Episode 95: Why are we like this? (with Tina Lasisi)

SPEAKERS

Tina Lasisi, Art Woods, Marty Martin

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MM: So Art, what's your favorite Seinfeld scene?

AW: The ketchup squirt as Jerry is describing his hot date to George in Monk's.

MM: Yeah, that was a good one, but one of my favorites is the one where George gets a toupee….George, in typical George style, walks into Jerry's appointment, upset about a recent date that Kramer set up for him.

AW: Oh yeah, now I remember this one…George is mad because the woman Kramer set him up with was bald, which is crazy because George is ALSO bald AND he has started wearing a toupee!

MM: Yes! But the best part is Elaine's response to George's ridiculousness about the date…she says, 'don't you see the irony here? You're rejecting somebody because they're bald.'

AW: and George says…'so'?

MM: And Elaine explodes, getting in his face with a flourish and yelling 'You're bald'!

AW: Ha, yeah and then, George makes the stupid mistake to provoke Elaine further, saying, 'No I'm not… I was bald'!

AW: Elaine then rips the toupee off George's head and chucks it out the window screaming…

'I don't like this thing and here's what I'm doing with it!'

AW: Ahhh Seinfeld…

MM: Yes, the best sitcom of all time to me, but I do have a reason for bringing it up today.

AW: We're talking about personality disorders based on the characters?

MM: Hmmm, we could, couldn't we…but nope, today we're talking about not-baldness…or hair, specifically the reasons hair takes so many colors and shapes and textures among and within species.

AW: Our guest today is Tina Lasisi, biological anthropologist and recent postdoc at the University of Southern California…And as of Fall 2023, an Assistant Professor of Anthropology at the University of Michigan.

MM: You might know Tina already from her recent collaboration with PBS called, 'Why Am I Like This'. On that show, Tina covers challenging topics in human biology in a super-approachable way, largely intended for a younger audience. Check it out!

AW: Tina is both an amazing science communicator and an insightful and broad-thinking scientist.

MM: Although we didn't spend much time with her discussing baldness, we did cover why mammals are so diverse in the parts of their body that are covered with hair…

AW: But we spent most of our time talking about why human hair varies in color and texture at all, mechanistically but also evolutionary.

MM: We also talked about what hair variation, and human skin color variation, means with respect to race.

MM: As you'll hear, patterns of skin and hair traits among groups of people arise through many different pathways, some that may be adaptive.

AW: Like selection for Vitamin D synthesis or against folate breakdown.

MM: However, most variation probably persists for accidental reasons, based on movements of different groups of people in different historical periods.

AW: In this light, hair and skin,

MM: What Tina calls 'racialized traits',

AW: Can relate to race, but they might just as well be misleading,

MM: Especially because race is far more complex biologically than history would suggest.

AW: She thinks we have to confront head on -quote- 'the depth and complexity' of human variation.

MM: She argues that ancestry is just one dimension of human variation, and that ancestry itself includes genetic and environmental factors.

AW: Differences are not necessarily negative or even positive; they can be neutral.

MM: But they are there, and Tina feels,

AW: And we agree,

MM: That casting race as a wholly social construct misrepresents the data.

MM: I'm Marty Martin,

AW: And I'm Art Woods,

MM: And this is Big Biology.

[Music break]

Marty Martin 00:00

Tina, thank you so much for joining us on Big Biology today. We're really excited to have you here, and to talk about human variation, but in particular hair, even though some of us maybe these co hosts lack it. Let's start with the basics. Why do some of us have hair at all? And why aren't we hairy all over, like most mammals?

Tina Lasisi 00:20

So when it comes to our species, in general, as we're developing into adulthood, we end up growing a full head of hair at one point or another, may lose it at some point. And it's a pretty distinctive thing among humans, because usually, we think of ourselves as naked apes. So compared to apes and other non human primates, we don't have hair on our bodies. But what I always like to draw attention to is the fact that there are other naked mammals like you have cetaceans you have, you know, I mean, depending on how you look at elephants, pretty much naked, naked mole rats very much in the name, but we're the only weirdos that have hair on top of our heads while having naked bodies. So it's a little bit of an evolutionary mystery, and one that you would have thought we would have given more attention given how unique it is to humans. And so in brief over the decade that I have been working on this question, the answer seems to be that once we became bipedal, and once we started losing our body hair in relation to thermo regulatory development, so like to better sweat and lose heat in the equatorial climate that our ancestors evolved in, we also we're in a situation where the closest part of our body that is to the Sun is our head, which also houses our brain, which is notoriously thermosensitive, and also thermogenic. And so it is likely that one of the reasons we were able to evolve big brains is because we were able to evolve scalp hair. So if you look at other mammals, one of the reasons that mammals have hair is not just to insulate them and retain heat, but it's also to minimize how much heat they get from solar radiation. That's a function that hair also has. So that's the abbreviated version.

Art Woods 02:04

Super cool. Okay.

Marty Martin 02:06

And go ahead.

Art Woods 02:07

I was gonna say, I think if you'd asked me that question, I'm total non expert here, I would have come up with something about sexual selection. So the roles that that hair on around the face play and in sexual selection, so is there any evidence for that?

Tina Lasisi 02:19

So anyone who knows me knows that do not get me started about sexual selection.

Art Woods 02:25

So it's too late. We went there.

Tina Lasisi 02:26

Too late, you already went there, we're gonna have to go there. The thing about sexual selection is that the models that people have of sexual selection usually apply to species that have very different mating patterns from us. And they have mating patterns where you can have a lot of variability in how much offspring an individual has especially like, between the sexes, when it comes to humans, like in terms of mate selection, type sexual selection, it's really difficult to do that, because in general, humans don't have that much offspring. And they tend to pair you know, with others, but you can, you don't have that much variability compared to some of these other species. So when it comes to sexual selection, as well, usually people talk about attraction. Attraction is a notoriously difficult thing to quantify. But it's also something that very easily changes with different cultural contexts and over time. So if we take eyebrows, for example, I know what you guys are thinking: What, eyebrows? But as a millennial woman, I am very aware that in the early 2000s, it was really attractive to have pencil thin eyebrows, like you know, you want the thinnest eyebrows that you can have. And so a lot of people shaved them off, tattooed them on all of that stuff, and it was considered attractive. Now, fast forward, 20 years later, we want big, bushy eyebrows. It's a matter of 20 years, most of us who were around 20 years ago are still alive and regretting the decisions that we made with our eyebrows. Now, imagine, if you're trying to use that kind of, I guess, erratic desire for aesthetics to shape natural selection in humans, it will be really difficult. So that is one of the reasons where it just in general, I want to preface that sexual selection is very difficult to test. And then the second part of that is, of course, it's really difficult to have consistent sexual selection in a particular direction. So when you put all of those things together, it just doesn't seem likely that it would have been able to shape something as dramatic as this and that it would have been consistent for all humans.

