'll definitely have sleep boners if you're on T. Also, these swellings can happen even while in the womb. *[whispers]* A fetus can have a boner.

I have a friend who is not a morning person and does not appreciate being spooned with a little tap-tap-tap on her lower back. She considers herself the founding champion of a movement called, "Pancakes, Not Boners."

But hey, before you think that penis-havers have all the nocturnal tumescence fun, there is such a thing as NCT, where the P-word is swapped with a C-word, my clit owners. So, sex and hormones: we're in it, and they're in us.

Alie: Okay, sex hormones. What exactly are sex hormones? Which ones are the ones in play? Some people might not know that, like, women have testosterone and males have estrogen.

Lara: Yeah. So, sex hormones is kind of a broad umbrella that, usually when somebody is referring to sex hormones, they are referring to estrogen or progesterone, which are hormones that are primarily produced by the ovaries in women. Although men also have estrogen and progesterone. Then testosterone and other, what are called, 'androgen hormones', which is basically just a family of hormones that testosterone is in. Those are produced, again, mostly by the testes in males, although women also produce testosterone. They're all very closely related.

They're all actually derived from cholesterol. The way that you get an... I am *not* a molecular biologist, so I'm not going to be able to go into this in a ton of detail. But the way that you get from cholesterol to these different sex hormones is, kind of, small changes along the way. You remove things along the way. So, you can turn cholesterol into testosterone, then you can turn testosterone into estrogen. They're all really closely related.

So, everybody is making all of these hormones. There are no "male hormones" and "female hormones." There are differences in average concentrations of those hormones between men and women, but yeah, everybody's making everything.

Alie: What's like the cast of characters? What do they tend to do? What does estrogen tend to affect? What does testosterone do? What does progesterone do? Is oxytocin a hormone?

Lara: Oxytocin is a hormone, but it is not one of these steroid hormones. Oxytocin is actually a hormone that is produced by the pituitary gland, and so it has its own whole set of diverse functions. But there are times in which oxytocin has really important interacting effects with

reproductive hormones. So, oxytocin is really important during lactation because it is the hormone that results in milk letdown. And then, oxytocin is important during sex, it's released during orgasm. It's important during pregnancy and labor. Oxytocin is doing its own whole set of things.

But in answer to your first question with estrogen and progesterone, they do other things, but at least in terms of reproductive function, estrogen is basically what is being produced as eggs or follicles are maturing in a given cycle. There is an estrogen, kind of, buildup across the first part of the cycle and that's what triggers another hormone called luteinizing hormone which is what causes ovulation to happen.

So, estrogen is really important during the first part of the ovulatory cycle, what's called the follicular phase of the ovular cycle. That's when the group of eggs that is, kind of, "recruited" in a given cycle, because women are born with all the eggs we'll ever have. So, each month roughly there's a group that gets "recruited" and those develop and those are producing estrogen.

Then in the second half of the cycle, what's called the 'luteal phase' of the cycle, that's when you get more progesterone production. That's really important for building up the endometrial lining of the uterus so that if fertilization takes place you have a uterus that's ready for implantation. Then they do all kinds of additional things during pregnancy and so forth. But that's the basics of what estrogen and progesterone are doing across the average ovulatory cycle.

Then testosterone would be a much longer answer. *[laughs]* Testosterone is important for sperm production. There is kind of a threshold level of testosterone that males need for libido. *["Yeah, I feel sexy!"]* But then testosterone has all these other functions. It's an anabolic steroid, as I'm sure people are familiar with. There's a reason that when guys want to get jacked they take testosterone.

But, it also has relationships to confidence and positive mood. It has a relationship to aggression that is really complicated. It is what is responsible for what we call 'secondary sexual characteristics' in men. So, testosterone is what is driving facial hair growth and changes in voice, for example. So, testosterone does a lot of different things.

Aside: All of my brothers and NBs on T right now, I wish your whiskers and your baritones the best. We're going to talk more about this in a bit.

Also, Dr. Durgavich says that its relationship to aggression is really complex, which we also heard in the neuroendocrinology episode with Dr. Pfau, who said that suddenly having changes in hormones could cause alterations in behavior. So, hormones: a real chin-scratcher.

Alie: Is it responsible for the random chin or mustache hairs women get?

Lara: Probably.

Alie: Really!?

Lara: Super annoying, right?

Alie: Yeah, you just got that one bristle that you're like, "Goddammit! Are you back??"

Lara: Yeah. Yeah, there's also a great study that was published anonymously, I want to say around the 1970 in *Science* magazine, where there was a guy who was doing some kind of research alone on an island. He would periodically go back to the mainland and visit his significant

other. He started noticing that when he was getting ready to go back to see this significant other that his beard would start growing more quickly.

So, he actually started charting. He started shaving and measuring his beard growth and charting it with what was going on with his calendar. He was able to determine that the anticipation of a sexual resurgence was actually, he said, increasing his testosterone, which was driving additional beard growth. So, there's some fun stuff in the literature.

Aside: Fun stuff, such as this nugget:

Lara: Have you ever heard of the "Victory Effect"?

Alie: No! What is that?

Lara: So, the victory effect is a thing where... It was actually first demonstrated, I think, by an undergraduate at Harvard as part of his senior thesis. He was studying members of the wrestling team. He would take testosterone measurements before and after wrestling matches. He was able to show that if you won, testosterone went up. If you lost, testosterone went down. That's a phenomenon that's been supported and other people have found it in a variety of different settings now.

They have actually extended it. Not only do... In a competitive setting, not only do the winners see testosterone increases and the losers see testosterone decreases, but fans will actually experience that. There's a vicarious effect that happens, and it doesn't have to be in a "sporting" competition. They've done it with chess players and they've found the same kind of thing. There's some really cool stuff out there about the way testosterone is impacting an individual's confidence, but also the way that it is responding to circumstances. So, it is not unidirectional. It's a very bidirectional, complicated thing going on.

