

# Scicomm against misinformation

**Jen Novakovich:** Welcome back to The Eco Well podcast. This is a show focused on the science of skincare, I'm Jen and I'm your host. In continuation from last week we thought we'd continue to unpack science communication before our winter break. What role do science communicators have in combating misinformation?

Are we the only line of defense? Or are we doing more harm than good? Today we're joined by a panel of sci-commers from the beauty and health space. I let each of the panelists introduce themselves. We had some trouble initially getting Michelle from lab muffin onto the panel but this is the way when you're learning something new. Speaking of, this episode aired live on our discord server. We're trying to use discord to bring you an alternative to the one sided dialogue that is most media today. So watch that space in the coming year, we're hoping to shake things up. Sorry for the preamble without further ado lets start the show.

**Lalita:** Hey everyone. My name is Lalita Iyer I am a cosmetic chemist based in the east coast. Lovely to see everyone here. I think I'm familiar with everyone so nice to see everyone. I am like I said a cosmetic chemist. I also go by the name skinchemy on Instagram and Twitter where I just talk about skincare science behind skincare, and also talk about I'm also a sci commer where I bust myths and stuff like that.

**Jen Novakovich:** Jess, would you like to go next?

**Jess:** Sure. So I'm Jess, I'm a registered nurse and I'm in Queensland in Australia. I work primarily as an educator and academic and my areas of teaching are social media ethics and clinical sciences and skills. And I am on Instagram and Twitter also on j\_stokesparish. And I talk a lot about debunking information, but also giving people the skills to spot misinformation themselves.

And also just really keen on increasing the visibility of nurses on social media and in the media in general,

**Jen Novakovich:** Nini, would you like to go next?

**Nini:** Yeah. So I'm in California and I have my PhD in neural interfaces. So I'm a sensor designer but I've also been an educator. I taught for close to 10 years at

Cornell. And so I'm using a lot of my personal experience, like at work, my professional experience doing a lot of the sensor design and risk analysis combined with my experience as an educator to teach people scientific literacy and digital literacy and, put together tutorials very statistics focus because that's a bulk of what I do.

And just guiding them through the thought process and understanding what are the limitations of the study and what does a data set actually mean pertaining to whether it's conclusive evidence or not.

**Jen Novakovich:** Esther, would you like to go next?

**Esther:** Hi everybody. My name is Esther Olu. I'm also the melanin chemist. I do some science communication on Instagram and Twitter, even though I've been a little bit Mia. Nice to see everybody again,

**Jen Novakovich:** So my first question is maybe first, whoever starts this off can answer the question. What is science communication, but then to add to that, why science communication and does it work?

Nini, would you like to go first for this one?

**Nini:** Oh, sure. I think science communication really comes down to a couple of things. I see. It's not just translating complex concepts into forms that are easier to understand, but also presenting them in a way that are relevant to the audience and, and that's where you get into the nuances of what people see us.

And I've talked about this before their perception of risk, right? So people have different apprehensions and different perceptions of risk. And I think that part of what we're doing is understanding what those are and presenting the information to really tackle that specific perception of risk. So I think it's really two-fold, not just presenting the science, but also doing it within the context of what is relevant to the specific individual or group.

**Jen Novakovich:** Michelle would you like to go next fingers crossed this worked.

**Michelle:** Hello? Hey hi, I'm Michelle chemistry, PhD newly qualified cosmetic chemist and science educators. So I've been doing lab muffin beauty science for about 10 years now almost. I've been teaching science for a long time. And I think the reason why I got into science communication was because I saw a lot

of my friends and people around me who wanted to know more about science, but they couldn't understand it.

And I think a lot of people don't really realize how relevant science is to the everyday life. And I think I saw a gap there and I wanted to fill it. So I think back when I was doing my PhD I was really active in a lot of Facebook groups and some of them were about nail Polish.

I was obsessed with nail Polish at the time. And I found all these people were asking questions. Like I've heard that these things are toxic. Are they toxic? Should I be avoiding them? And at the same time, I was also in a lot of groups with science communicators who were frustrated about anti-vax and things like that.

And I think I saw this disconnect there where like clearly people were communicating science about particular subjects, but not about other subjects that I thought really could require that. And I sold this pipeline in a way between, being scared of toxins in nail Polish and being scared of toxins in vaccines.

And I think, yeah, that's where. Science communication is so important because it is the pipeline. And sometimes, little things in everyday life not trusting science and everyday life leads to not trusting science. When it really matters.

**Jen Novakovich:** Lalita, would you like to go next?

**Lalita:** Yeah, I think, scientists like us on Instagram, we also play a huge role in essentially bridging the gap between us and the general public, whether that's skincare or healthcare or whatever it may be. And I think that is very important because we are able to understand the science and break it down into smaller pieces for, the general public to understand.

And I think, we're able to raise awareness this way on things that are important, So I really do think that one of the biggest roles in science communication is bridging the gap between scientists and the general public and this spans so many different scientific fields, like hard sciences, physical sciences, the technology, health, environmental science, and more and in fact it's amazing because there are so many universities now I've seen.

And even back when I was in undergrad, they had classes on science, communication and science writing, where we really learn how to understand,

complex scientific topics and try to break it down into smaller bits and pieces so that we are easily able to convey a message on a- whether it's a new technology or new chemical a new drug, whatever it may be- to the general public. And I do think it's just going to get more important for us to play a role as scientists online to spread awareness and also make sure that we're spreading accurate information.

**Jen Novakovich:** Just to add to what you just said with respect to education on science communication there are now master's programs, which are really exciting. You could even go so far to do a PHD I know the account I'm a big fan Raven, the science Maven. She did her PhD in science education, which I think is so cool. But back to the question, Jess, would you like to go to.