Marty Martin 04:32

Wow. That's really I don't think I've ever heard the argument that like there's a cognitive because we are cognitively sophisticated. Like there's a possibility that can balance any other sorts of things that are there going on it can it can wash it out. I mean, that's not exactly what you're saying. But there's that dimension that wouldn't come into play in a lot of other systems.

Art Woods 04:49

The tastes and preferences would fluctuate a lot.

Marty Martin 04:51

Yeah, exactly. Right. I mean, it just comes up to whatever the winds are, that's gonna that's going to drive the system.

Art Woods 04:56

Why isn't there a fossil record for hair that can be exploited?

Tina Lasisi 04:59

Why is there not a fossil record for hair? Well, that's because hair degrades. And most conditions, it can't actually stay for long at all, like, you know, we're talking about like after, you know, a couple decades, depending on what the conditions are. And this is really a forensics question because like you can lose hair in certain conditions, probably like, you know, within months, but the oldest hairs that I've heard of have been mummified hair. So then you're talking about a couple 1000 years. And Ötzi, he's an ice mummy. Also hair. So if you're only going back, like 1000 years, a couple 1000 years, you don't have enough time depth to really understand the number of generations over which natural selection occurs. And that's really the question that I'm interested in how did natural selection or even just population neutral genetic drift change what we see in terms of hair traits across different humans? And you know, looking at early human ancestors as well?

Art Woods 05:52

Yeah, I'm just thinking of like bird feather fossils, right. So there are decent feather fossils. And you would just think that there would be, I don't know, early mammals would have fallen down and the hair would be would be fossilized? And we'd have some knowledge of them.

Tina Lasisi 06:05

You know, that's a great question. Like, I would have to actually look it up, because I do know that there are some fossilized feathers. But I wonder if it's the same structures, right? Because hair, and feathers, and nails are all made of keratin. But there's obviously differences in that keratin. So I think that that's probably what it has to do with. And in some cases, I'm not even sure it might be an imprint of that feather that's been fossilized that I've seen. But I would have to look it up in terms of like hair I've never heard of actually fossilized hair.

Marty Martin 06:38

All right. So how then do we understand, Art and I don't have hair up here. But we do have hair here. And that's a more male than female kind of characteristic in humans. How do we understand that pattern?

Art Woods 06:50

He's gesturing to our faces, by the way, just to be clear.

Marty Martin 06:54

Yeah, so why then do males and females tend to be different with respect to facial hair? If it's not sexual selection?

Tina Lasisi 07:01

That is a great question. I'll answer this in two parts. So first, the answer is hormones, sex hormones in general, obviously, none of us are surprised. That makes sense. So like the proximate question of how does it work, and if you look across human development, so from, you know, being an infant to being like a full grown adult, that is, I think, the best dimension to observe sex and for me, like traits affected by sex, it's one thing to look at males versus females. Yes. And you have some differences, average mean differences. But what's really interesting is being able to look at it from like this evo devo perspective of like what happens over time, when various structures are interacting with each other in different biological pathways? How do you get like these different phenotypes. And so we know that over puberty, that is when we start seeing these so called secondary sexual characteristics where you have this interaction between hormone receptors and hormones, and it can generate these new phenotypes for that organism. So that is really what's happening. We're talking about sexual dimorphism in humans. Now, the ultimate question of why is there sexual dimorphism? I think is a wonderful question, right? And if it's not sexual selection, like what could it be? And if you're thinking about sexual selection, broadly, not necessarily attractiveness, but thinking about different selective pressures on different sexes? You know, there might be some sense to that. But the secondary point that I would bring into this is the Spandrels of San Marco,

like, I'm sure I'm not the first person to bring it up. I am a huge fan. I'm sure that adaptationists everywhere are crying.

Marty Martin 08:38

Oh boy, Art and I have talked about this so many times. We love, we have very different opinions about that paper. Let's put it that way.

Art Woods 08:47

Don't get it started.

Tina Lasisi 08:48

Oh, well, it's we're gonna have to get it started, y'all.

Art Woods 08:50

Let's go.

Tina Lasisi 08:51

So for me, I always bring it up to people to make folks think critically about what is possible in evolution. This is not you know, Sims 14, where we can just tweak with knobs every single aspect of our appearance, right? All these biological structures are integrated and related in complex ways. And depending on where you're messing with something in development, you might change more or less of the whole body. And when it comes to sexual dimorphism and sexual differences, I think that it is really plausible to think that anything that would have changed body wide you know, sex hormones, or receptor distribution in general could have affected these things. So if we think about body hair, for example, facial hair I give you that might be more difficult to explain. But if you think about body hair, if you think about underarm hair, groin hair, all of these regions have a lot of apocrine sweat glands, as well as eccrine sweat glands. So apocrine sweat glands are the ones that produce basically the more oily sweat that also has more sex hormones coming out of it. You can't necessarily say oh, like it was hair that is being selected for, maybe as we were able to evolve hair, that is just how it interacted with that region of the body, and therefore you end up getting that distribution. And in terms of distributions, I think it's really interesting to look more broadly like outside of humans, is there something about this region of the body that is different? And we know that the face and the head like there's stuff going on there in terms of developmental patterning. Because if you look at some really cool monkeys, they have mustaches, they have beards. It's just so cute. A monkey with a mustache. I love it. And so it seems that, you know, there's some some kind of phylogenetic

inertia, I guess I would call it where there is a patterning already there, where we're going to be super imposing these new traits that we've evolved.

Marty Martin 10:55

Yeah, wow, what a beautiful explanation. I mean, when you said Spandrels of San Marco, I expected exaptation. But then what you said was just a really neat, you know, this might be important, but this might be at least something just comes out of the complexity that it is to have hair anywhere for different functions. That's super refreshing. That's a really nice take on on complex traits. I don't know how Art thinks he loves the concept of exaptation so much that I'm not sure what his take is. But that's that's a really cool explaining.

Art Woods 11:22

Yeah, I don't know. I think I think exaptation as an idea maybe is sort of too orthogonal to this thing that we're just talking about. I'm fully on board with you just said it sounds sounds great.

Tina Lasisi 11:31

Wow, I can't believe I resolved this somebody put me up in the UN because I'm about to give us world peace.

Art Woods 11:44

So it feels like what we're talking about right now is sex related differences in the hair, and also maybe sort of phylogenetic differences among different species, but maybe let's narrow in just to humans, and talk about sort of spatial variation across the world in sort of hair morphology and hair types. So maybe just give us an overview of like, what's the scope of variation in terms of color and texture rates of growth, that kind of thing.