Alie: That might explain why in LA, when our teams win, we *still* set fire to stuff. [*both laugh*] Like, "Come on, what are we doing here?"

Lara: Yeah. Well, I live in Boston and we've had quite a streak. I don't follow sports at all but we've had quite a streak here in the last 15 years or so. People still go crazy.

Aside: Side note. If you listen to the sports and performance psychology episode, you may remember that one of the worst sports upsets in the history of planet Earth occurred in the year 532, when 30,000 people died after, I don't know, maybe a wonky call in a chariot race – because you can't spell chariot without the word 'riot', which is a thing I just realized when I used the Cmd+F function on the Wikipedia page for Turkey's ancient sports venue, the Hippodrome. By the by, the Hippodrome was also the location for lavish and days-long circumcision ceremonies, to bring it all back to pee-pee machines.

Now, this next fact, by the way, will be one that you share over so many of your distance-Thanksgiving Zoom feasts, and I'm sorry for that. You're welcome.

Alie: When it comes to doing studies on these captive orangutans, you have all of these vials of frozen pee. I forgot to ask, number one, how are they collecting this pee? Do orangutans use toilets?

Lara: They don't, but they are very, very smart, as are all of the great apes. They can easily be trained to pee in a cup just like you would do at the doctor's office.

Alie: Really?!

Lara: Yeah. I can send you a video of that too, if you'd like.

Alie: Yeah! I want to see that.

Lara: Yeah. The zookeeper will hand the orangutan a cup, and the orangutan will pee in the cup. It'll get some juice or some kind of little food reward, and it's very transactional.

Aside: Dr. Durgavich sent me this video on the condition that I didn't distribute it publicly. Yes, an orangutan hanging out in the crook of two branches, calmly takes a Dixie cup from a zookeeper, positions it under her posterior, and passes it back as casually and professionally as someone handing back change at a register. She takes a treat and goes about her orangutany business. She was more graceful at this than I am, but to be fair, no one offers me, like, an empanada to pee somewhere specific, so...

Alie: Unbelievable. So, you have all of these different orangutans and different times of their cycle. Now, this is so interesting to me because I think when we think of captive orangutans, we think higher stress levels, but it's different types of stress. Are they stressed out being in an enclosed environment or are they less stressed because they're not being predated on?

Lara: I don't have the empirical data to answer that question. There certainly have been a lot of studies published on the relationship that captivity has on stress in a whole variety of different animals. There definitely is research that shows that captivity can be stressful for them. The lack of extensive space can be stressful. The lack of options in terms of being able to remove yourself from a given situation, or simply the presence of zoo visitors can be stressful. So, there are a lot of different things that have been shown to be stressful in general, but cortisol is possibly even a more complicated hormone to interpret than testosterone.

Individuality plays a really big role in that, and that was part of what I had originally wanted to look at with my first dissertation research project. As I said, that didn't pan out, but I think that, in general, the kinds of stresses that are going to most strongly affect something like ovarian function, those things are reduced in captivity relative to the wild. That just has to do with having a more consistent and reliable food source, a high-quality food source, and fewer disease or pathogenic challenges. So yes, there definitely is stress in captivity, but like you said, it's a different kind of stress.

Alie: I wonder if it's akin to being in a marriage for money. Like, marrying someone because they've got a lot of money, but you're not super happy, you know what I mean? *[laughs]* It's like, you've got a nice house, you got a nice car, you got good health insurance, but you're kind of trapped.

Lara: Yeah. I don't know. I mean, on the flip side, they don't know anything else. All the orangutans that we're looking at in captivity, they've been born into captivity. It's not like they have this referential frame of the Bornean rainforest that they're thinking back to. At that cognitive level, I don't know that you can necessarily draw that comparison. Although I do kind of like the idea of an orangutan trophy wife. I'm intrigued by this.

Aside: Okay, so the closest thing to *The Real Orangutans of Borneo*, Lara says, is *Orangutan Jungle School* or the Animal Planet show *Meet the Orangutans*. *[clip from Orangutan Island, Narrator: "But Mangis is still traumatized from her clash with Nor, and not even food will persuade her to join the rest of the community."]* All that's missing here is high-end manicures, some white wine, and PMS. Oh, actually, about that last one...

Alie: You said orangutans have a cycle similar to a human. So, what happens? Do they have period panties? What are they doing?

Lara: So, that is an area in which they are different from humans. Humans bleed a lot. We have very heavy menses, [*Bloody hell!*] "*I can't help it if I've got a heavy flow and a wide-set vagina.*" relative to pretty much any other species. [*Alie sighs, exasperated*] Yeah, sucks to be us, and it doesn't go away in quarantine either.

We have really, really vascularized endometrial linings, which basically means that when our uterus builds up this lining to prepare for a possible implantation every month, our body is getting ready and being like, "Okay, if there's a pregnancy, we need to be ready to have the egg burrow into this endometrial lining and get access to mom's nutrient supply and energy" and so forth. Probably because of how large our brains are, we have ended up with this really, really heavily vascularized system.

What that means is that if you don't get pregnant and you have to shed that endometrial lining, there's a lot more blood and tissue loss. The amount of blood loss that a human woman has during the actual menstrual period is going to be significantly more than the amount of blood loss that any of the apes would have when they have their period.

Alie: Wow! And they don't even have to wear pants.

Lara: Yeah, they don't really need the period panties. They are having relatively little blood loss compared to humans.

Alie: They're not out there with a Diva Cup being like, "Where does this even go?!"

Lara: No, they really don't have to worry about it.

Alie: That is really fascinating. I read something that, like, humans have blood loss of something like three tablespoons over a week, or something that *sounds* like nothing.

