Mind & Life Podcast Transcript
Quinn Conklin – Mind-Body Connection

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Opening Quote – Quinn Conklin (00:00:04): *On a retreat, there's often a ritual where people adopt these guidelines from the Buddhist tradition for the course of the retreat. And I think that these guidelines, along with the noble silence, create this context where people can be close to other people while also creating a space that is potentially psychologically safe, physically safe, socially safe. And I think safety is one of the really key elements for these restorative processes and being able to allocate your attention to your mental terrain.*

Intro – Wendy Hasenkamp (00:00:45): Welcome to Mind & Life. I'm Wendy Hasenkamp. Today I'm speaking with health psychology and meditation researcher, Quinn Conklin. Quinn's work focuses on the way our minds and bodies are interconnected, and how meditation affects biomarkers of health and well-being. Specifically, Quinn has been studying these effects in people who are on a month-long meditation retreat. And so we get into details of what those retreats are like and the unique benefits and challenges of studying meditation in that context. Then Quinn describes some of the biological systems she's been studying. The first is telomeres, which are a cellular marker of stress and aging. And the second is oxytocin, which you may know about in the context of forming relational bonds between people. But it turns out that oxytocin is a much more complicated molecule than that. Quinn brings us up to speed on the subtleties of these systems and how they interweave with our psychological experience and well-being, and how meditation might be impacting all this.

(00:01:57) We also talk about some of Quinn's efforts towards community-engaged research, and what she's been learning about making contemplative research more inclusive. She also shares some creative ways she's been making her research findings more accessible to the public—and to participants themselves. She's actually developed a really cool data visualization app that's available for anyone to explore; there's a link to it in the show notes if you want to dig in, you can check that out.

(00:02:27) I've loved watching Quinn's career develop over the years—I've connected with her often at our Summer Research Institutes—and I've always been really impressed with not only her depth of knowledge, but also her thoughtfulness about the nuance of this work. I really hope you enjoy this one. It's a pleasure to share with you Quinn Conklin.

Wendy Hasenkamp (00:02:50): Hi, Quinn. It's really great to have you on the show. Welcome.

Quinn Conklin (00:02:53): Thank you. It's so great to be here.

Wendy Hasenkamp (00:02:56): I always love to start with a little bit of background from the guests, as I think you know. So for you, I'm really curious how you got into psychology and mind-body connections and meditation.

Quinn Conklin (00:03:08): Yeah. So I am originally from Madison, Wisconsin and ended up growing up in northern California, in a tiny community in the woods with folks who were in an intentional community at a hot springs resort. So there were people coming from all over the world practicing all kinds of different traditions. And seeing that from an early age, I think I have always been curious about different ways of existing in the world, and how people go about those things. I also went to spend a lot of time with my dad and stepmom in Florida and then ended up going to school in Vermont. And so throughout my life I've had this circuit of different little worlds that I have existed in. And so I think that has been one of my motivations for understanding people and how they exist in these different contexts, have different mindsets, different intentions, different ideologies. And then also seeing myself move through those different spheres, and who I become or how I behave in the different contexts that I've been exposed to.

(00:04:31) So when I went off to college in Vermont, I studied biology primarily, but I also got minors in psychology and chemistry and English. I was really interested in trying to integrate psychology and biology, and I initially thought that would be neuroscience, but in looking at neuroscience grad programs, I wasn't finding that spark of what it was that I was really interested in.

Wendy Hasenkamp (00:05:03): Can you say a little bit about what it was that you were really interested in?

Quinn Conklin (00:05:08): I don't think I had clarity at that point about what I was interested in, but what I was finding was not that. I was finding a lot of EEG work and fMRI, and partly those were things that I didn't think I really had the background to do well in, but it also just didn't spark that interest for me. And so I was seeking out other ways of integrating this interest in how our minds influence particularly our physical health.

(00:05:42) And I also as an undergrad did a stint in plant research, and that has really come back to me many times because... It was plant flowering, so plant reproduction. And plants have to really rely on signals from their environment to decide when it's time to reproduce. So things like daylight, season, temperature, and they have to happen in a particular order to signal this for the plants. And so that has really shaped, at least in part how I think about living organisms existing in their environment, and how we're encoding information about the environment and using that to make decisions about how we behave in the world.