**Jess:** I guess as a nurse, having conversations from the bedside, translating science is really where I got started. And then with the pandemic and the explosion of information and misinformation. It was really easy to say. So many people jump into science communication and they such a long history to it. So if you look at some of the literature, even back from the early two thousands, they define science communication as the use of appropriate skills, media, activities, and dialogue to produce one or more of the following personal responses to science.

So there's this thing called the Vowel analogy and A E I O U so the idea is that you might have awareness. So you generate awareness about new aspects of science. You might generate enjoyment, appreciating science as entertainment or art. I the interest. So as evidenced with people voluntarily involving themselves in science, so it generates an interest in science.

It might also form the basis of opinion making and confirming science-related attitudes and also the understanding of science. And I guess it's not limited to those of us that hold PhDs and that hold science degrees. And as we see with, especially in skin and cosmetic formulation, I see so many influences online, but if so, passionate about science communications in their own way, and that has such great influence.

**Jen Novakovich:** And last but not least, Esther, do you want to go?

**Esther:** So I don't want to let regurgitate anything that everybody else has said. Cause I completely agree with what everyone else has said. I do want to add

that science communication also. It brings a dialogue and it also creates a diverse perspective.

And this is brilliant. It's really critical because what's going on today is there's so much fear being spread around. And if it wasn't for science communication, we wouldn't have this dialogue about, Hey, this might not actually be true. And this actually like a lot of nuances to these topics that we talk about such as COVID for example and to ask your other question, does it work?

It definitely works. It definitely works because now you're seeing more more I don't wanna say influencers, but more consumers being really informed about the decisions that they make or being really critical about the information that they hear from others. So I think it's really important and I think it has definitely been beneficial.

**Jen Novakovich:** Yeah. And I guess to highlight, does it work? I think that we're starting maybe to see a decline of quote unquote, clean beauty, and I think that's thanks to a lot of social media attention from science communicators on how I guess misleading the whole trend is, and that becoming more unpopular and then brands like Deciem putting out more science forward campaigns Nini. Did you want to say something?

**Nini:** No, I was just thinking to myself because Michelle started doing this 10 years ago and boy what's going to happen with like the vaccination cause, cause it's just been such a struggle especially here in the US. Like we're making a lot of headway, but I think that Esther really hit on a key point there, which is that fear component. And I think this is what, I'm not in like the cosmetics industry, but I'm assuming that this is also some of what like the fear-mongering ingredients which is exactly what we're seeing now with COVID vaccinations, fear induces, this response.

And once you're in that state of fear, people's natural responses to seek more information, they find more misinformation, it just continues looping forward which makes it a hard cycle to break. This is what we continuously encounter. So I just think it's really interesting to hear, your perspective as to what kind of strategies worked to break those like fear cycles, because that's exactly what we were seeing with the hesitancy and the fear around vaccination right now.

**Jen Novakovich:** Yeah. And I guess to add to what you just said, I interviewed a while ago relevant to this topic, Timothy Caulfield and something that he said was pretty much everything that you said, but to add people who are more

fearful are also more likely to share the content. So a lot of this content spreads like wild fire. How do we combat that? But I'll come back to that question.

My next question is around there seems to be a growing mistrust. I don't know if it's science at large, maybe it's in the healthcare space or in cosmetics. And I don't know if it's growing but this is my perception. So I'd be interested in your thoughts on firstly, that statement and also, why do you think this is happening if it's happening? And I feel like Nini and Jess will be maybe the most familiar with the science here, but I don't know if that's that's true. But Nini, would you like to go first here?

**Nini:** Yeah. As a risk analyst, one of the things that I look at is, you look at failures, right? So the failure right now is people don't want a vaccine, but you also have to look at what's the root cause between that failure mode. And very clearly it's secure is a lack of trust in institutions, particularly in healthcare. And the reasons are really very right for some people, it's rooted more in discrimination and racism um, and then for other groups, it's really, I was talking to like my friend she's an epidemiologist and we collaborate a lot and this is a really interesting, so historically, like if if you take a look at trends, just like human trends in our lifespan. We haven't been living this long for very long, right? Like it was the introduction of like cortisol steroids and antibiotics and vaccination that has increased our lifespan. And so naturally of course, we're living longer because of these interventions.

And we have, we live longer, we become more sick chronic illness. It's part of aging, but this hasn't been happening for very long. And of course you can imagine that the science can only catch up so quickly. So I believe that it's in those gaps or the cracks of knowledge that, that science doesn't have the answers to that you get a lot of the pseudoscience and the wellness behind, oh, I have to cure for that while also, painting chronic illness in this light of oh, it's your own responsibility to take care of.

So there's a lot of different themes in there, but in, in the healthcare space, it's really a combination of Lee's, epidemiological factors that have changed our lifespan and the health outcomes. But if you do look at health care outcomes, they are statistically a lot better overall. And it's something to really have present and reframe that conversation, because that's really what we see in as far as behavior with healthcare trends, people feel that their doctors don't have the answer and they get frustrated, and they're dealing with some type of, chronic disease or condition. And then, they find somebody who says, oh, I'm going to treat that for you. And of course, without a control, any experiment looks good.

And so they believe that these therapies, or these interventions that they're taking are actually curing them, which in reality is just part of, random variation that we expect to see. But there's just not enough knowledge around that. So a lot of that anecdotal data, that is it's the appeal to emotion and it really strikes a chord with many people.

**Jess:** Yeah. I totally agree. Nini I, and I think it's multifaceted. I think the first thing is none of this is new in the sense of distrust of organizations, distrust of government throughout history, we've seen distrust in many ways and for good reason, for some of these individuals historically women have had their concerns dismissed by medical practitioners and we haven't prioritized women's health research. There is legitimate reasons why people do mistrust organizations, science. I think it's also because of that lack of science literacy. And we've seen that, especially as say for example, in Australia the students choosing science topics has decreased, et cetera but secondly, I think what we're seeing is a failure of science communications. Governments haven't prioritized science communications as the forefront- the pandemic is the perfect example. We've seen a hostile environment of politicians fighting against each other, which approach should be taken.