Aside: Whilst during one's moon bleed, folks lose, as it turns out, six to eight tablespoons of blood, which is around 80ml, or one third of a cup. I'm so sorry to anyone listening to this while cooking and trying to make gravy or something for a holiday meal ten feet away from your in-laws on a freezing porch.

PS: It's not only okay to cancel Thanksgiving this year, it's scientifically and ethically smart and reasonable. If you want to hop on the fam text right now and just let them know it's digital this year, it's for the best. Anyway, on the subject of stress:

Alie: How does stress affect periods in general or affect these hormone cycles? I know people will say, "I'm so stressed out. I missed a period."

Lara: Yeah. It definitely can. Stress can affect what's going on with what's called the hypothalamic pituitary ovarian axis, which is basically the physiological system that controls menstrual cycling. As I say, most people, when they hear stress, if they're thinking about a hormone related distress, that's going to be cortisol. That's not the only thing going on with stress, but it's certainly the most well-known and probably well studied.

Because cortisol has all of these other effects besides stress – cortisol has energetic impacts as well – it can end up interacting with reproductive hormones. You definitely can have situations where psychological stress can impact what's going on with cycling. I personally have not studied that well enough to say how much of that is purely psychological in nature and how much of it is a consequence of if you have increased cortisol because you're more stressed because of life circumstances or whatever that cortisol may be having energetic impacts that are in turn having impact on ovarian function.

Aside: So, while research shows that menstrual schedules don't correlate to increased cortisol, increased cortisol from stress can affect hormones, making periods show up late, or early, or not at all. Can increased stress make people go into early menopause, asked the podcast host, not for the sake or herself but for others of course?

Lara: Not that I know of.

Alie: Okay, just checking.

Lara: Menopause is super conserved as a feature. There's a lot of individual variability in terms of when women hit menopause. One woman might hit menopause at 45 and another woman might not hit menopause until 55, but if you look across populations, there is a very consistent average age at 50 years old. It seems very conserved because what drives menopause is, essentially, running out of eggs.

I mentioned before that women are born with all the eggs they ever have, and eventually that egg reserve gets so low that it starts to affect what's going on hormonally. That drives menopause, and that seems to be something that's pretty true across mammalian species. Most mammals aren't going to reach menopause because they don't live that long, but in mammals that do live long enough, it seems like 50 years is about the shelf-life limit of eggs.

Alie: And is that true for orangutans too? Are they like, "[*angry, grumbling noises*] Leave me alone!"?

Lara: Yes. Yes. [*laughs*] Cranky old orangutans. [*more laughs*] The research that I did suggests that they are capable of having menopause if they do live long enough, but they don't have the same pattern of gradual decline in reproductive hormones that we see in humans. In humans, we start to see drop offs in estrogen and progesterone in women starting around the age of 35, actually, which is why these days if you get pregnant beyond the age of 35 and you go to the OBGYN, they will put a stamp on your folder that says 'advanced maternal age', [*squishy splat*] which is not something you want to hear when you're 35. [*laughs*] I feel for women, but that's actually when hormone levels start declining noticeably.

There's a period starting in your mid-30s all the way up until you hit menopause that is known as perimenopause, and that's sort of this gradual decline of reproductive function, and that does not seem to happen in other ape species. If you look at what's going on with the hormones of chimps or orangutans, it appears that they continue to cycle at fairly consistent rates right up until they're not cycling anymore, if they live long enough. So, humans do seem to be kind of unusual in the rate of reproductive decline that we experience.

Alie: What about PMS? Do orangutans get PMS?

Lara: That would be a great question to ask zookeepers. I don't actually know. That wasn't something that I was looking into at all, so I never asked that question. Now I want to know! I will have to reach out to some zoo colleagues.

Alie: I wonder if they're like, "Janet threw shit at me again. She's about to cycle." [*laughs*] Who knows?

Lara: Yeah, but they might do that anyway.

Alie: I have so many questions from patrons. Can I lightning round you?

Lara: Yeah, absolutely. I'm happy to take as much time as you'd like because I'm on my own right now, which is a rarity these days.

Alie: [*laughs*] Okay, good.

Aside: I wanted to confirm that orangutans get PMS because that's part of my job, and in so doing I stumbled upon the factoid that we don't know what causes PMS in primates. Just a big straight up shrug. But again, we're thinking it's the changes in hormone levels, and since orangutans have periods, albeit lighter ones, it's totally plausible that they get sad, or bitchy, or uncomfortable. Apes: they're just like us! Because they are us. Because we are walking, talking, car-driving, nose-piercing, internet-surfing, space-exploring primates.

So, before we get to a bunch of sexy apes asking our sex ape ologist some questions, each week we make a donation to a cause selected by a sexy ape, and this week, Lara chose the Pan African Sanctuary Alliance. It's an association of wildlife centers in Africa which works to rescue orphaned apes and monkeys, promoting the conservation of wild primates, educating the public, empowering communities, and working to stop the illegal trade in wildlife. To learn more about them, check out PASA.org. There's a link to that in the show notes.

That donation was made possible by sponsors of the show, about whom I shall now yammer for a moment, giving you some handy discounts and helping some baby apes.

[*Ad Break*]

Okay, let's get steamy, primates.

Alie: So many questions from Patrons. I'm going to just lightning round and we're going to see how many we can get to. Some of these, luckily, we covered. Several people, Megan C, Zoltán Szászi, and Anna Vallery wanted to know: Why humans don't have seasonal periods or seasonal mating? Why are we doing this every month? Or orangutans too?

Lara: Yeah. So, there are some primates that are seasonal breeders, but a lot of primates live in either tropical or subtropical climates, which means that there's not going to be a ton of resource variability seasonally. Usually, seasonal breeding is tied more so to resource variability temporally. In our evolutionary history, by virtue of the environments that we have lived in, we took a different pathway and we have ended up with nonseasonal breeding. There are some primates that are seasonal breeders, but it is not the predominant mating pattern in most primates.