Tina Lasisi 12:09

Okay, so if we just think about scalp hair, the range of variation that we see in terms of scalp hair, morphologically is anything from a completely straight hair fiber, which can be very thick, or it can be very thin, to a tightly coiled hair fiber. So the distribution of that variation is basically across the continent of Africa, you have different levels of curled hair, so like it can go anywhere from super tightly coiled, which really, what does that mean of like, if you think about the diameter of that curl, like, I guess on the order of two millimeters, like one millimeter, I've seen even that kind of diameter of the curl, to much bigger curls, 10 centimeters, maybe. And then outside of the continent of Africa, if we're going into East Asia, like towards East Asia, you have especially thicker hair fibers is something that you notice. So all the way in East Asia among Han

Chinese people, there have been some genetic studies that have shown that there's been selection for thicker hair fibers. Now, whether it's thicker and straighter hair fibers, we're not sure but you have thicker hair fibers. You also have straighter hair, and then going into the Americas. You also see like straight, thick hair fibers, some of the thickest hair fibers I've ever seen, you know, looking at some museum collections. And if you look at Papua New Guinea, going into Australasia, you again see really tightly coiled hair. So in some Southeast Asian populations, small Southeast Asian populations, I've never seen the hairs themselves. But I've seen pictures of those people, you also see tightly coiled hair, and then going into Australia, indigenous people in Australia have kind of I guess what you would just call like wavy hair. It's like a bigger loop of that curl. So going to Europe, you have thinner hair fibers, and you have a range. So in terms of the distribution within most populations, you can see some individuals that have tightly curl or relatively tightly curled hair. And you can see individuals who have pin straight hair. So that is very much glossing over things. Because you know how it is like within a population there's variation. And in terms of color, what we see is that most populations in the world have what we see as homogenously dark hair, so whether you want to call it black or dark brown, it's mostly got this eumelanin which is like this brown black pigment, and it's got a lot of it then going into Europe and some of Melanesia so, Solomon Islands, there are large numbers of individuals who have very lightly pigmented hair that some would call blonde. and in Europe again, you also have individuals with red hair. I am a big fan of red hair. Did my masters paper on red hair. Pheomelanin, shout out. Love that. So I would say that that's really the cliffnotes if I haven't forgotten anyone.

Marty Martin 15:19

Yeah, well, we did ask you, Hey, summarize the pattern across the entire planet.

Art Woods 15:24

The world. And beyond.

Marty Martin 15:25

That was a big jump. So I want to narrow it down and wrap it back to the adaptation perspective, you know, in general, for for hair and patterning of hair. What's the most variable? I mean? So where does the variation among populations tend to reside? Is it in the thickness? Is it in the curliness? Is it in the color? And can you then map that variation to the stories that we have about how hair is an adaptation? Does it? Does it sort of work well, within and among populations?

Tina Lasisi 15:52

That is a great question. And what I would say to that is our idea currently, of hair as an adaptation doesn't necessarily explain differences between modern populations, right? So if you can imagine it's kind of like thinking, okay, the last common ancestor had this trait. And that's why, you know, we all started off from that phenotype, and went elsewhere, it wouldn't necessarily be easy to look at modern populations, and map the variation of environment onto that trait. So with that in mind, what I would say is, if tightly coiled hair minimizes the heat gain from solar radiation, it makes sense that the last common ancestor who would have been in Africa would have had tightly coiled hair, and we all would have started out from that phenotype. Now, if we look at other places that have high solar radiation, you don't necessarily see that so going outside of Africa, looking at different places across you know, South Asia, Southeast Asia, you kind of see different phenotypes. Papua New Guinea would be like the main exception that I always point to where it's like, look at this non African population that also has tightly coiled hair. But outside of Africa, you don't really see other than Melanesians, and a couple of those Southeast Asian populations, tightly coiled hair on the order of you know, what is possible. And that is one of the reasons that makes us think like, okay, it may not have been a point of selection over the last 60,000, 100,000 years. And it could be that after a certain point, when humans were able to behaviorally adapt to various things, they weren't at the mercy of whatever phenotype they had. Now, the exception to that seems to be the evolution of thicker hair fibers in East Asia. And again, like I said before, can't necessarily always distinguish thickness from straightness. And that's in part because of the physics of a rod like if you have a thicker rod, it will necessarily be straighter, because it's harder to bend. So assuming that we're looking at thickness, specifically, one could say like, oh, maybe something about their ancestral climate was cold, a thicker hair fiber would have been beneficial. But that's where evo devo comes to mess with you again. And that's because hair is developmentally related to your teeth, your nails, and also mammary glands. So we know that the mutation that's associated with thicker hair also has effects on dental morphology, as well as mammary gland morphology. So in terms of asking the question of like what was being selected, we don't know the people that I've talked to who've worked on this, suspect that it's probably going to be more mammary glands, they have reason to believe that that might be the case. So again, we see hair maybe being shaped as a consequence of pleiotropic selection, basically, or selection on another trait. Now, when it comes to pigmentation, I think this one is really, really interesting. I think pigmentation is a great example of we selected for something somewhere and now oopsie, it affected the entire body. So if you look across Europeans, various genes had been associated with hair color, are associated with pigmentation more broadly. So it's really difficult to say like, oh, there may have been selection for lighter hair specifically, it's really hard to like narrow that down. And it makes a lot more sense that it would have been selection for skin pigmentation. Because again, if we're thinking about, you know, what would it look like if we had sexual selection? What are the issues? Well, the issues are if we fluctuate in what we find attractive, then it's hard to have

consistent selection. However, you know, it's really consistent the need for vitamin D. So if we're selecting for lighter skin to maximize how much vitamin D we're able to produce, you have very clear directional selection that could produce all kinds of lightly pigmented phenotypes, whether that's just the skin or it's skin, eyes and hair. So I think that's pretty much it.

Art Woods 19:57

So you're saying selection on skin pigmentation maybe dragged along the pigmentation patterns in hair and eyes.

Tina Lasisi 20:03

Exactly, with the exception of Melanesians with blonde hair, because that is the one example that I know of where you have individuals with dark skin and light hair.

Art Woods 20:16

Interesting. So it's decoupled for them. Yeah.

Tina Lasisi 20:18

Exactly. So that's very interesting.

Art Woods 20:20

We want to talk in a little more detail about evolution of skin pigmentation, in a few minutes, but before we move away from that I think we still have some hair things to do. And here's a maybe sort of deeper evolutionary question about about hair that I was thinking about, as you were talking about patterns of variation across the world. And that is, what was the hair like that Neanderthals and Denisovans, and Homo floresiensis and all of these sort of hominid groups that, you know, have contributed in some way in some populations to our current population genetics. So what's known about their hair?