(00:06:31) So after college I did an internship in New Zealand, again in a cognitive neuroscience lab. And in that experience I was more or less in the basement of a psych program, and told to go figure out these fMRI scans. And didn't have a lot of success at that point. *[laughter]* But that was also where I took my first meditation class. And I don't remember a ton about that experience other than really having this experience of peace. And that was in a period of upheaval and personal distress. So that was really salient to me.

(00:07:16) But then I ended up back in Madison after that and during that stint I was training in Pilates and yoga and dance, and really getting into embodied experiences. And I was also waiting tables to pay my rent and volunteering in Richie Davidson's lab. So that was another avenue for getting some more

exposure to this field and really gaining an interest in it. And then through the waiting tables, I got a position at the National Science Foundation.

Wendy Hasenkamp (00:07:52): Through waiting tables?

Quinn Conklin (00:07:54): Through one of the co-workers that I worked with. Her sister was leaving a position at the National Science Foundation and she said, "Hey, I think this might be something you'd be really interested in. You should check it out." And it was a science assistant position, so you essentially support the funding programs. And so I was assigned to Science Technology Studies. And in that position, they gave you a little stipend to pursue your own interests, because this position was particularly designed for people potentially pre-graduate school. So they were really trying to help people figure out what those interests would be. And what I used that for was to attend the 2012 *International Symposium for Contemplative Studies.*

Wendy Hasenkamp (00:08:42): In Denver?

Quinn Conklin (00:08:43): In Denver, yes. And like many people in this field, my advisor in that position was like, "Are you sure this is what you want to use it for? Okay. I mean, if that's what you want to do, great, but maybe you should also go to a 'real' science conference at some point." But it was exactly the thing that I was most interested in doing. And by happenstance only a month or two before that meeting, I was helping to support a panel that Cliff Saron, my now PhD mentor was involved in. And I had also run across Chivon Powers, who became one of my lab mates several years later, but her advisor was on a panel and I had introduced myself to him and mentioned that I was interested in meditation research. And he turned around and said, "Hey, if you're interested in meditation research, you should talk to that guy." And that was Cliff.

(00:09:47) So that was my first exposure to Cliff, though at that point I was still pretty shy and didn't spark up a huge conversation with him, but I went and researched who he was. And then right before the meeting in Denver is when I reached out to him and set up a meeting with him in Denver. And that is where I met all of my now longtime collaborators, lab mates, friends in that first meeting and exposure to this whole world.

Wendy Hasenkamp (00:10:16): Wow, I love hearing that story. There's so many twists and turns, and interesting unexpected connections.

Quinn Conklin (00:10:22): Yeah, it's definitely been a road of a little bit of seeking and a lot of happenstance, and connections and introductions along the way.

Wendy Hasenkamp (00:10:31): That's great. And you ended that story with joining Cliff's lab and research, so I'd love to pick it up there. And I know a lot of the work out of that lab and the work that you've done has focused on studying long-term meditation retreats, which is a really specific context with, I would imagine, a lot of unique challenges and advantages for research. So I'd love it if you could share a little bit about maybe even just what a retreat is like, for those listeners who haven't attended a meditation retreat, and then how that integrates with the research dynamic.

Quinn Conklin (00:11:08): Yeah. I will start by saying there are, just like there's many different types of meditation, there are also many different formats of retreat. And the retreats that I have had the most exposure to, both in my research world and in my own personal practice, come from the Theravadan meditation tradition—and particularly the Insight lineage as it has manifested mostly at Spirit Rock,

which is a meditation center in Marin, in California. So I myself have done maybe between 7 and 10 retreats there. And that is where most of my research has been about one of the month-long retreats that happened at Spirit Rock as well.

(00:11:56) So a retreat (again in this particular style) usually involves living on-site at a residential retreat center with fellow practitioners. So in this case, those retreats often have between 80 and 100 other meditation practitioners living there on-site. They're led usually by a team of meditation teachers. And they're often conducted in what is called noble silence. So people will often take a vow of silence throughout the retreat, where they are not only refraining from things like engaging in email and phones and the kind of electronic world, but they're also renouncing verbal communication. People are not speaking. And the idea is to really let people focus on their own internal experience, and not to try and engage people in the more normative kinds of social interaction that we generally engage in throughout our day.