Alie: [*fascinatedly*] Ohhhhh. Gosh, okay. That makes so much more sense. George Farrar and Danielle Garrett both had similar questions. Danielle says: When you show up to a party, what is your favorite job-related, jaw-dropping story that you tell a stranger?

Lara: I'll give you my husband's actually, because as the primatology-adjacent individual, he's the one who does more of the like, [*excitedly imitates husband*] "Oh my god, get a load of this!" [*Alie laughs*] Much of the urine that I worked with for my dissertation came from some female orangutans out at the Woodland Park Zoo in Seattle. I went out there at one point to visit. I went behind the scenes, and met the orangutans, and the keepers, and so forth. My husband likes to tell the story that when we were there, at one point, one of the male orangutans very *deliberately* began mating with one of the female orangutans. Just dead staring my husband in the eyes as if to say, like, [*lower distorted pitch*] "This one's mine."

So, my husband really likes to relay that story about how he got 'shut down' by this very large flanged, big cheek pads, impressive male orangutan who was just *not* having his presence in the area.

Alie: He's like, "Don't worry. I'm committed. You're committed. I respect that."

Lara: Yeah, exactly. He was like, "We're all good here."

Alie: Is monogamy typical in orangutans or no?

Lara: No, they're not monogamous. Orangutans are kind of weird when it comes to their mating system because they mate relatively infrequently. [*"It's been a while."*] That's largely because they have a very, very long period of offspring dependence. If you look at the amount of time between when a female orangutan has a baby and the next time she has a baby, which is what's called the 'interbirth interval', orangutans have the longest interbirth interval of any mammal on the planet. On average, a female orangutan is only giving birth once every seven or eight years, so they're not available as mating partners all that often. When they are, females will mate preferentially with the big males.

Orangutans are also weird in that adult males can actually take two different, what are called, morphs or forms. There are what most people think of when they picture an adult male orangutan, which is males that are twice as big as the females, and they have those big old cheek pads, and a really big throat sac for giving out a long call to attract females. They're very virile looking. Then you can also have adult male orangutans that look much more similar to females.

The females will preferentially mate with the big males, but they will mate promiscuously. That may have to do with confusing paternity. [*clip from Maury: "Andrew, you are not the father!" followed by explosive cheers*] It's not a very common mating system because orangutans by nature are semi-solitary. They tend not to hang out with other individuals or in big groups. Matings are kind of opportunistic and are going to be highly dependent on whether there are females around that are cycling.

Alie: Really? Okay. Wow. I didn't realize that they were that solitary.

Lara: Yeah, they are. Back in the day, they were described as solitary. In newer research, the terminology has shifted to semi-solitary because females especially will hang out with other females if there is an abundance of food available. Relative to most primates, they're loners.

Alie: Aww! I had no idea! But I mean, they're so cute.

Lara: I would hang out with them.

Alie: I know! Maybe they're just like, "Let me do my thing. I'm in the jungle..."

Lara: Yeah. They spend most of their time way up high in the treetops and they just do their thing. [*Pee-wee Herman: "I'm a loner, Dottie. A rebel."*]

Alie: There were a few people who asked about different attractions, butts and boobs specifically. Thomas Wyndham wants to know: I always wanted to know, but I've never found any answer that really explains properly, why boobs are so attractive. And someone else whose name I will put in aside...

Aside: Nathan Faulkner, my friend, asked: What's the deal with guys' attraction to butts?

Alie: ... asked why dudes like butts.

Lara: [*laughs*] So, this is funny. Actually, we're rounding out the end of the semester here, and I'm teaching a class right now about the behavioral biology of women. The lecture that I'm going to be giving sometime this coming week is a lecture on fat, breasts, and body image. One of the things I talk about in that lecture is why human women have these permanently enlarged breasts, because in most mammal species you get a little bit of breast tissue enlargement with pregnancy and during lactation, but it doesn't stay that way. Human women have these permanently large boobs.

Aside: Well, not all of us, but yeah okay.

Lara: There are a number of different hypotheses that have been put forth about that. The crowd-pleasing favorite is often the person back in the day, and I don't have the name off the top of my tongue, but someone once suggested that they evolved as flotation devices.

Alie: [*laughs*] Sure.

Aside: Okay, I looked this up, and this, by the by, is the 'aquatic ape hypothesis'. It was laid out by Elaine Morgan. Who's that? Well, not an evolutionary biologist or biological anthropologist, but an author who firmly believes that humans descended from some kind of swamp gorilla buoyed by knockers. It's a sensual, moist hypothesis, but most scientists swipe left on that.

Lara: Mostly the different theories for why breasts evolved have to do with attraction and advertising fertility, or basically having high ovarian hormone levels because breast tissue proliferates as a result of estrogen production. Although most of the difference in boob size between women has less to do with hormones and more to do with just the amount of fat that's in the boobs. The milk producing mechanism is pretty consistent across women, and breast size is really more about how much fat gets deposited.

It is not universal, I should note, that boobs are considered attractive. If you look at anthropological cross-cultural kinds of studies, there are places in which breasts are not sexualized or considered sexual, but in many places they are. There are ideas about a relationship between breast size and underlying hormone levels, and that men have evolved to find larger breasts attractive because they do advertise something about the potential reproductive quality of a given woman.

Alie: Do you think it has anything to do with like, "Oh, this person could survive a winter," or anything?

Lara: Probably not so much with boob size. I would think that that kind of fat storage is going to happen on other parts of the body.

Alie: Oh, okay. Does that include butts?