Tina Lasisi 20:50

I'm so glad that you asked. One of my toxic traits is that at the end of every conversation, I'm always like, and Neanderthals and Denisovans. So if we're thinking again, about the issue of hair doesn't fossilize, the epidermis doesn't fossilize, you know, you don't have any information on the integument. So that is one of the biggest question marks that we have out there. What was going on there. And this is where I'm really excited about a lot of my future research, because we still don't understand very well, the genetic basis for hair morphology, hair distribution, and skin, skin pigmentation we know a little bit

more about, but we don't really know how hairy someone is based off of their DNA. We don't know that yet. But once we're able to know a little bit more about it and know better what the range of genetic variation is that's associated with different hair morphologies, we would possibly be able to look at Neanderthal and Denisovan genomes and say, okay, this is what was going on there. So, at the moment, all we can do is what we evolutionary biologists love to do, which is make really nice educated guesses and tell like a cute story. So let me tell you a cute story. So if we are hypothesizing that once humans became bipedal, had basically the the body plan that we see today, there was a little bit of lag time before brain size caught up now, if the limiting factor that was stopping us from having like larger brains was that we didn't have this passive thermoregulatory system of like hair coverage, then maybe the evolution of tightly coiled hair was what released that restraint and allowed early Homo to grow these larger brains. So if Neanderthals and Denisovans branched off after that, the assumption would be that they came from a population that started off with dark skin, hairless bodies that they could sweat from, and tightly coiled hair. Now we know that those populations that ended up across Eurasia went through a lot of population bottlenecks. So the question would be, if there was even the slightest benefit to having any kind of change, how quickly would they have lost skin pigmentation or hairlessness or maybe tightly coiled hair? We don't know yet, but we already have some evidence that, you know, like lighter pigmentation was something that we saw across Neandertals. When it comes to hair morphology, we just don't know enough about the variants that are responsible for it. But I wouldn't be surprised if it was lost based off of what we see in modern populations. Again, thinking of you don't have the same range of variability in hair morphology outside of Africa, as you do in skin pigmentation. To me that says maybe hair is a simpler trait genetically, where there are fewer variants that are responsible for it, and therefore it might be easier to lose that trait. And if you add on top of that, if you look across mammals, and I say this and I challenge everyone, I do not know a single mammal that has tightly coiled hair outside of humans. If anyone knows them, please let me know I have seen sheep that have crimped hair and like poodles that have, you could say crimps, maybe kind of curly hair, but it's nowhere near what we see is possible in terms of tight coils in humans. And those are both domesticated animals. So if no other mammal has this, to me, that says there might be something about it that is, quote, unquote difficult to evolve. So it might be difficult to re evolve if it is ever lost in a lineage.

Marty Martin 24:31

Wow. Okay, there's always a big list of what distinguishes humans from others, but curly hair has never been on any list I've seen before. I'm gonna have to remember to keep that one there. While we're on the topic of is traits of humans relative to other species. I've mostly worked on birds in my life. And you we've already talked about, you know, it's keratin in both cases and varieties and

keratin and all that but where are the blue mammals? Why, why don't we have any of the sexy, cool, super bright-

Art Woods 25:00

Iridescent green.

Marty Martin 25:01

Yeah, I mean, besides the, you know, the versions that we get from the stores. But obviously not talking about that, the natural blues and greens. Why don't humans or why don't mammals have this color?

Tina Lasisi 25:11

That is such a great question. I'm so happy that you're a bird person. I love bird people. Birds, awesome, great colors. Humans are boring. Apes are boring, like in terms of coloration are boring. Primates in general are kind of boring. Once you get to like South American monkeys you know, you kind of get some cool stuff. Some lemurs are kind of cool. But in terms of what the options are for the colors, we really see that it's light to dark in terms of how much eumelanin you have. And then the red axis of variation that we have is based on pheomelanin, so a variant of melanin that has that, you know, red yellow coloration. So that is really the range of variation that we're going to see. And when we're talking about blue, the only place that we see blue in humans is blue eyes, and it's a structural color. So as a bird person, I'm sure that you know, like actually looking into those feathers. The reason that we see these iridescent colors we see blue is because of the way that different fibers align with each other and when the light hits them, you get this perceived color of blue is the same reason that the sky appears blue. So is it Tyndall or Rayleigh scattering, I always forget one of the two but some kind of scattering of the light that gives the perception of there is no blue pigment. Because blue pigment is very rare in nature. To my knowledge, it's only a kind of a butterfly. I want to say there's one kind of butterfly that produces a bilirubin based blue pigment and like that's it blue just doesn't exist as a base pigment to begin from. So that's why primates are boring.

Art Woods 26:55

Super disappointed to be in such a boring lineage. Okay, something else about hair, baldness. Why? Why do some people especially males of some groups go bald?

Tina Lasisi 27:08

Inevitably, when I give a seminar on hair, someone will ask okay, but like why am I bald? It's usually a question about themselves. And that's when I have to

say, I'm sorry, evolution just does not care about you post reproductively if you were able to have offspring. That's it.

Art Woods 27:26

Just another consequence of aging. Yeah.

Tina Lasisi 27:28

So if we think about it in terms of like, again, this ultimate why like, why is this even possible evolutionarily, it's because it doesn't necessarily have a consequence to your fitness to your ability to have as many offspring as possible. You just got to get it in early. Now. The proximate reason, to me that is, not only is it interesting, but if I were ever to solve baldness, I would be the richest person who has ever walked this earth.

Marty Martin 27:55

You'd be doing well.

Art Woods 27:56

Like Elon Musk level rich.

Tina Lasisi 27:58

Oh no, forget him. Like, you know, he would literally be ridiculous compared to me. And so I'm actually interested to go into this realm just because when it comes to hair, it's just such a, the hair follicle is this mini organ that is just this fascinating thing that allows us to experiment with all of the different ways that you can modify it even within an individual right. And when it comes to hair loss, we know that it has something to do with hormones. But the question is, what is it about the scalp hair follicle that gets exhausted? Like why senescence there? Why does it die off? And, you know, we can ask a similar question about pigmentation because you see a lot of people regardless of skin color in humans, who will have de-pigmented gray or white hair at a certain age, however, their skin still seems to have active melanocytes. So these are two like open questions of like what is happening in this little system that is causing relatively early senescence in terms of before that organism individual dies their hair follicle on their head just gives out but their beard is going strong. And really eyebrows. My favorite thing is like if you ever see an emeritus professor, look at their eyebrows. I'm just saying. I'm just saying.

Art Woods 29:18

Super bushy. Okay, I'm gonna collect the data. Well, great, I think this might be a good time to switch over to talking about patterns of skin pigmentation. And let's just start I want to I know earlier in your career, you worked with Nina Jablonski and Mark Shriver and just wanted to ask you, first of all, what were you doing with them? And what was your sort of entree into that whole field?

Tina Lasisi 29:47

So I'm actually going to grad school. I already knew I was going to work on hair, and that's why Nina wanted to have me as a graduate student, she was looking for somebody who was interested in that question, but of course I can't be around Nina Jablonski and not learn about skin pigmentation. Same with Mark Shriver, they've both done work on this. So Nina especially has contributed to the field with the knowledge that we now have and like spread widely about, oh, vitamin D selection for lighter skin folate selection for darker skin. That was a lot of her work. And it's also relatively recent work. So like actually talking to her, and looking at the timeline of those hypotheses, I'm like, huh, the year 2000. And she would tell me how people would argue with her just saying that it's like ridiculous that it doesn't make sense, it couldn't possibly be the reason because, you know, dark objects heat up in the sun. So like, obviously, it can't be a useful trait to have in a hot, sunny environment. Fun times. And with Mark, I was able to especially get a better grasp of the genetic underpinnings of skin color, its genetic architecture and selection for it, and what that looks like, you know, across the genome, how we can understand the signatures of selection. So really, with both of them, I was able to explore that, and especially I've looked at admixed populations, so populations with ancestry, populations that have previously been isolated, I'm looking really at African Europeans in the US. So African European admix people and in South Africa, where we have much more complex admixture, like four way admixture from different populations, which is really interesting. And what's great about admixed populations is that you have the ability to find the genetic basis for a trait usually with like smaller numbers of individuals, because you have these big chunks of genomes that are basically tagged to a particular ancestry, and that you can associate with your trait of interest, in this case, skin pigmentation.