(00:13:02) Retreats also involve a really regular schedule. So again, in these retreats, there's about 11 hours of practice scheduled throughout the day. And that doesn't mean that everyone does all of that, but the schedule generally consists of alternating periods of sitting and walking meditation in about 30- to 45-minute segments throughout the whole day. And then these meals that are provided, and those are also taken in silence. So that's the kind of general layout of it. Is there any more specifics you want to talk about?

Wendy Hasenkamp (00:13:38): No, no, that's great. I think it's helpful to just reflect on the extremely unusual context that is created on a retreat, particularly those held in silence, and then what that might mean for research outcomes and other things.

Quinn Conklin (00:13:54): Yeah. And I think that they do pose, again, some really unique advantages for studying meditation, and also some real challenges for trying to approach them in the kind of scientific framework that we also like to use. And so some of the advantages are the really high dose of meditation. I think that is particularly one of the things that Cliff was oriented toward in his early work. So we probably won't get too much into the Shamatha Project, but the basis of his work and some of what attracted me to it was the three-month retreats that he conducted in Colorado years ago. And I think some of the rationale there is that a lot of the changes that we might see due to meditation practice are probably relatively subtle. And so it might take a lot of practice to start to see observable, measurable effects. At least that was, I think, some of the thinking that motivated this line. I've also been told that that retreat was intended to be a year-long retreat in the beginning, and reviewers said, "That's absolutely insane." So it got cut down to three months. And then the retreat that I have studied the most was one month. So that's one of the advantages.

(00:15:22) It's also a really constrained environment. So people are again living on-site, more or less eating the same food, following this consistent routine. And so it's a really intensive intervention. And some of the challenges then with studying those are designing a control condition that even comes close to approximating that. That's really challenging because in order to... It's pretty much impossible to design a month-long intervention that would match some of those critical components. Or at least no one's done it yet. I have fantasies around how to potentially do that. *[laughter]*

Wendy Hasenkamp (00:16:07): Yeah, I remember, I think, when I was speaking to Elissa Epel, didn't she do some study about a vacation comparison? Which sounded very cool.

Quinn Conklin (00:16:15): Elissa is the only one. So yes, another mentor of mine, she is the only one that's managed to have a controlled retreat as far as I know. And yes, there was a vacation control done in the same location that the retreat was. So people were there in the same environment, eating the same food, and engaging in other sorts of leisure activities. So there were some classes. I think that's one of the advantages of studying maybe the shorter retreats is that you have a little more leeway there. But convincing people to take a month out of their life is a very specific thing that people have to be motivated to do, and willing to do.

Wendy Hasenkamp (00:16:59): Yes. And have the resources to do.

Quinn Conklin (00:17:01): Exactly. So that's exactly what I was just going to say is that it also really constrains the population you can study. Because in order for people to do that, one, retreats are expensive generally, but even if you can get around the cost of the actual retreat, the ability to take that amount of time out of your life and to let go of work responsibilities or caregiving or family ties, that's a pretty big ask of people. And so it really limits the population who are able to do that.

(00:17:36) – *musical interlude* –

Wendy Hasenkamp (00:17:52): I wonder, and I don't want to get too sidetracked but, it's always struck me too that the people who are very drawn to meditation, or particularly retreats, tend to more be introverts, and people who really enjoy silence and maybe aren't disturbed as much by a lack of social contact. So I wonder just if there's ever been studies on those aspects of people who attend retreat versus a general population.

Quinn Conklin (00:18:18): That's such a great question, and it does lead beautifully into some of our findings, but I will also say not to my knowledge have we really looked at who's the population of people who do retreats. I think that's actually a question we could potentially start to get at in our latest study. So in our Contemplative Coping during COVID study, we did get several hundred people who were interested in meditation and get a really rich background around what kinds of meditation they had done, and if they'd done retreats or not. And I would say about half of that population has been on a retreat and half hasn't. And so we could start to look at that question there and see who are the folks that are more drawn to that.