Lara: It might include butts. I don't know as much about butts as I do about boobs, which is not a sentence that I expected to say today. [*laughs*] Butts are definitely a good place to store fat. Human butts are also weird. There's a lot of weird things about humans. We have big butts. If you look at chimps or orangutans, they have really scrawny little butts. They don't have a lot of fat padding and they don't have the same kind of musculature that we have in our butts. That probably has to do more with bipedal walking and possibly endurance running than it does with fat storage. There definitely is some literature on butts out there if you want to dig into a little more.

Alie: [*mischievously*] Oh, I'll dig into some butts for sure.

Lara: Yeah, there you go.

Aside: Actually, breaking news: as of this week, I have an ologist on deck to do a whole episode on boobs and butts in the near future. Round jigglies, comin' atcha soon.

Alie: There's so many good questions. Okay. Jessica Friz asked: How can eating soy or other estrogenic foods affect our hormones?

Lara: Yeah, it can. It probably doesn't a whole lot unless you're just mainlining tofu all the time. Soy is a kind of estrogen-like compound, so if you ingest a *lot* of soy, it can bind to estrogen

receptors. It's not necessarily actually increasing the amount of estrogen that you have, but it's acting on your body's estrogen receptors in ways that make your body potentially think that you have more estrogen.

There can definitely be effects of diet, and actually we know there are definitely effects of different aspects of nutrition and energy expenditure on ovarian function. With soy specifically, that has to do with the chemical similarity to estrogen as a hormone. Unless you are really consuming an excessive amount of soy, that should not be having a pronounced impact on your hormonal profile.

Alie: Okay. Don't tell the oat milk industry that. *[laughs]* No one drinks soymilk anymore.

Lara: Is that why?

Alie: I think so!

Lara: Wow! Okay. I'm still a cow milk gal.

Alie: It's funny because soymilk was always the alternative milk option. Then I think people started getting worried about the estrogenic effects. So then it was like, "Do you have an almond milk?" And then almonds use too much water, so then people are like, "Do you have an oat milk?"

Lara: *[fascinatedly]* Right. Oh, wow.

Alie: Who knows? They *can* make milk out of cockroaches. That's a topic for another time, but that might be the next alternative milk.

Lara: There you go.

Aside: But what about overall horniness?

Lara: There is certainly variability in sexual behavior. You will definitely find some individuals that seem a lot hornier and are way more interested in mating than other individuals. I don't know whether you can apply the same kinds of terminology of asexuality or anything like that, but you do definitely see variability in behavior at least.

Aside: So, asexual Ologites, you are out there, and you are fine. Some folks asked questions about being trans and hormone replacement like Dan and Catherine.

Alie: We had some questions from listeners about hormone replacement therapy. Ronan, who is a first-time question-asker, says: This topic is extremely relevant to me as a trans man who's two months on testosterone. (Wooo!) How much do mood and other factors play a role in libido versus straight-up hormones? They say, "Before testosterone, my libido was basically to zero, and now it's shot up a lot. I don't think I can put that just on the physical effects of testosterone but also just having reduced dysphoria and just being happier because of a life change." Yeah, how is libido affected by that?

Lara: It goes back to what I was saying earlier about how testosterone has a lot of different effects. Some of it probably is the increase in testosterone levels. There is research from the late 1970s where they gave testosterone to men who had subnormal testosterone levels. They found that, up to a certain level, testosterone actually does promote sexual behavior; the number of erections for example. *["boiiiiinnngggg"]*

But above that level, there doesn't seem to be a continued increase in libido. If somebody has sub-typical testosterone levels, then simply increasing the amount of the hormones may have a measurable effect by itself. There's also going to be an effect on the reduction of dysphoria

and overall mood. I don't think you even need real strong empirical data to support that. Nobody wants to have sex when they're in a bad mood and feeling depressed and all that. That's just regardless of what gender or sexual orientation you are. If you're in a crummy mood and you're feeling shitty, you don't want to have sex.

My guess is that, in this person's case, the testosterone actually did or may have had an effect, but that would certainly be compounded and probably magnified by the change in psychological status.

Alie: Yeah. Oh, for sure. I think it's interesting Catherine Gilbert, a listener, also said: My husband is a trans man and we noticed that since he started to get testosterone, he cries less, but gets angry more often.

Aside: So yes, we did the neuroendocrinology episode around the same time and that is a two-parter. I'll link that in the show notes. It covers a lot of these questions.

Lara: There's some evidence that suggests that increased testosterone is associated with more aggression, but there's also some evidence that shows that people who increase the amount of aggression end up with higher testosterone levels.

Alie: Okay. That's interesting. A ton of people wanted to know about birth control and libido. Nanxi Y, Christine Clements, Imogen Armstrong, Ashley, Ashley E, Chelsey Kraft, Madeline Anderson, Annie C, and Anna Vallery all want to know essentially: Why does birth control or other medications kill libido? And then Annie C says: Absolutely this. It seems like someone thought it would be funny if birth control made you not want to have sex at all.

Lara: *[laughs]* Well, I guess that's doing double duty. That's a really good question. From the straight hormonal perspective, it's a little bit of a tricky one to answer because what birth control pills are doing is artificially modulating your progesterone and estrogen levels either to prevent ovulation from taking place or to prevent implantation from taking place, depending on the kind of birth control that you're using.

The research about the relationship between those ovarian hormones and libido isn't entirely clear cut. When it comes to both males and females, the clearest relationship that's been found about hormones and behavior, libido in particular, is testosterone for both men and women. So, I don't have a good explanation necessarily for why a medication that alters ovarian hormones has, in so many cases, such a measurable effect on sexual motivation.

Aside: Oh, and sidenote: the medical community is still debating this. STILL. But many researchers think that taking hormones can alter the way your body produces other hormones, and many combined birth control pills have estrogen and progestin, which may lower testosterone in some people who are trying to get their ovaries to just please not with the eggs. Question: can the sperm cannons take the pills instead? It's 2020. A lot of you are just sick of this shit.