Art Woods 31:45

Well, before we dive into some of that stuff, maybe let's just focus for a minute on the vitamin D and the folate ideas, which we kind of passed over, Just for our listeners, maybe just lay out. So what are those two selective pressures? And how are they related to skin pigmentation?

Tina Lasisi 31:59

So, when it comes to vitamin D, we are able to synthesize this ourselves, it's necessary for a certain nutrient for our body, but we're able to synthesize it

with basically human type photosynthesis. So if you go out into the sun, that radiation goes through your skin and is able to hit that precursor and go through its whole chemical process where it becomes this bioavailable vitamin D for you. Now, this is what I think is super cool about this. It's very much the biophysics of this, the reason that you're able to convert more or less of this precursor into Vitamin D has to do with how much of that UV radiation is able to penetrate. Now, it's going to be in direct competition with something that absorbs UV radiation, like melanin. Now, that can be a very protective thing. But if you're trying to maximize how much vitamin D you want to make, because there's less radiation to begin with, it's going to be an issue. Flip to the other side, folate. Folate is going to be floating around in your bloodstream. And it is especially important for during pregnancy. So you'll see that that's something that's in a lot of pregnancy vitamins, like you know, like folic acid has folate, because if you do not have enough folate during pregnancy, a baby can be born with an open spine. Now, what I really like to think about when we have hypotheses evolutionary hypotheses is how does this affect whether you're going to have more babies, I have rarely seen a clearer, open spine bad. Okay. So that is a very clear selective pressure, where whether you're talking about, you know, the mother's health in general, the offspring's health, folate is going to be an important thing. So being able to have enough of that makes sense from an evolutionary perspective. Another reason that I emphasize the how it works in terms of pregnancy. And what it could do to the baby is because a lot of people ask like, oh, well, isn't it sunburn, isn't it cancer, but when it comes to cancer, again, similarly to baldness, usually it affects you at post reproductively, so that couldn't really be a strong selective pressure. And when it comes to sunburn, I mean, it would have to be pretty bad. And you usually have like a behavioral response to it where it seems like it would be really difficult to imagine an organism that is getting harmed actively and doesn't understand to get out of the sun. Right. Negative feedback loop. That said, Australian people on beaches, so you know. Yeah, there you go. So I guess a related sort of data question is about so dark skinned people at higher latitudes, where presumably they're having a hard time synthesizing enough vitamin D. And the flip side of that very light skinned people at low latitudes, getting their folate blasted, are there clear, like obvious sort of problems that they're having, are there data that demonstrate that? So you mean modern individuals?

Art Woods 34:57

Yeah, this is gonna be a lot of stuff about like modern diets and you know, spiking milk with vitamin D and that kind of thing. But for example, like before the advent of vitamin D spiking, did dark skinned people at high latitudes, were they more likely to get diseases like rickets, which can stem from lack of lack of vitamin D.

Tina Lasisi 35:15

So what's really interesting is one of the biggest pushback that's been received against the vitamin D hypothesis is the fact that we don't see a lot of evidence of rickets, it's like we would have expected more of that, right. So it may be that the way that vitamin D was affecting health may have been more subtle vitamin D is involved in so many processes, like I swear, every day, a new article is coming out about vitamin D is involved in XYZ, it might have affected immune systems in a way that we can't necessarily see in the fossil record. But it is a great question of like, do we have any historical documentation of populations being exposed to a new environment for the first time in however many generations and all of a sudden having these issues? Now, I don't have any knowledge of that. But I would be really interested in this question in general, in general, I have been interested in people who can do more historical work on evolution, right? When I think about the first time that populations were exposed to each other, what did they see? What did they think, what did they observe? What did they perceive? What did they hear from the other in terms of what it was like to live in that environment and what it was like for them to move to this new environment, for example. And I don't think that we actually have enough data on that yet, I say enough data, I don't know of a lot of scholarship that has been done on that. And if anyone does have that knowledge, I would love to hear it.

Marty Martin 36:37

So we did the exercise just a minute ago about sort of global patterns of hair variation. And if you want, we can do the same thing with skin variation. But let me there's a motivation I have in sort of wanting to talk about that kind of thing. If someone was to ask you, maybe given the context of your current research, although I know that is more about hair than skin. What are the main factors that produce variation in hair or skin color among people? Like, you know, stacking up this fraction of this gene? And all of that kind of stuff? We could talk about it that way. But how do we think about the way that different individuals come to have different skin colors? Especially when you take into consideration the whole burning phenomena and other inducible changes, developmental changes in color? I mean, what are the major things we should think about, the contributors to variation at the individual level?

Tina Lasisi 37:27

Hair is hard skin is way easier. Skin? Oh, I can do skin.

Marty Martin 37:31

Oh, good, okay.

Tina Lasisi 37:32

Global variation and skin pigmentation in baseline or constitutive skin pigmentation, I'll explain what that is in a second is very clearly patterned by the amount of UV radiation that is received in an inner region. So you can as a rule of thumb basically say, the closer you are to the equator, the darker skin is and the further you are from the equator, the lighter skin is, but really what the factor is, is UV radiation. And that is especially evident in places that are at high altitude because they receive more UV radiation. And so when you overlay that pattern, and you ask, okay, for individuals where their ancestors have lived in this specific region, for enough generations, do they follow that pattern? And we see that the answer is a resounding yes. Which is beautiful. We love a beautiful correlation. We love a beautiful, single factor explanation.

Marty Martin 38:23

Biology's never simple. That's wonderful.

Tina Lasisi 38:26

Exactly. Biology is never simple. And especially with humans, oh my god, they're so annoying, because they keep like using culture and behavior. It's like, oh, my God, just please, please be an experiment that I can like understand biology. Now, what you brought up is in terms of development, which is very interesting. I specifically said constitutive or baseline skin pigmentation. So the idea of having baseline skin pigmentation is there is a certain level of pigmentation that you will attain without necessarily input from the sun without tanning, really, that's contrasted with facultative pigmentation, which is the pigmentation that you can attain in response to solar radiation, ergo tanning. And so when it comes to measuring that, as anthropologists, we have to measure an area of the body that we think is like not exposed to the sun. Now, there are a number of areas that you might think, hey, where that never sees the sun.

Marty Martin 39:26

Where the sun don't shine, right? I think that's a saying yeah.