We've seen scientists disagreeing in public spaces about which approach we should take. And we've seen really terrible marketing campaigns, especially here in Australia for our vaccine is virtually been no comms from our government until it's too late.

**Jen Novakovich:** Oh, that's an interesting point. And also a contrast to in Canada, where we have a very high vaccination rate, I think about 80%. 81 at this point, percent of our population has at least one dose. And I think that might be the population over 12 pretty high. But in Canada we have put a lot of funding towards science communication, just in contrast and it might also be like a population thing. Obviously a lot more research is going to have to be done past the pandemic to see what's going on here.

But there's a really great science communication campaign from Canadian sci-commers science, Sam is a part of it. So it was Timothy Cauflied and a number of other really amazing sci commers just to make the information about, for example, vaccines, more accessible and understandable, and they also do this on their own platforms and have received funding for this.

But back to the question Lalita, would you like to go next?

**Lalita:** Yeah, I think the answer why there is this widespread of misinformation online also really relates to the way social media works. There are so many reliable sources on social media, such as CDC or the world health organization. But that most social media platforms like Twitter, Instagram, The way they work, is they're not designed to prioritize the best and most accurate information, You'll see that they're designed to show the top posts on your explore page as mostly the content that's most likely to be engaged with. Whether or not that's accurate. And I think content that keeps users on the platform gets priority and, we don't know whether that's accurate or not.

I think so much of what we're doing and what we go online and misinformation, it really is driven by social media and the way these apps that we use on a day-to-day basis work. And each time it gets shared, maybe a celebrity would share it or like some other politician or whoever it is.

And they have such large platforms that misinformation, you know, whether it's to do with coronavirus or whether it's you, even in the skincare industry, I've seen that. You have these celebrities, sharing with millions of followers, sharing this information on a product or an ingredient, or claiming that something is toxic. So don't ever use it again. And it just keeps getting reshared and reshared, and most engaged with, whereas, a scientist like me, if I try to like- dispel that misinformation, it just gets nowhere because my engagement is probably much lower than a celebrity. So I think people perpetuate misinformation online because of the way these social media outlets work.

**Esther:** I completely agree with what everybody said and I do want to emphasize one of Lalita's points about social media, because I noticed on Tik TOK that people that had absolutely no science background were using these very ominous sounding like background music and saying, oh, they found that there was this poisonous ingredient, put in sunscreens blah blah blah.

And that had over a million views, a million views and a whole bunch of shares. And the people that are trying to dispel these myths, they weren't really getting a lot of traction. Not that they need to get attention or anything like that, but it also brings back to a point that Jen has emphasized a long time ago about conspiracy thinking.

And a lot of people, they tend to believe the opposite of the truth, or let's say that the government's poisoning us or we're microchipped or whatever because



it's more, convincing to them so I think social media has definitely played a big part.

**Michelle:** I think in general it is an uphill battle because everyone's been saying- Cognitive biases, all kind of point towards an easy explanation. People don't like uncertainty, and it's a lot easier if you're making stuff, up rather than trying to act off like an evidence base. To create a simple narrative that has one recall is that people can very easily buy into. And it's a lot faster as well. And without good investment in science communication, we just simply don't have the resources to battle this because our job is so much harder. We have to actually, look things up before we write stuff. And in the beauty space, beauty has traditionally always been, a very female space with a very largely male leadership.

And there's always just been this idea that women don't care about science. We just want pretty colors. We want, nice, sexy advertising. We don't care about what actually works and that's always been, what's assumed. And so there's just been no effort to try to explain the science to people.

And I think there's also been very vivid, historical examples where you know science hasn't been correct. And chemicals have been bad for us. Like things like lead makeup, the silent spring cigarettes that are very easy for people to bring up as counterexamples. When in reality, there are thousands of things we don't think about when it has been safe and things have been fine.

**Jess:** It's that negativity bias? Hey Michelle.

**Michelle:** Yeah definatley

**Jess:** brains preference

**Jen Novakovich:** yeah, and I was reading a study on conspiracy thinking. Firstly, the building blocks for conspiracy thinking seem to be anxiety, fear, a feeling of lacking control and the overall desire to make sense of the world. Which of course we all want to, but I feel like it's really been compounded during the pandemic where there's so much uncertainty now to uncertainty, what Michelle was just talking about. I thought it was interesting. I read a study from Germany where they found that with respect to uncertainty majority of respondents indicated a preference for open communication of science

uncertainty in the context of COVID-19. But then on social media, it doesn't really seem like that's the case.

I, I don't know. It doesn't seem like it based off of what works for algorithms. So maybe people want to hear about uncertainty, but while communicating it, especially on an online context, do more harm than good. I also had a conversation with Josh Wolrich on the podcast about a similar topic. I seem to talk about this a lot. But he chimed in to this point that nuance is sometimes the death of information because people don't want to read the context. So I'm interested in what your thoughts are there

**Nini:** yeah, I actually, so it's interesting because my approach has been a little bit different.

I actually want to present a lot of the material in terms of, uncertainty. Cause. And I always tell people like any time that you reduce the risk, another one goes up, that's just inherently the way things work. And it's actually really fascinating. I can tell that there is a big difference between the people that support my work versus other like sci-commers who are doing a lot of the Covid science communication, because I really focus on the risk assessment and presenting the information in every light especially when it comes to like vaccines, but also doing it in a way where I you know, so for instance, people are always saying, like the vaccine is really new.