(00:19:09) But what that reminds me of is that... So, the majority of my work has looked at different biological markers that we measure in blood—specifically related to stress processes and potentially affiliative processes, social processes. So the two that I'm thinking of at the moment are our telomere work and our oxytocin work. And in both of those cases, people's personality measures actually predict who changes in those markers. So "openness to experience" is one of the primary predictors of both the increases we see in telomere length and the reductions that we see in oxytocin during the retreat period.

Wendy Hasenkamp (00:20:02): Interesting.

Quinn Conklin (00:20:03): And with telomeres specifically, we saw that people who are higher in neuroticism to begin with, at the beginning of the retreat, and lower in agreeableness show the largest changes in the telomere measures.

Wendy Hasenkamp (00:20:19): Oh, that's fascinating. I'm wondering whether, before we get too far down that road, could you give a little intro or background on telomeres and what they are and why you were interested in studying them? And then we can also do the same for oxytocin.

Quinn Conklin (00:20:34): So telomeres are the caps at the ends of our chromosomes. So they're made up of these repetitive sequences of DNA, and they act as buffers that protect our coding regions of DNA—the genetic material that really is the blueprint for all of the proteins that make up our bodies. And so one of the reasons that telomeres seem to exist is to protect that coding region of DNA during cell division. So many forms of our cells are undergoing constant division and cellular replication. And so when that process happens, the cell, while it's being copied, there's a piece of that DNA where the machinery that does the copying needs to attach, basically. And that piece at the end of the chromosome doesn't quite get replicated all the way. So what that means is that over time, the telomeres get incrementally shorter.

(00:21:43) So they're considered a marker of aging, but there's also a whole body of research pioneered by Elissa Epel that indicates that stress, particularly psychological stress and in her work, caregiving stress, tends to be related to shorter telomeres or accelerated shortening. And there's also an enzyme called telomerase, which is able to repair telomeres in particular tissues and during certain stages of life. And so one of the reasons I got into this work is that the paper that really attracted me to Cliff's lab was one of those papers from the Shamata project where they were looking at the enzyme telomerase and found that after this three-month retreat, the retreat practitioners had higher levels of telomerase than this waitlist control group.

Wendy Hasenkamp (00:22:41): And that suggests that there's more repair maybe happening?

Quinn Conklin (00:22:45): Potentially. I think that was the interpretation of that. Since then, I have learned that telomerase can also be upregulated in a much more quick timeframe than we might have thought. And so there are studies of psychosocial stressors in a lab (the Trier Social Stress Test) that show that telomerase can actually get upregulated in under an hour. And so I think this just makes the story more complex and nuanced, and it's possible that telomerase might actually be a signal of stress, but in that vein toward more reparative... You know, under stress, you need more reparative processes.

Wendy Hasenkamp (00:23:32): Right. Like an adaptive response to stress.

Quinn Conklin (00:23:35): Yeah.

Wendy Hasenkamp (00:23:35): Can I ask one other question about telomeres? This just occurred to me, I had never really thought about it this way, but you were mentioning the role of cell division in the shortening, which makes sense. The more times that the DNA is replicated, it gets shorter. And so is there a difference in cell types that don't replicate as often? I'm thinking of brain tissue, neurons are much less likely to undergo cell division than liver cells, for example.

Quinn Conklin (00:24:03): Yes, so that's a really critical point because most of the work measuring telomeres in humans is done in blood, and ideally, you actually separate the blood cells because different types of cells in the blood, particularly immune cells actually can have different length telomeres. And red blood cells don't have a nucleus in humans, and so they don't have telomeres. And the immune cells are, without getting too far into this, there are many different kinds of immune cells and they replicate at different rates. And so yes, the immune system is one particular tissue type that

does express this replication, whereas things like skeletal muscle or brain tissue might have these different rates of replication or division, or just not replicate or divide at all.

(00:25:02) The other caveat I will mention in this vein, because again, it is something I learned throughout this research, and I think it's one of the things that makes the telomere work both really interesting and really complicated from a measurement standpoint, is that each cell has 23 chromosomes with 46 ends, and that means it has 92 telomeres, and those telomeres can have different lengths.