Alie: On that note, two people, Olaf Doschke and Dianne P, both asked about boy birth control. Olaf says: I have repeatedly heard about a "breakthrough" on hormonal contraception for men. What is hindering the final success?

Lara: So, a lot of that is cultural in nature.

Alie: Whoa!

Lara: Yeah. Men don't want birth control for men.

Alie: Oh my god.

Lara: There have been a couple different avenues that people have tried in terms of ways to create male birth control. There is actually a gene called the CatSper gene that's been identified that affects the motility of sperm. I don't know where the, kind of, standing of this is right now in terms of whether it's still being pursued, or in clinical trials, or anything like that. I know that there was some talk at one point, some kind of genetic modification that they could do to, kind of, disable sperm. [*"You're not going anywhere."*] But more often than not, male discussions of male birth control, that's going to involve reducing testosterone in some fashion because testosterone is what drives sperm production.

Oftentimes there is large resistance to that from men because they are very attached to their testosterone. It is somewhat complicated, as I said, because testosterone does have all of these additional functions besides sperm production. But I think honestly the biggest barrier to male birth control is men and male attitudes. A few years ago there was a headline that I saw about some kind of a trial that was being done with some form of male birth control and they discontinued the trial early because the men were complaining of all different kinds of mood symptoms and, you know, basically stuff that women deal with *all the time*.

Alie: All the time!

Lara: But the men were like, "Nope, not doing it." So they just stopped.

Alie: I mean, there are certain birth controls that can make... the things that we put up with, on birth control.

Lara: Mmhmm!

Aside: Also, if you find that progesterone effs with your moods, you are not alone. I have to take a cocktail of different hormones since my ovaries just set sail and retired 15 years early (bye now!). And I didn't realize for the first year that the progesterone I was taking made me want to melt into the earth and be eaten by fungus. I was miserable. So ask your doctor about that, because for some of us it can suck gonads in the bad way.

Dr. Durgavich also says that most people on birth control aren't told that the placebo week is totally unnecessary. It was invented by a scientist, John Rock, who was horny for the Pope's approval so he was like, "Let's make these women have periods so it's like the rhythm method," though not at all. The Pope was like, "I see through you! Excuse me, no, this is still a sin." So John Rock stopped being Catholic, but for decades literally billions of humans have cramped and bled for no reason. For a beef between the Pope and John Rock!

Lara says Western women spend way more time cycling than is typical for women in more traditional foraging populations or would have been typical in our evolutionary history, which not only wastes a lot of crotch cotton but has other ramifications, not to mention all the sets of sheets in the garbage.

Lara: That's actually really significant because the fact that we have so many more menstrual cycles across our reproductive lifespan increases the risk for things like breast cancer, and ovarian cancer, and different kinds of reproductive cancers.

Alie: So are you better off doing, like, Seasonale, or just skipping that?

Lara: You actually might be. There's a population of hunter gatherers called the !Kung who live in Botswana in Southern Africa, and they've been the subject of a lot of anthropological research over the years. When you look at the reproductive life history characteristics of, say, a !Kung woman versus an American woman, a !Kung woman might have 150 menstrual cycles across her lifetime.

Women in that population tend to not start menstruating until slightly later age. They get pregnant generally at a slightly earlier age, and then they have more pregnancies and longer periods of lactation. Generally when you're lactating, at least for the first six months or so, you're not ovulating, and so you're not menstruating. Across their lifespan, they're having maybe 150 menstrual cycles. An American woman is probably having more like 450.

Alie: [*gasping in shock*]

Lara: Yeah. It's like a 3x magnification, and because that exposes our bodies to so much more hormone over time, that actually does impact our health long term.

Alie: Four hundred is *so many*.

Lara: 400–450, yeah, it's a lot of cycles. Way too many.

Alie: So many chin zits that we don't need to get.

Lara: [*laughing*] Exactly.

Alie: Acne is hormonally related as well, right?

Lara: Yeah.

Alie: Okay. Mowana Lomaomvaya – hope I said that right...

Lara: Ooh! Great name!

Alie: I know, right? – wanted to know about mating relationships and why are they so different in humans and primates? They say: So. Many. Questions. And they're an anthropologist. Jam Cruz wants to know: What's the most elaborate mating ritual and the ape world? So, mating rituals? Hormones?

Lara: I wouldn't necessarily say that there are any mating rituals in most nonhuman primates. There are definitely some species that have way more diverse sexual behaviors than other species. I mentioned before that orangutans, when they *do* have matings – which are relatively rare – they tend to go on for a pretty long period of time. So you can have a sexual encounter between a male and female orangutan go on for 30 or 60 minutes. [*Well, why don't we take a five-minute break?*] When you compare that to the average chimpanzee sexual encounter, which is, I think, seven seconds, [*Alie bursts into giggles*] you definitely get a difference there. Chimpanzees are wham, bam, thank-you ma'am. There is no foreplay, there is no snuggling. It is very efficient.

Alie: That's one way to put it.

Lara: Yeah. Orangutans will have particularly prolonged mating encounters. Bonobos, you may or may not know, have an incredibly diverse array of sexual behaviors. Basically everybody is having sex with everybody else all the time, whether it's for mating purposes or not. With bonobos, you can get, what is called GG-rubbing among females, where they have those pronounced sexual swellings during their window around ovulation, and they'll rub those together for pleasure. Males will actually engage in a behavior sometimes called penis fencing. [*En garde!*] So, that's a thing. There is a lot of diversity in sexual behavior, but I wouldn't say that any nonhuman primates that I know of have mating rituals.

Alie: Will Plewa wants to know: Do they have biological clocks?