And so I always try to present, like the opposite argument, which is the virus is really new. And so I use a lot of risk benefit analysis and a lot of the work that I do and it really, I have found that it really helps. I do a lot of the one-on-ones with people who are embedded in like deep conspiracy theories and that is typically the angle that I use, where I just take their argument, I'm receptive to it. And then I just flip it and present the alternative and build the risk benefit scenario. And I hear a lot online is people saying we want to have these conversations. We want to have these conversations.

Why isn't there like the debate and in a way by allowing those conversations and a lot of may feed in my comments, like people will say, what about this? What about that? And just presenting the information also within the context of the risk and the benefit, I actually have had quite a bit of success with that strategy.

So I don't know that necessarily like uncertainty is bad. I think that uncertainty, without context and with a good understanding of risk benefit can be really bad.

But that's where, a lot of the, the work goes into educating people about how to do a proper risk benefit analysis, especially when it comes to medical intervention.

**Jess:** Nini, do you think that's influenced too by the biases that they come with? What I've seen is this people that turn up in my inbox and they certainly have a very strong perspective about what the answer is that they want. and, I often do the same, so for example, if you talk about the vaccine and breastfeeding and they locked a little bit, we haven't got enough evidence and hasn't got long term and you say actually we do have evidence, but what about the risk of the virus itself as a pregnant or breastfeeding person?

We have very strong evidence that the risk is stronger, but I guess I'm just wondering around if you delineate between people that are really so far down the rabbit hole, that they don't have an interest. And how do you approach that?

**Nini:** Yeah. I mean, There's like a whole spectrum, right? There are a certainly individuals that are, more interested in information and receptive to it. And there are certainly individuals that are a lot of the people that I'm talking to right now. Cause I'm doing a lot of these one-on-ones they are not like anti-vaccine, they're actually just stuck in like these cycles of fear.

They've been like what we call the whole bounce people that have just been waiting and seeing. And so that's another category. And then of course you run into people that, already have like their beliefs and those are a lot more challenging, to to tackle. And so what I usually always do is present, I expand like the argument.

I think specifically with like vaccines some of the medical interventions, we just have a very distorted perception of it. Seth Berkley from the Gabby, he has a great quote and I love it and I always use it and he says, vaccines are a victim of their own success because when they work, we experience nothing.

We just experience the absence of disease. And so I really try to. percent that perspective and get people to think about how they would behave in other situations, because a lot of the focus is on vaccination, but I expand the argument and say do you take other drugs?

Do you take other prescription medications? Let's talk about those. Why are you not concerned about those? Why are you not concerned about something that you're eating today? Having a side effect, five years down the road. And so by

having a lot, I do a lot of that Socratic method where I ask them questions and eventually they start coming around, but those are challenging conversations. We're talking about three or four hour zoom calls sometimes to just get them to open up and get them to realize on their own end, how there is really like this cognitive distortion around vaccination.

**Jen Novakovich:** Nini. Do you have three or four hours? Zoom calls with people from social media?

**Nini:** I do.

**Jen Novakovich:** Oh my god.

**Nini:** I do, I like I struggled with anxiety like years ago, like when my mother passed and I understand where these people are and I know that there's like so much that I would be able to do online.

So I do have like ones mainly on the weekend. Like I have one every other day or so. And that's why I really, the messaging, in trying to keep it like really positive. , cause people right now that are holding out, are just stuck in fear. Like it's just a really fear response. Cause again, this is an unprecedented time, right?

We have never lived through something like this and I don't think any of us have really processed. What has happened like to us, collectively or even individually. And a lot of people are still living in fear because of course under the circumstances, they're very vulnerable to misinformation.

So the, yeah, those are like, one-on-ones, I'm tired all the time, but it's working and it's really it's rewarding.

**Jen Novakovich:** Lalita, would you like to go now?

**Lalita:** Jen. I totally forgot the questions. You're going to have to tell me the question again.

**Jen Novakovich:** So it was around communicating I guess the nuance. Research shows that people with respect to uncertainty, people want open conversations or communication around the scientific uncertainty in the context of COVID-19 specifically. So people wanted, but it seems like what's successful

seems to not be nuanced. So the question is, will communicating the uncertainty do more harm than good.

**Lalita:** I think that a lot of the times, especially in the skincare industry, when you're trying to, like Michelle mentioned earlier, it's definitely an uphill battle trying to be a science communicator online because.

There are so many people who feel so strongly about their own beliefs, that it sometimes is hard to change someone's mind and try to tell them that, and I'm speaking strictly from skincare because, that's what I know the best. So I think that from that point of view you could try and open communication.

I mean, I get so many messages on a day-to-day basis, either, refuting what I'm saying or just totally disagreeing with every single thing I post, and at some point either, you can have an open communication where you're just trying to not let your emotions get in the way and you are having an honest.

Communication about, why you think your posts is accurate. They may or may not believe you know what you have to say. I've had both, I've had people who were actually able to change their mind, but then I've also had people who just thought I was like, outright, like just saying whatever. So I think a lot of the times when we see things online, especially if an emotion, it triggers some type of emotion, that's like outrageous. In general, like when I'm sharing information, especially if I see something that is completely outrageous I try not to share it instantly because I don't want to be a source of misinformation. I, take a step back, breathe and figure out well, is this correct or not? And I try to verify it with my peers online and I try to do the same when somebody approaches me, I try to really understand, what are they asking me? And can I be, if any help with any sort.

**Jen Novakovich:** Esther, would you like to go next?

**Esther:** I don't know. I don't know if I have an answer Jen to this question. I still feel like I'm a a little bit confused on the question.

**Jen Novakovich:** Yeah. It was all over the place. So you could talk about any points brought up. Uncertainty is part of science. It seems like people want it based off of the evidence, but online that doesn't seem to work that well.

So should we be investing in communicating about the uncertainty? And then also the point about nuance and nuance being the death of information? Where's the balance for science communicators?