Wendy Hasenkamp (00:25:32): Right. Oh, wow.

Quinn Conklin (00:25:33): And it is the shortest telomere of those 92 in a cell, which might be signaling cellular senescence.

Wendy Hasenkamp (00:25:43): Aha, which means cell death or aging.

Quinn Conklin (00:25:46): Yeah. One of the functions of telomeres is to signal to the cell when it gets to a certain shortness that it's time for that cell to stop replicating. And so that's what we call cellular senescence. And so it's not necessarily cell death, but it arrests the separation of those cells.

Wendy Hasenkamp (00:26:09): Okay. So it's more just like a stasis mode?

Quinn Conklin (00:26:11): Yeah. Because once the telomeres are too short, that puts the rest of the genetic code in jeopardy of mutations, and you don't want to be replicating mutated cells because that can lead to things like cancer. So this cell arrest function is one of the critical functions of telomeres. So that's all just to say that it's actually pretty hard to get at the signaling component of telomeres in human studies. And so we have a little bit of work to do yet to figure out the best way of measuring this system.

Wendy Hasenkamp (00:26:51): So in general, is it still accurate to say that overall, a shortening of telomeres is associated with many kinds of negative outcomes?

Quinn Conklin (00:27:03): Yes. So shorter telomeres do tend to predict earlier mortality and to be related to a lot of illnesses and diseases of aging—things like cardiovascular disease, cancer, various different disorders.

Wendy Hasenkamp (00:27:25): Another question that comes up is stress. And I know you've also done a lot of thinking about stress in your work, and does stress lead to an increase in replication rate for cell types that would divide? I mean, is that part of why stress might be leading to shorter telomeres, which might then be indicating all of these other potentially negative outcomes. Or things like inflammation, or all those bigger picture insults I guess that can happen, does that lead to greater cell replication?

Quinn Conklin (00:27:57): Right. I think that that is definitely part of the theoretical idea, the framework that we're testing, and there's a lot of steps in that process. But if we think specifically about telomeres, and even more so in the immune system, yes. So our psychosocial experience and our psychological stress levels can affect our immune system, as do physiological stressors and pathogen exposures. And so one of the reasons our psychological stress can affect our immune system is to prepare us for potential threats and exposures. So some of Steve Cole's work has suggested that loneliness can be related to the expression of antiviral immune profiles versus antibacterial immune profiles. So if people

are more lonely, that might indicate that they have less contact with humans and therefore would be more maybe subject to injury or dying from something like a bacterial infection, or exposure to a bacterial infection. Whereas if you are interacting with more people, you might be more likely to be exposed to viral illness or exposure.

Wendy Hasenkamp (00:29:34): Yeah, interesting.

Quinn Conklin (00:29:35): And so the immune system's job is to create the cells needed to respond to the threats that you will be exposed to—so to predict and/or be ready to respond to a pathogen and an exposure. So the short answer is yes, I think that stress exposure can lead to more cell proliferation.

(00:30:05) And the opposite might also be true. So in some of Elissa Epel's work and their more recent paper led by Alexandra Crosswell, they propose a model called the deep rest model. And in that model, they talk both about restorative states like sleep, but also contemplative practices and the states that might be generated by contemplative practices. And the idea is that maybe spending more time in these restorative states also promotes more reparative, restorative biological processes.

Wendy Hasenkamp (00:30:41): Right. Are you saying that that could also involve more cell division as a form of repair, or what did you mean?

Quinn Conklin (00:30:48): So that's actually a good question. That might be possible, but it might also be possible that the energetic resources that would go toward this cellular division might go towards things like DNA repair, and the upregulation of telomerase, or sort of the opposite kinds of processes. But all of those things are happening all the time in our bodies. And so being able to really parse those things apart is challenging.

Wendy Hasenkamp (00:31:22): Yeah. I'm also thinking back to the context of retreat that we were talking about and how, in addition to the meditation and the potential stress reduction or physiological changes that might come from that, there's also just that context of removing so much external stimulation, even social interaction. You don't have to really plan or think about much in your day. Your food is prepared, you know where to go when. And so there's, in my own experience, there's so much more energy that is available that we are always spending on all of these day-to-day things that we do. And at a certain point that becomes very palpable that there's much more available energy resources for your body and your mind. That's just a fascinating experience, but I'm thinking also how that plays into these things like cellular repair or stress responses on a basic cellular and DNA level.