Lara: In the sense of like, "I gotta have kids"? I would say that I don't think I'd phrase it as them having a biological clock, but generally what you find is that females reach reproductive maturity... There's often a period of what's called adolescent subfecundity, which basically

means that they have started cycling, but they're not having fully mature reproductive cycles yet. Maybe they're having cycles where they are seeing endometrial development. And so they'll have menstrual bleeding, but there wasn't actually ovulation that cycle, or maybe the quality of the endometrial lining is lower and so there's no implantation. There can be a period where they kind of are reproductively active and not getting pregnant that may be driven by continued hormonal maturation. But once they reach full maturity, they tend to get pregnant pretty quickly. So I don't know that I would call it a biological clock, but they tend not to waste time.

Alie: Some great questions from Laura Stacey, Aarika, and Megan Walker. Aarika says: Do nonhuman primates get angry, sad, snacky or sleepy as part of their reproductive cycle? And Megan asks: What advantage could there possibly be to becoming emotionally unhinged during various days of the menstrual cycle?

Lara: *[laughing exuberantly]* So I'll start with the nonhuman primates one. Do they get emotional, snacky or angry? That's another one where I don't think we have that data from wild animals. I think a zookeeper would probably be the best person to ask for the captive animals here. I mean, in terms of the underlying hormones, what's going on is the same. And so if there is a relationship between that hormonal fluctuation and the kind of mood swings that human women often report, or you know, changes in appetite, then the hormonal underpinnings are the same.

Theoretically they should be exposed to that same fluctuation, but I don't know that anyone has actually looked at whether there is an equivalent behavioral change in any nonhuman primates. I believe that anybody who has looked has concluded that there's no evidence of a PMS-like syndrome in any nonhuman primates, but in terms of specific behavioral changes having to do with appetite or mood, I don't know of any research on it.

Alie: A few people asked about pheromones Bee Wilson wanted to know: What is up with pheromone candles and lube? And Carolyn Armitage and Nicholas Visser-Johnson wanted to know also: How do we detect pheromones? What's up with that?

Lara: To the best of my understanding, humans actually aren't using a lot of pheromonal communication. If you look at rodents and you look at other kinds of species, there may be more pheromone communication going on. Most human mating behavior is probably not strongly affected by pheromones. So if you've got, like, pheromone candles or something like that, I would doubt the veracity of any claims that those might make.

Alie: Other than placebo, I'm sure.

Lara: Yeah, which is a real thing. Placebo effect is totally a real thing, so from that sense, go for it, but from the empirical sense of any claims having to do with pheromones, I would be doubtful.

Alie: First-time question-asker Eva Haisova – last Patreon question – wants to know: Why am I so horny all the time?? And I think they're talking about themselves and not me.

Lara: Not why Alie is horny? *[laughs]* Wow. I don't know how to answer that question. Does this person give an age, perhaps?

Alie: Nope! That's all the details we have. Does your estrogen make you hornier? Does testosterone? Do they both?

Lara: As I was saying before, testosterone is the hormone that has the best evidence for a relationship to libido. And that's true in both men and women. That said, despite the fact that

I did not actually find a lot of supporting evidence for a relationship between either estrogen or progesterone and mating motivation in the female orangutans that I looked at for my dissertation – and again, I haven't looked at this in humans, I've only looked at it in orangutans – I would not be surprised if at some point we discovered that there is some kind of mechanistic interaction between some of these different hormones that does measurably impact mating behavior.

Is it simply how high is your testosterone? Is it, how high is your estrogen, how high is your progesterone, or does it have to do with what are the ratios of those different hormones? Again, I'm not a biochemist, so I hesitate to theorize too much on that, but the short answer that I can give right now is that we don't yet have good evidence that estrogen is having a strong impact or that progesterone is having a strong impact on mating motivation. Testosterone, more so. But why an individual is so horny all of the time might have less to do with the underlying hormones and more to do with other things in the environment or other kinds of personality factors.

Alie: Maybe it's quarantine.

Lara: It could be! I'm actually really interested to see, down the line, whether there's a baby bump as a result of this, or whether everybody, as I was saying before, is in such a bad mood all the time that nobody's having sex.

Alie: I know I said that was our last Patreon question...

Lara: No, go ahead.

Alie: Kathy Ho and Kerri -Leigh wanted to know if it's possible to become less horny for a person over time. Like, is there a mental block that makes you feel like, [*half-hearted*] "eh"? Or is that part of a role of pair bonding? And I wonder if that's happening to couples who are together too much.

Lara: No, it totally is. There's actually something called the Coolidge effect that you should look up if you're not familiar with it.

Aside: Essentially, novel mates – or videos of them, say – spike dopamine, which means that not-novel mates might not have the same stimulating effect.

Lara: Reduced motivation to mate with the same individual over time. And the reason it's called the Coolidge effect, if I'm not mistaken, has to do with Calvin Coolidge and something about his marriage and possible deviations from marriage.

Alie: Really?

Aside: I looked this up, and yes, it's from an old anecdote about Mrs. Coolidge seeing a rooster just boning non-stop in the hen pen and telling the farmers, "Hey, mention this to Mr. Coolidge." The farmer later did and the president asked, "Was it the same hen? Or different hens?" and the farmer was like, "No sir, many, many different hens," and then Coolidge said, "Well, tell *that* to the First Lady."

So, when scientists observed animals that were exhausted from getting it on, but suddenly were alert and randy when a new partner entered the scene, they were like, "We have *just* the Presidential homage for that." The Coolidge effect.

Lara: That absolutely is a phenomenon that occurs. People talk about the honeymoon period and stuff like that, that's a real thing, that people's attraction can wane over time to the same individual.

Alie: Well maybe we can hack that if we just buy some cheap wigs on Amazon.

Lara: I think there are ways to hack that. Again, this gets more into the realm of, kind of, psychology and relationship counseling than my area of expertise. But I think that probably if you do a little internet digging, you will be able to find people discussing the phenomenon and suggesting ways to try to ameliorate it.