Tina Lasisi 39:29

Exactly, where the sun don't shine is a thing. However, we use the inside of, the inner upper arm as a proxy. And, of course, everything is complicated, right? I am skeptical that there are certain parts of our body that are completely unaffected by solar radiation. You don't necessarily have like, you know, a cut off of okay, hey, the sun only came here. So it's only going to have a response here like your physiology is more complex than that. So you know, it can, it can spread so like we don't know exactly what the body wide effects are of solar radiation. And if they're if we really have been measuring skin that is entirely

unaffected by solar radiation. Also, you lift your hand up every now and then you know, that's gonna get some sun.

Art Woods 40:12

Interesting. So you're saying that maybe a big dose of UV on your face or your back is enough to get you to tan on your inner upper arm, which is a standard place to measure. There's like a more systemic response.

Tina Lasisi 40:24

Yeah, exactly more systemic response. But even like, just like, you know, maybe your lower forearms or maybe your outer arm like I would I just feel like if I was in the sun for long enough, my inner arm would also get darker if my outer arm was also getting darker. But, you know, we definitely have clear evidence that there's differences between these regions that we consider to be baseline, and these regions that we consider to be indicative of tanning. So within an individual, you can always see that that contrast, which is informative in and of itself.

Art Woods 40:53

Yeah, gotcha. So I wanted to ask about genetic bases of variation in skin pigmentation around the world. I know you've worked some with others on trying to understand what are the sorts of loci that influence skin pigmentation, and you know, are there a few of large effect? Are there many of small effects? And how does that vary according to where you are in the world? So maybe, maybe tell us about that.

Tina Lasisi 41:18

So, when it comes to the genetic basis for skin pigmentation, depending on what population you look at, or what populations plural, different variants are going to be associated with a variation that you observe. So when we look at the difference between Northern European and West African populations and their skin pigmentation, you have a couple of large effects variants, including in this one gene called SLC24A5, where it explains a lot of the difference between those populations. And in 2017, 2018, Sara Tishkoff, and Brenna Henn's labs came out with really awesome research on the genetic basis for skin pigmentation across various African populations. And what we learned there is that there were a lot of genetic variants that we hadn't previously identified as being relevant to human skin pigmentation, because they weren't necessarily variable or related to variation in skin pigmentation in other populations. So that's really what the interesting thing is about skin pigmentation about a lot of traits is that there isn't really a gene for and I'm sure that you guys have talked about this in other episodes, like, you know, this language of like, there's a gene for this, there's a

gene for that there's so much genetic variation that's associated with so many different traits. And there's a lot of ways of, you know, creating the same phenotype. And when it comes to skin pigmentation, in a lot of African populations, we see that there's a lot of small contributions from different variants than the ones that are associated with these big de-pigmented changes in Europeans and East Asians.

Art Woods 42:49

So do you see a lot of convergence in different populations that have evolved dark skin or light skin independently? So is it does it involve parallel kinds of genetic changes? Or does that does what you just said, mean, there's like multiple pathways to get to the same phenotype?

Tina Lasisi 43:03

So yes, and yes. So both in terms of light skin and in dark skin, let's start from like the evolutionary biological perspective, the phenotype, clearly there was convergence. Individuals who are living in like low UV areas that are very distantly related genetically seem to evolve lighter skin, individuals in populations that live in high UV areas converge on having darker skin. Now, does the genetic variation converge? Yes, and no. In some cases, we see that the same genes are being called upon with different variants underlying the exact mutation in these different populations. And in other cases, it's a different set of genes that are causing this lighter or darker phenotype. So both are available possible and visible in humans.

Marty Martin 43:54

One thing you said just a second ago, Tina, that I thought was really neat, and then, at the same time, worried me about something that I've thought about many times in the past. If there's so much diversity in Africa already, and we're like coming to appreciate that a lot of the things that we do with respect to human health, you know, the genetic databases that they have are dominated by particular datasets that tend not to include Africa, if there's so much diversity in Africa, how are we ever going to capture all that diversity? I mean, that's really expensive and time consuming. I mean, like, how much do we expect? And how much more do we need to do to make sure we have sufficient coverage?

Tina Lasisi 44:28

I mean, I guess it depends on what you mean by sufficient coverage. Right. So over the last 10, 20 years, we've seen an increasing push to provide people with precision genomics health care, and that involves understanding the genetic basis of various traits, especially disease traits. But who do you need to study in order to understand the genetic basis of various traits? Like there's basically

two different approaches I would say. One is, okay, the populations that we're trying to develop treatment for, we're going to look at them and we're going to try and understand what genetic variability within that group is associated with variability in their propensity to have whatever disease. Now another approach that people have used before is, you can look in completely unrelated human populations and find a variant that doesn't exist in your quote unquote, population of interest that is related to the disease phenotype. And then you can develop all kinds of treatments that are based off of that, because if you find a variant that is associated with a biological pathway, which is what you're interested in, that's really what matters, like the biological pathways that lead to various diseases, you're going to have similarities depending on what the condition is, right? So the question really is, what is enough? It depends what you what you want to do, right? Of course, the scientist in us hopefully would be like all we want to know as much as we could possibly know, like, money is not an object. But it very much is. So you want to cover as much as possible. But there's also a question of equity, which I'm saying, like very like wavily, because it's, it's complicated to take the US as the center of the world as it often is, if we think of the US and the different populations that have come together here to create the quote, unquote, like, you know, US population, different ancestries. What kind of coverage of the world would be enough to make sure that everyone in the US is able to benefit from precision genomics, that's still unclear. There's this idea that, oh, if we just have enough West Africans, that's going to give us enough knowledge of the African ancestry component and African Americans, and that's good enough. We don't necessarily know that that's the case. African American ancestry is more complicated than just they're all you know, Yoruba from Ibadan, which I always say, because I'm actually half Nigerian, my family is Yoruba from Ibadan, and I'm like, as cool as we are, we do not represent all of African variation. We just don't.

Marty Martin 47:01

Yeah, well, that was that's the perspective I was coming from. Because like, yeah, I mean, there's so much more diversity of all kinds in Africa. I just, it's it's expensive. It's just hard to even think about how that's going to work.

Tina Lasisi 47:12

I mean, it's not, honestly, I think that the issue isn't one of pure like costs, right? I think that it's more the distribution of resources and capacity. I think that if researchers that are currently able to do these large scale genetic studies are inspired to do less helicopter research and more training people and building capacity in various places, that this is going to be something that takes off and innovation is going to take off technological developments going to take off like as far as possible as we can spread knowledge and resources, the more fertile ground we have to have technological development, which then make everything cheaper moving forward. And this is something that I've especially seen in a lot

of indigenous genomic scientists who are pushing for building capacity in their communities. If you give us the ability to study ourselves, like we're motivated to do it, we want to do it. And we're going to be able to push for innovation that is going to provide information that everyone ultimately benefits from.

Art Woods 48:16

Well, I think we're getting toward the end. But we wanted to ask also about your perspective as on the relationship between skin pigmentation and hair morphological characteristics and race. And so we read your 2019 AAPA, so American Association of, BA Biological Anthropologists statement on race and racism. And you guys had some super interesting points about that relationship. So how should we think about human variation in skin color, which are, you know, some of the things that are the most apparent to everyone in the world looking at each other, and the sort of constructs of race that have been with us for for so long?