Quinn Conklin (00:32:23): Yeah. So that makes me want to say many different things. So I'll start with, absolutely, I think the structure of a retreat and having your basic needs provided for is one of the critical components of the restorative effects of retreat. And another thing I'll say is that in writing the limitations sections and responding to reviewers for every one of these papers we've ever written, they always want to know, how do you know it's the meditation doing this and not the vegetarian meals that are being provided, or the fact that people can sleep more, and that basically they're just taking a vacation for a month? Which I do think that meditation training can go a long way towards reducing stress or changing our responses to stress. But I will also say that I don't think retreats are uniformly pleasant for people.

Wendy Hasenkamp (00:33:25): Right, that's for sure.

Quinn Conklin (00:33:26): They can be fairly stressful or distressing when you are left to your own mental devices and not able to really engage in some of the forms of distraction or other sorts of regulation that we might typically engage in our normal day-to-day. And the other thing that I've been more and more convinced of over the years is that retreats are really intentionally designed to support the meditation practice, but I'm less and less interested in this division between the meditation and these other components because I think they're really intended to support each other.

(00:34:14) And so one of the ways that I think about that, or an example that I think is relatively straightforward is that if you are paying more attention to how you eat or what you're eating, you're probably going to eat slower. You might not overeat, and then you might avoid some uncomfortable physical sensations. You might feel a little better because you haven't overeaten or lost track of how much you're eating. You're just really more attuned to what you're putting in your body, and that can lead to less discomfort and physical sensations that could distract you from other mental processes.

(00:34:59) And the social engagement piece, I think it's pretty powerful that people are on retreat with maybe 100 other people who share the same motivation and intention to practice meditation and have agreed to these rules of engagement, so to speak, that we're all here doing this thing. And that can really support your motivation and following the schedule to do the thing, because you know that 100 other people are going to show up at that sit, and it can be quite motivating to do that.

(00:35:35) And I've also started to think more and more about the precepts and the role that they play in creating a safe space. So the precepts are a set of guidelines from the Buddhist tradition that, well, I'll say what they are, and then I can talk a little bit about how I think those function in a useful way. But the precepts are refraining from taking life, so not killing. Refraining from taking what is not given. So another way of saying that is not stealing. Refraining from misuse of the senses, and that can be not having too much sensual pleasure. So one of the ways that that can be interpreted is not engaging in sexual conduct or activity. There are many ways to parse that and interpret that. Another one is refraining from wrong speech or lying or harsh speech. And then the last is refraining from intoxicants that cloud the mind.

(00:36:38) So on a retreat, there's often a ritual at the beginning of the retreat where people adopt these guidelines for the course of the retreat, and in some cases there's up to eight precepts or more precepts. But these are the typical five that I've seen. And I think that these, along with the noble silence, create this context where people can be close to other people and engage in some of the things that can be really regulating and supportive about social interactions while also creating a space that is potentially psychologically safe, physically safe, socially safe. So removing a lot of opportunity for some of these mental afflictions, so to speak. And I think safety is one of the really key elements for these restorative processes and being able to allocate your attention to your mental terrain.

Wendy Hasenkamp (00:37:41): I love that you're bringing up that safety aspect. Increasingly, I've been thinking about safety just as a fundamental ingredient, almost, for healing in many ways. So that's great.

Quinn Conklin (00:37:55): Yeah, I completely agree.

(00:37:55) – *musical interlude* –

Wendy Hasenkamp (00:38:15): You were also just bringing up a really interesting lens on social connection on a retreat, which I think for many people might sound strange given that you're completely in silence and you're not talking to people. So how do you have social connection? But I

really appreciate your bringing up just being in a space with people who have agreed to the same guidelines and have a similar motivation, and everybody is wanting the best for everybody else there. And also potentially it's much less complicated without speech. So that makes me think of your work then on oxytocin, which is really related to interactive and relational processes in our bodies. So can you share a little bit about that work?