Aside: Prosthetic butts, anyone?

Lara: You go and you buy the plastic sexual swelling that they used on the macaque and then you surprise your partner. And that's a fun Friday night for everyone.

Alie: Just get it delivered! You know I always ask this, but what's the worst thing about your job, the worst thing about doing the research or the most frustrating thing about it?

Lara: The most frustrating thing for me, both while I was doing my research and continuing today – and I think it's partially related to the adjunct lifestyle I've chosen – is the ongoing struggle with imposter syndrome. Especially because the work that I did for my dissertation was entirely lab-based, I didn't go out and do any behavioral observation in the wild, I was working exclusively with the hormones, and spreadsheets, and numbers, I constantly struggled with feeling like I wasn't qualified or doing it right, or I second guessed myself a lot.

I think that by virtue of the fact that I now have this itinerant lifestyle where I kind of go where teaching opportunities are available but have no stable employment from year to year guaranteed, I still continue to struggle with that imposter syndrome. So I think that's really tough. I know it's not unique to me, but I think that that's one of the hardest or suckiest things about where I've ended up.

Alie: And *so* common.

Lara: I mean, it's super common. I'm not unique by any stretch.

Alie: But that should just let you know, hopefully, that that is a signal not to listen to it.

Lara: Yes. I try to suppress it.

Alie: Although I will say that I don't know that men have imposter syndrome as much, and I can only say that from watching my boyfriend try to bake bread. He just decided not to measure anything. He was like, "Oh, I'll wing it." I was like, "That is literally the opposite of imposter syndrome."

Lara: I can actually tie that back to hormones.

Alie: Can you really?

Lara: There are data that show, or that *seem* to indicate that because men have higher circulating testosterone than women do, and because testosterone is associated with positive affect, that men are more likely to think that they are overqualified for something, and women are more likely to think that they are underqualified.

Alie: Oh my god. So, do not listen to your ovaries telling you that you...

Lara: No, no. You've got to ignore your ovaries.

Alie: What about your favorite thing about what you study or what you do?

Lara: I love teaching, honestly. I really enjoy interacting with students. I really enjoy trying to come up with novel ways to connect with them and let them explore material in nontraditional ways. In some of my classes that I teach I've started using an assignment called an un-essay.

As a final project instead of writing a traditional research paper I give the students an opportunity to figure out a way to do something with the material that's more meaningful to them personally. That has resulted in some amazingly creative and awesome projects that students have done, including... actually last semester when I was teaching an introductory Bio Anthro class, I got several podcasts that people did themselves. But like paintings and games and all different kinds of stuff. So, I love that kind of thing.

This semester I actually took advantage of the 3D printer before the world shut down. I took advantage of the 3D printer at the university and found a file to 3D print clitorises. When I was teaching about the clitoris, I was able to have some 3D models that I could pass around and blow people's minds by what the clitoris actually looks like, and how big it is, and how awesome it is. I really like being in the classroom. I really like getting students excited about the material as much as I can.

Alie: Oh, that's amazing. Orangutans have clits, right?

Lara: Yeah.

Alie: I figured. I thought... I mean, of course they would.

Lara: No, they do. They probably don't think about them as much as we do, but they have them.

Alie: Well, as much as *some* humans think of them. Some humans don't think of them. *[laughs]*

Lara: That's probably true.

So ask smart people, shameless questions because the answers have been within your gonads the entire time. You can follow Dr. Durgavich on Twitter [@TinkeringPrim8](#). There's a link to that in the show notes. I'm going to have more links, like to the organization we donated to and to Lara's huge TED Talk up at [AlieWard.com/Ologies/BiologicalAnthropology](#). We are @Ologies on [Twitter](#) and [Instagram](#) and I'm [@AlieWard](#) on [both](#). We just crossed over 100,000 followers on Instagram, and I just dig you all for being on this nerdy journey with me. It's just surreal, it's amazing.

Ologies merch is available on my website and via a link in the show notes. We have winter hats and masks now. Thank you Shannon Feltus and Boni Dutch of the comedy podcast *You Are That* for managing that. You can become a Patron of *Ologies* and submit questions for \$1 a month at [Patreon.com/Ologies](#), come join the club. There is a [Facebook group](#) moderated by Erin Talbert. Thank you, Erin. Emily White leads a transcription team; I love them very much. Transcripts are available for free via a link in the show notes, they're on my [website](#). Bleeped episodes for kiddos are also available, thank-you Caleb Patton for bleeping them.

Noel Dilworth does all the interview scheduling, and assistant editing was done by master baker Jarrett Sleeper, who is wonderful. Thanks very much to lead primate editor Steven Ray Morris who hosts the *Purrrrcast* as well as *See Jurassic Right*, two podcasts about kitties and dinosaurs. Nick Thorburn wrote and performed the theme music for *Ologies* and is in a very good band called Islands.

And if you stick around 'til the end of the episode, I spill some beans for you to emotionally mop up during the closing theme song and this week is that I skipped sex education in 5th grade because I was too nervous, and I pretended that I had a stomach ache and I stayed in the nurse's office all day, and so I didn't know what a boner was until 7th grade in science class. And I was like "WHAT?! It changes??" A day I'll never forget.

All right, apes, be good to each other. Next week, a very, very important episode I feel like you will listen to over, and over, and over again. Ah. Next week! Get ready. And honestly, cancel Thanksgiving. Cancel Thanksgiving. It's okay. Do it on Zoom, more people will be alive next year for Thanksgiving if you do that. It's okay. You can tell your relatives I said it was okay. Okay, you're the best. Berbye!

Transcribed by:

Madison Campbell

Scott Metzinger

Isabel Burns

Your primate pal up North, eh, and her feline pal: Aska Djikia and Lenjamin

Edits by Kaydee Coast

More links you may enjoy:

A donation went to PASA.org

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