Tina Lasisi 48:49

No, I love that we have like a nice little light topic to finish off with.

Marty Martin 48:53

Something easy, you know, it's Friday.

Tina Lasisi 48:55

So I'm glad that you brought that up. I often bring up that statement on race that, you know, I was a co author on as I don't really know that it did what we wanted it to do. And I wrote a later piece on racialization of traits. So basically, when you look at skin pigmentation, and hair morphology in hair in general, these are traits that we call racialized traits, which means that they are traits that we associate with various concepts of race, it's traits that we have built a relationship with, where it's really difficult for us to not see them through this lens of there are these different races of people, and that corresponds with differences in these traits. So a lot of what I have done in my career is attempt to decouple that by removing as much as possible, the subjective bias of describing a trait. So in describing a trait that is where we can most have issues with bias because you end up getting this circular reasoning. So to basically say what's often done in like some forensic contexts, and some dermatological contexts is they'll say, oh, this is an African hair, because it belongs to somebody who is African. But also it has features of an African hair. And this is an East Asian hair that is like it's an East Asian type hair, it's Caucasian type hair, right? That in of itself is like circular reasoning. And it doesn't allow you to look at variation. So when it comes to race, one of the things I always bring up is, there are so many different categories or so many different taxonomies when it comes to race that,

you know, it's hard to even pick one but even if you want it to say okay, broadly, like we agree, right? Like there's Africans, there's Europeans, and then there's Asians, what if those didn't exist? And why do we constantly refer to them? And that has to do with the limitations of being able to discuss something. We often talk about these different groups as if they are very divergent, distinct and distantly related to each other, even though we know that is not the case. Because populations don't live on these continental islands because these continents are connected. And so especially as you go towards the I guess, the borders of these continents, you see that there is a gradient in whatever phenotype it is that you might be interested in. And there's also more genetic relatedness between populations that are closer to each other. So it's really an isolation by distance if you're looking at genetic variation. So the further populations are from each other geographically, the more distantly related they are genetically, which makes sense right. Now, when it comes to race, the way I like to think about it is race is left over from Linnaean taxonomy. I love to blame Linnaeus for everything. But Linnaeus didn't believe in evolution, right. Evolution postdates Linnaean taxonomy. And so from that perspective, if we think about natural history, and the people who are doing natural history, what they were able to do, and they, gonna be generous here tried their best to do, is to look at things, observe things and say, okay, if I categorize them in these ways, that might reflect how closely they are related to each other. And in general, in some ways that does hold, right. The more similar something is morphologically, the more likely it is that it's closely related to each other. But what we see with humans is that they've just moved around a lot more, you know, once we even start bringing in Neanderthals and Denisovans, like, we see that it's not that humans, quote, unquote, left Africa and made these different populations, there's been constant movement and constant gene flow. So that means that humans aren't really going to be distinct enough to have, you know, sub species level differences. Now, when it comes to social ideas of race, really, what's interesting is, what phenotypes do we think matter? And what we see is that depending on what categories we're talking about, we have different inclusion and exclusion criteria. Again, taking the US for an example, what it means to be black in the US has historically leaned a lot on ancestry also, right, not even necessarily phenotype. In some cases, it's been like, if you can demonstrate that someone had any African ancestry, they were black, it doesn't matter what your phenotype is. Nowadays, it's like leaning more towards being phenotypically based for all kinds of reasons that I'm sure other people are better able to discuss. But what does it mean to be white or European, certain inclusion and exclusion criteria. And if you look within Europe, Europeans have like an amazing history of being able to do just the most sophisticated racism. Love that for them. No, I'm joking. But you see the people, were able to see differences that we don't necessarily think exists. So one example that I always give is the Sámi, indigenous Sámi people of Lapland, also lived in Sweden, were heavily discriminated against by Swedish people to this day still are in some cases. And if you ask many Americans, hey like, do you not see this as an indigenous people? They don't. They're like, oh, that person looks white to me.

Well, Swedish people in the early 20th century definitely didn't think so they could tell you, well, this is exactly where their hair is different, and their face is different. So it's a question of what phenotypes do you perceive and do you believe are important? And similarly, another example that I give in my classes is people from Papua New Guinea. Most Americans who see someone who Papua New Guinea would be like, oh, that's an African person. That's a black person. And this is a game that I've played because in general, I don't like to lecture people and tell people what to think. There is not a grand conspiracy to hide, you know, the truth of race from everyone, I swear. So what I do is I actually have this exercise where I give people pictures of people's faces from all over the world and I I tell them, Okay, you can like group them in whatever groups you think makes sense. Or you can put them wherever you think they come from in the world. And every time people learn something, and I learn something about what people think makes sense. For example, doing this exercise in the UK, we have this idea of like North African as like a distinct group of people and you know, Turkish as a distinct group of people. In the US, a lot of those groups, individuals were like, oh, no, they're Hispanic. That's what they look like to me. Right. So that's not a concept that we have in Europe of like Hispanic, but it's a group that Americans have. And that kind of shows you the murkiness and how the subjectivity of race works. No one says that there are no differences, but it's how these differences are structured.

Art Woods 55:44

Yeah, totally makes sense. I want to just circle back to one thing I said, I said, American Association of Biological, it's Physical, American Association of Physical Anthropologists.

Tina Lasisi 55:51

No ,no, it's Biological Anthropology. So like, that's not on you, we changed our name, and it took like three years for us to change our name. And so now you see both things, but we go by Biological Anthropology now.

Art Woods 56:01

Okay. So I got it right, by mistake. That doesn't usually happen. I just wanted to ask sort of a, I guess, this is a philosophical and a practical question. But you know, given what you just said, which makes a lot of sense, like, how should biologists interested in studying variation in human traits, approach their projects, and discard the sort of harmful categories of race that might come into play? And I think, you know, maybe your approach in this methods paper on hairs is the way to do it, right, which is to focus on the actual quantitative patterns of variation, and not categories, which can slip over into this being infected by ideas of race. Is that what you would advocate?

Tina Lasisi 56:41

So yes, in an ideal world, I would tell everyone, like just measure your phenotype really, really well and use genetic data. However, over the last few years, I have definitely seen various contexts where maybe that isn't entirely feasible. Now, if you are a geneticist, or an anthropologist, like, nah, you should be able to do that. But I'm thinking here specifically about I don't know, if you're doing some kind of cosmetics research, or if you're doing maybe kinds of dermatology where you don't want to ask people for their genetic data. That might not be feasible. But the ideal scenario is allowing some information about people's genetic relatedness. That's really what you want to have as your background information. Like instead of necessarily grouping people really want to ask like, how closely related are people to each other? And how genetically similar are they to each other, that allows you to then have this background against which you can compare your phenotype of interest. And it allows for more complexity, right, it allows for some individuals to share 80% of their recent ancestors versus others share 65 or 75, without necessarily drawing that cutoff point of okay, we're going to put you in this ancestry group or that ancestry group. And if you're trying to understand like, the genetic basis of a trait, again, genetic variation is more useful than necessarily having population groups.