Quinn Conklin (00:38:59): Yeah, yeah. And I will also just say, I think that ties really back into who goes on retreat, and who wants to go on a silent retreat and benefits from that. And so we can maybe spend a little time there, but it ties really into this oxytocin story, and how I think about this. So oxytocin is a hormone that functions in the brain and the body, and it's really well known for its involvement in prosocial behavior. So first discovered in maternal bonding, so it's released during birth and lactation and seems to play a really critical role in maternal bonding, but also parental bonding and potentially also in adult romantic relationships and different kinds of bonds. So that's one of the reasons it has been a real interest for people. And it also seems to play a role in stress processes; so it seems that it can reduce experiences of anxiety and distress. But again, it's one of these really complex biomarkers that plays a lot of different roles in the body.

(00:40:19) And so we measured it in this month-long retreat—in circulating blood, so we can't say a whole lot about how it's functioning in the brain—but we measured it with the idea that it might increase with meditation practice. Because meditation practice presumably increases prosocial behavior and reduces stress, so maybe oxytocin is one of the mediators of this. So we more or less expected to see an increase in oxytocin, and what we see across three weeks of this month-long silent retreat is a decrease in oxytocin. And it's one of the first things I ever looked at. And then I spent years trying to understand how we're measuring it and did we do a good job...

Wendy Hasenkamp (00:41:11): Thinking that you might be wrong with the finding?

Quinn Conklin (00:41:14): Yeah. So there's been some controversy in the field about how to measure oxytocin in circulation, and do the kits we used to measure that really do a good job? And so I bring that up just to say that I am not 100% convinced that our finding is the strongest fining or the most reliable data, but what it does for me is just provoke all these really interesting questions that I think are worth following up.

(00:41:43): So in the almost decades since I first looked at these data, there have been many developments in the theories around oxytocin and what it's doing in social species, specifically. And so when I went to finally write these data up, I found no less than six different theoretical frameworks for what oxytocin does in the body. And interpreting our findings through each of those lenses is really fascinating.

(00:42:16) So the initial kind of framework was that oxytocin promotes these prosocial behaviors, and then work from people like Carsten De Dreu started to show that that's really context specific. And in some cases, oxytocin can actually promote aggression, or this distinction between in-group and out-group people. So from that point of view, which actually makes a lot of sense if we think about things like maternal aggression—so oxytocin can promote warm feelings between a mom and her offspring, but it can also then promote defensive behaviors in order to protect that offspring. So it is helping to maybe distinguish these social cues about when to be prosocial and when to be aggressive.

(00:43:08) And then beyond that work, another group proposed what's called the social salience hypothesis. And so consistent with the in-group out-group hypothesis, they're proposing that oxytocin

regulates our attention to social cues. And so if we think about a decrease in oxytocin on a month-long retreat from either of those points of view, on the one hand from the in-group and out-group perspective, I think that could potentially mean that a reduction in oxytocin might be reducing the barriers to thinking about people as "like us" or "different from us." So one of the motivations for practice, and one of the sets of practices that people engaged in in this retreat, are called the Four Immeasurables. And so those being lovingkindness, compassion, empathetic joy, and equanimity. And often those are taught starting with the self and then expanding out to others that are easier to generate those feelings for, and then also eventually working your way through difficult beings, people that it might be hard to generate those feelings for, and then all sentient beings. And so if oxytocin exaggerates this distinction between in-group and out-group, that might actually be a barrier to being able to generate those positive emotions for people we determine as more distant from ourselves.

Wendy Hasenkamp (00:44:50): Right. Right.

Quinn Conklin (00:44:51): If we think about the social salience side of things, and we think about the unique social context of a retreat, then we have dramatically reduced the normal styles of social engagement. So vocalization, communication, talking, eye contact, sexual behavior, and these are all things that turn out to promote oxytocin release. So that might be another thing that's happening on these silent retreats is that we are reducing a lot of the behaviors that are promoting oxytocin release. And so maybe that's what's happening. Another feature of the retreat and the precepts and the safety side of things is that maybe people are able to spend less time and energy encoding social cues and paying attention to these social cues because we've set up the container in such a way that that's not so necessary for going about their day.