**Esther:** I think, yes, that'd be sh we should be investing. I'm always talking about the uncertainty more.

Excuse me. And the reason why I'm saying this is because I know that the majority of us here are like in the beauty industry. So that's like what we talk about. And the reason why I say yes is because of what happened with the recent articles with PFAS. And a lot of people were saying, oh, I have to throw out my makeup now all my makeup is bad, et cetera, et cetera. And then you made a post saying. Okay, that's, your cosmetics are safe. Yes. There are some things that we don't know about yet. Yes, the dose is what makes the poison and the more information will eventually come out that is able to answer these questions. So I think addressing uncertainties, that's super important.

I think that we definitely should be investing in it more because. Even though it's not a concrete answer. It it brings up more perspectives and that's, I think a very important aspect of science communication when it comes to finding the balance, that is blue hard for me to answer, because I don't know if there really is any balance to bounce to it.

I just feel like it's like a part of it's one of, the struggles of of of science communication because of course people want concrete answers and you can always provide that all the time.

**Jen Novakovich:** Yeah. And perhaps this is important for the whole science literacy issue where yeah, science literacy is an issue, but this is one facet that is probably important for the public to understand about how science works.

Michelle, do you want to chime in?

**Michelle:** Yeah, so I am a big believer in communicating nuance because I basically, my whole career is based on this. And I think that is actually like the secret to why I've been successful because I think trying to communicate nuance in a place where no one's ever tried communicating nuance before and people clearly want it.

When I first started I never thought I would have this many followers or that anyone would care what I would have to say, like I thought, I'll max out at like

5,000 followers and now I have what, 300, like not to brag or anything, but I think.

Oh, thank you. But I think the proof is in the numbers here, like there are 300,000 people who want something more complicated than, chemicals are bad for you. And yeah, I think I am probably like one of the top beauty influencers in Australia. And I think, yeah, that goes to show that like people have been underestimating how much the general public wants nuance and actually cares about evidence and things like that.

So I think it's quite I guess it's a bit of optimism for us. As depressing as it is sometimes facing the fact that everyone, you see these influences who are just going off with conspiracy theories and stuff. I think it is possible to make people care about nuance. It's just a lot harder, but I think it's worth it.

I think. If you don't, I think if you give people a simple narrative, that's inaccurate. Washes over nuance. I think it comes back to bite you in the ass. And I think we've seen this over and over again in the pandemic, but things like communicating about mosques and stuff like that, where if you give people a simple narrative, that's actually, a convenient lie.

Once they find out it's a lie, it's going to decrease trust and that it's not a good long-term strategy. So I think it's like everyone's been saying, I think there is big need to engage with what people are actually worried about and get to the root cause of why they're scared and really don't shy away from that and give them something like don't brush them off with something simple, but actually go to address that.

And I think a lot of this is I think a lot of us have an education background. So I think that's why we're, we tend to be quite good at being flexible with responding and actively engaging with people's concerns like ninis been during what three, how has the zoom calls with people to really try and I think, yeah, it's to do with getting to the root cause using empathy to try to understand where they're coming from so you can actually address it.

I think it is really tempting to just wash over it and just give people a simple answer that, brushes away their fears scientists saw a trade, you can trust scientists and then, walk away. But I think it is really valuable doing the stuff with doing where way we've actually, tackle the actual issue.

Yeah, so I think that's basically all I have to say, keep doing what you're doing. Try not to burn out.

**Jess:** Michelle, I just wanted to say too, that I think one of your successes is the accessibility of science. And I think that speaks to your expertise of your science communication so many years.

And all of those things that you mentioned are so important, but I think it's also the, "how" you deliver that message. And without trying to work out what your audience needs and, the tendency of science to keep things in paywalls and peer reviews and, even open access journals. They're great, but they're not necessarily accessible to the general reader.

And I think that's where science communication becomes so important because each of us here has a different nature, different approach, and there's so much benefit in different styles and different groups that we all have access to.

**Jen Novakovich:** along these lines so the science of good science communication, what works and where are we failing? And Jess, I feel like this is your direct expertise. So do you want to chime in first?

**Jess:** Yeah, I guess. there's so one of my favorite authors in this area that specifically researchers debunking is Stephen Lewandowski and he has been working in psychology for a number of years and he has published the debunking handbook and a number of other elements.

I think one of the things that we forget about is how much identity is attached to certain beliefs. And I think that's where addressing misinformation can be challenging because if you're not only challenging information as inaccurate, but it's also it's that empathy, but it's working out. Am I actually going to be turning their worldview upside down too? And so not underestimating, how can we pitch our conversations to support individuals worldviews? And I think that's where Michelle and Nini were particularly talking about understanding what is that concern or what are their core beliefs or seeking out in terms of information and how can we support that?

So if it's safety or it's, not wanting to have toxins or things like that, and how can we support their journey to achieving what's important and value to them with the way that we communicate it. I told her a lot from simulation science in the way that I have these conversations. And so part of simulation for health professionals, we put people in pressure cookers. . And then we sit down as a



group and talk about how it went, what worked well, what didn't, and a lot of that is about what we call advocacy inquiry. So we're both waiting for the individual to improve, to get better, but we're also inquiring as to what is the underpinning beliefs around why they chose certain things.

And I think we can do that a lot in online content. And that really helps with that empathy building. I've been reading up in the last few days and I'll probably have a post coming out around this idea of moral outrage. And I think on social media, it's so easy to become morally outraged because we've seen something that just undermines our beliefs.

And so then we jump on that bandwagon and I think one of the biggest challenges for us as science educators is to remove that emotion from our response

**Jen Novakovich:** Lalita would you like to go next?

**Lalita:** I think, like Jess mentioned if something online, if you're going to react out of intense feelings, then hold back. And the story that you want to react to, it will still be there after you, perhaps you verify it. And so I think that a lot of the times that when I first look at information online, what I generally do is I look at the content itself and I try to identify. Any pieces off a post, let's say that seemed too good to be true or are inconsistent perhaps with others that have that, that I have read or seen, or just seem completely just overblown dramatic and lacking some sort of specific evidence that I know is making the story false. So I think, I always just try to look at the content first and then look at the source who is posting this type of information.