Marty Martin 58:02

Yeah. So this is, I was going to ask a version of that question. So let me tweak it a little bit and ask and ask you to add another element of it. You're about to start your lab at the University of Michigan, yeah? And so graduate students are going to be coming in looking for projects, I know you've got 1000s of things in mind. But they're moving into this space where, you know, they're going to have to deal with these these more complicated issues than my graduate students that are working on, you know, house sparrow conversations. It's not the same kind of thing at all. Not that they I'm not trying to minimize the struggles that they have, my students do work very hard. But at the same time, how are you thinking about the projects that that you'll be working on? And especially, what kinds of things do you have in mind about talking to your graduate students that are coming to work with you?

Tina Lasisi 58:44

That is, that is a great question. In general, I'm just very excited about this, right? My biggest beef in my discipline is the fact that we started messaging to people race is a social construct, it's not very, very helpful. And it's ended up creating the situation where people don't really know what a social construct is, and they just feel like talking about human differences is bad. So I want to move away from that narrative and allow people to understand the depth and complexity of things. And so the way I try to teach students about this is

ancestry is a dimension of variation, right? There's a dimension of how closely related individuals are genetically, what environments those various genetic ancestors were, like subjected to and how that affects the phenotype. That's not a bad thing. It's not, differences are not negative, necessarily, or positive, can be neutral. And then another dimension of variation that I'm really interested in is sex. And again, that's another thing where we have a huge, unnecessary level of controversy and people who don't understand biology saying that it's simple when those of us who study or like I wish it was I wish it was simple. You know, letting people understand like okay, let's put the social to the side, let's put arguing with people about what is and isn't to the side. And let's look at how, what the history is of this trait like, you know, what is its evolutionary history? And what is its history within an individual organism? Look at that amazing change across time, and try to see how you can articulate that pattern and describe that pattern. And nowadays, again, like, you know, it's the computational, we have incredible computational tools that mean that we don't have to rely on these simplistic frameworks that we did back when everything was an ANOVA. You can see statistical trauma.

Art Woods 59:58

Let me ask also, you said something earlier about the AAPA or AABA statement, maybe missing the mark a little bit. And so I guess how do you think it missed the mark? And how would you update it to be better if you had the chance?

Tina Lasisi 1:00:51

So I mean, part of the reason is like, what is the function of a statement, I mean, if the point of a statement is to be like, this is, what our position is, and like, you know, boom, here you have it, it does the job. But if we're trying to communicate to people, hey, this is how human variation works. What I would want to impress upon people is that, really, we have a lot of different factors that we're interested in, which include genetic relatedness of individuals, which is complicated. How closely related individuals are isn't a simple question of this is the group you belong in versus that group. And then what the phenotypic variation is that coincides with that is also complex in terms of overlaying things. So really distinguishing for people the difference between ancestry and phenotypic variation. And really, I feel like I still have a lot of work to do in order to figure out exactly how to communicate it, right. But I really would have wanted us to think more of what is it that people want to understand? And to me, in my experience, the question has always been like, why do we look different? Which isn't a bad thing, necessarily, right? But it's just a complicated answer. And when someone says, like, well, why can I see a difference between this person and that person? You can give that answer, and it doesn't have to be loaded. But it's going to have to go into a little bit more depth than okay, there are differences, or are not differences. So let me go back to that. Basically, if I could go back, what I would do is I would place less emphasis on arguing

whether there are or are not significant differences between groups, and rather, I would explain what the differences are and how they are patterned, right, like there's a lot of theoretical explanation in there are about why differences are or are not significant. What the harmful historical rhetoric has been around these things. But there isn't enough to give people something to walk away with, I wish that we would have better filled that void and empowered people so that we could tell, give them the information so that they can say, oh, I know why this person like, you know, looks like this. Like, I know why they have this hair. I know why they have this skin color. I know why they have this other trait. And it's because of these reasons, and those practical little nuggets of knowledge, those are the things that people benefit most from rather than this high level theoretical question of whether taxonomy does or doesn't make sense, which I know bird people struggle with, as well. I know y'all either have a lot of subspecies or none at all.

Marty Martin 1:03:24

Well, that's all we argue about. That's my favorite thing to do. Just argue about it. Well, Tina, we're becoming a little bit sensitive to your time. This has been a fantastic conversation. But I've got one more little thing before we wrap. You are big into sci comm. And you are very good at it, as is obvious from just chatting with you today. What kinds of things are you thinking about on that front? Is what we've been talking about in the last few minutes something that you're focusing on? Or what's coming?

Tina Lasisi 1:03:48

Absolutely. So I started hosting a show for PBS called Why am I like this? Which is,

Art Woods 1:03:56

Awesome.

Tina Lasisi 1:03:56

Yeah, thank you. So it's a show about various traits and asking the question, okay, why do I have this skin color? Why do I have hair like this? Why do we have the ability to smell, and giving people the evolutionary biology that explains you know, the why there. And that's been incredibly fun to do. It is a lot more, 10 minute videos actually take a lot of work y'all okay? Just like, just know that. But I want to do some more work now on social media, like on a more casual setting, to interact with people and give them information like that is really what I enjoy doing. Like, I want to empower people to talk about human variation without it being a loaded controversial thing. I want to encourage people to be curious about it. And to not feel like it is this bad, hot topic because

it's so cool. Like, it's all of what I've been studying, you know, over the last 10 years. And I think that a lot of people would benefit from it, especially now that we're moving into the realm of facial recognition. There are all kinds of technologies that whether we like it or not, I require an understanding of how variation in various biological traits works. And so I want to be able to give that to people and just like inspire more people to look into this and figure out other cool things about human variation.

Art Woods 1:05:13

Oh, fantastic. Well, I think that's a great place to stop. Usually, almost always when we're signing off, we do give our guests just the chance to say anything else that they want to say if there's anything we didn't ask you about that's on your mind.

Tina Lasisi 1:05:25

I, my head is empty, just vibes.

Art Woods 1:05:32

See earlier conversation.

Tina Lasisi 1:05:34

See earlier conversation, exactly. What I said before.

Art Woods 1:05:38

Thanks for joining us on the show. It's been super great to talk to you.

Tina Lasisi 1:05:40

Thanks for having me.

[Music break]

MM: Thanks for listening to this episode! If you like what you hear, let us know via Twitter, Facebook, Instagram, or leave a review wherever you get your podcasts. And if you don’t, well we’d love to know that too. All feedback is good feedback!

AW: Thanks to Steve Lane, who manages the website, and Ruth Demree and Brad van Paridon for producing the episode.

MM: Thanks also to interns Dayna de la Cruz, Daniela Garcia Almeida, Kailey McCain, and Kyle Smith for helping produce this episode. Keating Shahmehri produces our awesome cover art.

AW: Thanks to the College of Public Health at the University of South Florida, the College of Humanities and Sciences at the University of Montana, and the National Science Foundation for support.

MM: Music on the episode is from Podington Bear and Tieren Costello.