But again, we have seen experts and I know I've had this conversation with some of my peers on here. We have seen experts that are the problem for misinformation in some cases, in many cases not, but, and how do you weigh that evidence and at what's scale, like how when someone, when the dermatologist with a huge platform is, making a bold statement and it's inaccurate.

That does tend to get reshared and, it grows. And the spread of misinformation just keeps growing. So I think what works and what doesn't always, fact checking can work. I would still say that it's also limited to some degree because you also have to worry about facts versus beliefs.

You can make a statement on a fact, but some people are so deeply ingrained in their beliefs and modifying beliefs is so difficult in some cases when they're so deeply ingrained. So what works and what doesn't I think like we previously talked about happy having an open conversation and open communication with the public and what we post online can be helpful.

**Jen Novakovich:** Esther, would you like to go next?

**Esther:** well, I, I can only really speak from my experience and speak from what I've seen. And I think what works has people explaining things in a very simplified way, no matter how complex that the topic the topic of science really is. And what I've also seen on social media is people making like tiny reels and doing it in a very fun, interactive way for the audience to understand And I don't want to say, how do I phrase this? I don't want to say what people do doesn't work, but I think the more complex people make science sound, I made it's complex don't get me wrong. The harder it is for a consumer to take that home and be able to understand it. And it just leaves them confused. So I think what doesn't work is people making it very complex. I think the the basis of science communication, it should be for the audience to understand what the scientist is trying to convey.

Yeah, that's what I have to say.

**Jen Novakovich:** Nini, would you like to go next?

**Nini:** Yeah, I think one of the bigger issues is that everyone just has so much access to information. You can pretty much type anything into your Google search bar to confirm your beliefs and you'll find one hit right? Something. And so I think. Part of what I've been trying to focus on.

And as far as scientific literacy is teaching people, about studies, right? The different kinds of studies, the hierarchy, the limitations of data and educating them around how to, validate the data and why the methods are important and why it's important that the person who's talking about this has the expertise.

Because again, going back to this idea of nuances, which a person that is not within a specific field may not be able to capture cause I really do see it as is the bigger problem. We all agree. It's like this uphill battle and there's just more and more information and misinformation that's, created every day, but it's it really is rooted in people cherry picking or people misinterpreting data and that's hard to combat, right? Cause they're there, there are many And so like, my focus has

really been around literacy component and teaching people how to interpret a study and to recognize their own limitation in interpreting the study. And a lot of what I'm doing right now on my platform is collaborating because I'm trying to show people that, Hey, I'm not an expert in this specific thing.

Let me team up with a virologist. Let me team up with an epistemologist. Let me team up with an infectious disease researcher to really encourage, set an example that you know that it's okay not to know everything and it's okay to reach out and ask questions. Cause I think that's also something that is happening right now.

We have a lot of these false authorities. Just making claims and that's not going to stop anytime soon. So I think it's more about teaching people how to understand what is considered evidence, and what is technically just data and what is a limitation of a specific study

**Jen Novakovich:** and last but not least, Michelle, do you want to chime in?

**Michelle:** Yeah, so I think what works like what everyone else has said, I think it's to do with going back to what's familiar to people and telling them how it might fit in with their beliefs. In beauty I think. The idea that let's say environmental impact- a lot of people are convinced that natural is better, but if you can show them that natural, isn't always better. And that sometimes synthetic better serves their beliefs. I think that's always like a good way to get them on board with what you're saying, because again, you're not radically changing their worldview, you're just telling them how to better achieve their actual goals, which I think is always an attractive option for people.

Also knowing your audience is really important, being able to pitch it at the right level. I think it's, I guess it's not really about how complex to make it, but how complex to make it that fits your audience. Because I think that's also where a lot of success from people who promote pseudoscience comes from the fact that they know their audience so well, and you know they are native users of that platform, they are their audience. And I think we could all learn a bit from that and, use social media to our advantage a bit better. And I think what Jess and Nini said about teaching audiences, how to think, I think that is probably a better way to go forward.

And it's definitely something that I should do more because yeah, information is infinite myths, perpetuate infinitely. We don't have all this time to refute every single myth. I think the longer I've been in this space, the more viral myths have

gotten, and especially with the rise of tik tok, I really feel like, the wave does not end there.

So I think, yeah, teaching people how to think, even if it's through showing them how one particular myth doesn't make sense. And they can maybe use that as an analogy for dealing with other information they come across. I think that's probably a very cost-effective use of our time.

**Jen Novakovich:** Yeah. And I guess one more question it definitely feels like we're in an uphill battle in the cosmetics space. In and outside of the cosmetics industry, there are bold headline after bold headline, sometimes from experts who seem reputable, but turn out to not really be, but the public is probably not going to understand the layers of expertise in the cosmetics industry. And I'm sure the same kind of thing can be applied to healthcare. It's pretty complicated. So I guess I was interested in your perspectives around bold headlines or what works on social media fear tends to work really well because of our bias for negative information. And then it's shared more frequently.

Bold headlines vs how can sci-comms, compete especially when we're talking about in the social media landscape, Jess, would you like to go first?

**Jess:** I actually think we can learn from both headlines and the media approach. Obviously there's some consideration of ethics and not wanting to mislead people, but I think we can learn from the ways that things are catched to grab people's attention. And even if it's just a, one-liner like I use a lot of one-liners in my posts, in the graphics, just as a way to catch people's attention.

And certainly I've noticed a difference in reels compared to posts like the attention that sometimes reels get compared to carousel posts is really interesting. But yeah, I do think we can we can actually learn from that marketing perspective and we could use that to our advantage.

**Jen Novakovich:** Nini, would you like to go next and perhaps collaboration could be so nini's content was recently shared by Ariana Grande. Is that how you say her name? Oh my gosh. Yeah, so and talking about ways to compete.

**Nini:** I don't know if you saw her post and it was actually very balanced. I don't know if you read the caption, it wasn't like it was captioned gently. She's a, this is a gentle reminder, and I liked that. I'm actually, trying a more balanced approach. Because one of the things that I really try to emphasize sometimes is

that we want to get away from like these fear cycles, because then it's harder for us to, we all know that it's harder for us to, to use our prefrontal cortex and reason and make decisions when you've got like your head, your hippocampus, your amygdala taken over that emotional response.

Just takes over the brain. And so I've actually, agree with that method where sometimes if there's misinformation, you could use that same headline, flip it back, that's a polarized as I, try to go, but I'm actually entertaining a more, balanced discussion in my feed, risk versus benefit.

And generally the feedback that I've been getting from people is that it's very common. On one end, I get people who say, you're like the only account who is not dismissing what I have to say and just telling me no, that's not true. And I think it is important because that is like what we are encountering and going back to what, Michelle said earlier that we need to meet people where they're at, whether that is by presenting something that they're familiar with, or whether that is, addressing their specific perception of risk or their concern, we really need to meet them where they're at. And if we, otherwise we're just talking to like our echo chamber. That's what I've noticed is like I could do something polarizing and yes, it's going to be steered by people that are, aligned with my beliefs.

But then is that really what I want? And know, that's like the bigger question that I always is that really what I want. And of course there's ripples what we present. Other people can take and talk to like their friends and family, but I'm trying to reach a broader audience. So I'm trying to do more balanced discussion. And I'm really surprised. Like my follower base is really strikingly different than what other like sci-commers have in the COVID space and like that health misinformation space. So that's just my perspective on it. I'm trying to stay away from too much polarization,

**Jen Novakovich:** Lalita, would you like to go next.

**Lalita:** Yeah, I was going to say, I think I have actually learned from using bold headlines when I've seen these bold headlines on Twitter and news channels everywhere. I've actually learned from that to incorporate it into my own posts, because I've seen that works for so many people. Let's see if it works for me. And if I can spread accurate information by using bold headlines and surprisingly it has worked especially I've noticed some of my posts that actually just have a bold headline, with just enough information, but not too much because people don't have, long attention spans anymore more I think they just

probably scroll and read my posts for two seconds and then just keep scrolling. So my whole strategy was in that two to five seconds. What could I post? And Jen, I actually learned from you as well, because I've seen some of your posts have bold headlines that work that get a lot of engagement that really works.

And so I was like, Hey, this seems to work and let me try to incorporate the same. So I think you and I both do utilize the strategy to some extent. And I think I try to do that to spread to try as hard as I can to spread an accurate information. But again, that only works to some extent because there are other people out there with much bigger platforms who are probably, having bold headlines for something completely opposite. So I think it's hard to say, but I know that I've actually learned for the using bold headlines and it has worked for me to some extent.

**Jen Novakovich:** Yeah. And that's obviously been part of my strategy, but I have been trying to move away, but as I move away, my content doesn't have the same reach as it would have otherwise.

And it's not just my echo chamber that I'm reaching with bolder headlines. when I have put up posts about clean beauty, I was reaching people from that community and a certain portion may be offended. Although I make sure that I stand by everything that I post about that topic.

But I think that I've changed people's minds, at least some people. And then for those other people, I feel like maybe I'm planting a seed. I don't know if what I'm doing is the best way, but that, that just seems based off of what I've done. It seems like that's what has worked best. Yeah. seconding what Lalita just said, Michelle, do you want to go next?

**Michelle:** Yeah, so I think it's not always bad to be polarizing. I think there needs to be different approaches. Like they need to be, there needs to be people who are, just mocking pseudoscience and there needs to be people who do more outrage and are gentler and have a more gentler approach, which I think is what Nini and I both do.

But I do think that gentler approach is an underserved niche. I think that it is a lot harder to do and I think. There needs to be more people who have the patience to do it. And I think it does work because you are playing to different audiences, different things, work for different people. But yeah, I think this sort of like influencing the influencers sort of niche is definitely somewhere that has a lot of growth potential. And I think a lot of success will come that way

because we need more people who aren't just preaching to the choir. I think what Jess said as well about learning marketing is really important. And I think, again, this is one of the things I think I do that a lot of science communicators don't do. I've done lots of courses on SEO and Instagram algorithms and YouTube. Where experts on YouTube tell a general audience how to try to make your YouTube channel better, learn how to look at the analytics, look at what works in thumbnails and stuff like that. And I think that's really important. I think in general, a lot of science communicators do tend to focus on the research behind science communication and not really look at how social media functions things like basic things like hashtags, but also more in-depth things like when the algorithm changes to be on top of that.

And I think that's really important because that is what the pseudoscience people are doing. They're really good at utilizing these platforms. And it's because they know how the platforms work, not just like from their own experience, but also from learning in these courses, how to use these like influencer courses.

So I highly recommend doing some of those, if you're in a particular platform and you want to really optimize your reach also networking within. Topic area as well. So I'm friends with a lot of beauty influencers who aren't beauty, science influencers. And I think that way you keep your ear to the ground and you can also see what works for them and try to take what works in those fields and apply it to science communication.

Because I think we all know science communication isn't working as well as it could. And I think this sort of cross-fertilization is a really good way of getting things that work. So what Esther was saying as well with tapping into things that are trending. And yeah, looking outside of just what science communication does and looking at what works in other areas.

And I think one thing that we haven't quite mentioned, but I think we all think this is more funding would be great. So I think being able to demonstrate that science communication was, I think all of us are engaged in that, but also just demanding more funding because. This stuff takes time. It's really difficult to fund it.

I think us in beauty, we've managed to find a niche where there is a lot of potential for getting commercial funding. I am largely like my platform is largely just funneling commercial money into education. But it's a lot harder. I

can't imagine how you guys in the COVID like health niche how funding would even-

**Nini:** interesting. It's interesting. You mentioned that cause I'm actually hosting a panel discussion in September around what companies can do. you know, This is a public health crisis and it's going to cost. Public health and it's going to cost companies, right? If there's an outbreak at a meat factory, that has a direct cost to a company. So, this is part of what we're going to hopefully be discussing is, is this something that companies could potentially fund? is it something that public health should be funding.

Cause I think communities, especially now here in the U S they're recognizing like the real financial impact of it. I'm actually optimistic for it. I really do think there is going to be more funding opportunities because it is really such a public health threat and it has such a high cost.

**Michelle:** That's really good to hear. That's definitely happening in beauty as well. So I've been in talks with a lot of large ingredient manufacturers actually, who are concerned about the wider impacts of pseudoscience. So I think, yeah it's really good that there is this wider realization that pseudoscience does have actual commercial impacts because, capitalism, you have to somehow make it relevant to their bottom line. But yeah, I mean it does, it has these massive impacts.

Yeah Absolutely.

**Jen Novakovich:** I feel like I could talk to you guys all night about this topic. We're already over time. So I'll just ask one more question, which is do you have any final take-homes that you'd like to leave our listeners with Lalita, would you like to go first?

**Lalita:** Yeah, I think for me, my, my take home would be, you obviously don't want to believe.

Everything you see or read, but at the same time, you don't want to uncritically disbelieve everything because that's also, I don't think a good strategy to go off of. I think some news sources are definitely more consistently accurate than others. Some expert opinions, are more trustworthy than others.

And I think the goal here, isn't always to identify why something may be wrong, but it's to more so identify how does the story work? You know what parts are



complicated and subjective? What parts are probably more accurate and how much of that should really change your opinion or behavior. And if it really does change your opinion, maybe that's when you should really speak on it. And I also think that scientists should get out there on the frontline if they are comfortable doing so and play a role in fighting misinformation because I don't think we're anywhere close to achieving what we really want to achieve. But I think if all of us come together and take part in science communication, we can make a difference.

**Jen Novakovich:** Esther, would you like to go next?

**Esther:** Yeah. So this is like a just like a general comment too. I guess I grew up watching the consumers, but the one thing is that you're not gonna always have answers to things uncertainty isn't always a bad thing. And you're not always going to have answers to all of your questions and going off of what Lalita said. I would also say that, yes, we need more sci-commers. Unfortunately there's going to be a lot of fear and misinformation, like all the time. And everyone has said earlier in the conversation, it is that it really is an uphill battle.

You can be at least take one step forward by doing science communication. And then there's a million, more people spreading misinformation about COVID, beauty, et cetera. So the more people we have doing this, the better it will be. And Even if you don't think that you're making an impact for me, I didn't think I was making one, but people will actually be very thankful by you offering different perspectives, especially with science communication.

So the more, the better it's pretty much what I'm trying to say.

**Jen Novakovich:** Michelle, would you like to go next?

**Michelle:** I think my advice for, more science communicators is just experiment with what works. Don't be afraid to be creative. I think being creative is really important in the science communication space. Be creative, look at what your analytics tell you what's working.

Once you've worked out, what's working stick with that. If it stops working, then, change it up don't be afraid to evolve because that's what. I guess the other side the people who are pushing pseudoscience are doing and doing extremely

well. So I think, yeah, make sure you actually learn from them and don't just try to stay in the ivory tower, I guess.

**Jen Novakovich:** Nini would you like to go next?

**Nini:** Yeah, I just wanted to add, and I think this goes back to what we were discussing earlier that I think it is important to know as much as we do all that we do on social media also do like community outreach work because that also has ripples. And I did talk about funding that's really where like your funding could be.

In fact, that's actually what I'm also exploring on the side. I do think that it's something that is, with what we're seeing with, especially with COVID and misinformation. I think it's pretty crystal clear. We have a misinformation issue that affects us all. And I think it's important that as much as we do the work online, we all should.

We also remain connected so like our local communities and do work there because you'd be surprised you could get like that funding. You could get a sponsorship, you could get connections that will be extremely helpful to grow your platform. So that's just one other thing that I wanted to add.

**Jen Novakovich:** And last but not least Jess?

**Jess:** So in health care, we have the saying, just because you're a clinician doesn't mean you'll be a good educator. And I think the same goes for science communications, just because you're a scientist doesn't mean that you'll be a good sci-commer. And that in itself is a unique skill that needs development both from a communication perspective, but also that marketing perspective that Michelle was talking about.

So I would, recommend for anyone that's interested in pursuing that to really think about the training that they might need to look at the decades of research, backing science communications, and then bringing in that marketing expertise in social media development as a key part of your professional development.

**Jen Novakovich:** So however you interact with science communication I hope this conversation has shed some light on why we do what we do. It's not clear at this point whether we are making a dent but we're throwing everything at the wall and seeing what sticks. Our test wall for the upcoming year is going to be our discord server. This episode aired live over there and We're excited by the

amount of flexibility that platform gives us to bring you interactive content. If you're not already a member please consider checking it out. It's free to join and we're hoping to bring some serious value to that place over the coming year. If you appreciate what we do and are looking for ways to support the show please consider checking us out over at [patreon.com/theecowell](https://patreon.com/theecowell). Huge thank you to all of our supporters over there. You guys keep us producing content and we cant tell you how much your support means to us. Massive shout out to JGP, Maya and Sara for going for the full spa treatment, you guys are amazing. Big thanks to our panelists for their time on the show today. This is the last episode of the year so also big thanks to you for tuning in.