Wendy Hasenkamp (00:45:55): Right. So maybe you don't need so much oxytocin to help with that.

Quinn Conklin (00:46:00): And I apologize for how much I have to say about this, but there are two more theories *[laughter]* that I also find really interesting, if we think about the goals of practice and what it is that is intended with some of these practices. So another group took the social salience hypothesis and said, "Well actually, oxytocin seems to predict approach and avoidance behavior, independent of whether the stimulus is social." And so if we think about it from that lens, one of the things that happens during particularly Vipassana or Insight meditation is to observe your responses to phenomena, particularly what might be called clinging or aversion, and not to follow those impulses as much. So if you have a thought you really want to avoid, you might just let that be and see how long that lasts. So you may experience hunger, and rather than getting up and going to get something to eat, you just watch how long that sensation lasts, and maybe it's only a couple of minutes, or maybe it lasts the full 45 minutes until the lunch bell rings. But you're potentially changing your relationship to those initial impulses.

Wendy Hasenkamp (00:47:23): Yeah. Like a quick behavioral response to signal.

Quinn Conklin (00:47:27): And so from that view, if we're down regulating oxytocin, maybe that is consistent with less of this approach/avoidance behavior, and just settling.

(00:47:42) And then the very last and most recent theory, which I think actually kind of stitches this all together, is that oxytocin is an allostatic modulator. So allostasis, similar to homeostasis, is the body's way of maintaining stability through change. So homeostasis represents this idea that, say for example, we are in a cold environment, our body will regulate by increasing our temperature to keep us at a stable temperature to support our biological functions. Allostasis extends that idea to incorporate the

idea that we can actually predict the environments we're going to end up in. So we're not just responding to changes in the environment, but we can actually predict. So if we eat breakfast at the same time every day, our body will start to produce those digestive enzymes before we actually begin to eat breakfast, because it knows this is time for breakfast.

Wendy Hasenkamp (00:48:49): And that makes things more efficient?

Quinn Conklin (00:48:50): Yeah, exactly. So oxytocin has been linked to many of these physiological processes, and in this framework, it situates the social relevance of oxytocin by saying, humans are really socially motivated creatures who have to understand our role in our social environments. And so that's one of the ways that we regulate ourselves. So we share resources. We live in community with one another. And so those social cues are really important to our overall survival and prediction mechanisms. And if you think of our decrease in oxytocin from that lens, particularly in this retreat context where now things are relatively predictable—we've constrained the environment in such a way that the meals are happening at the same time every day, you know what meditation is happening, you're not going to end up having a weird conversation with the person you sit down next to—then there's much less predicting that we need to be doing. So I just had a lot of fun thinking through all those different possibilities writing that paper.

Wendy Hasenkamp (00:50:06): That is really interesting. Yeah and that last one, of course, we talk a lot on this show about predictive theories of mind and how that's such an overarching framework for what our mind-body systems are up to. So that fits in really nicely with what you just described in all those ways.

Quinn Conklin (00:50:23): Yeah.

Wendy Hasenkamp (00:50:24): Well, I know one of your most recent projects came out of the surprise of COVID that we all experienced together. And I know you were on track to do a certain project, and then COVID arrived and you decided to do a very different project. So it sounds fascinating in a lot of ways. Could you share some of how that went?

Quinn Conklin (00:50:43): Yeah, absolutely. So you are correct. I was planning to do a much smaller study for my dissertation, with the support of a Mind & Life Varela Grant. And the plan was to develop these remote collection kits to get telomere samples from people who had participated in our Spirit Rock study. And so we wanted to follow up with people who had done this retreat and shown these telomere length changes, to see if that was consistent years later. And another piece of this work was that we wanted to understand the role of early life adversity, and exposure to early life adversity, to see if we could understand whether meditation might be a means to mitigate some of the biological consequences of early life stress and early life adversity. And so we had developed these remote blood collection kits, and were poised to look at cumulative life stressors and stress in the population of meditation practitioners, when the pandemic started to unfold.

(00:51:59) And so fortunately, we had already decided we were going to collect these blood samples remotely. And in a way, the global context of this pandemic was a really interesting opportunity to investigate people who are going through a lot of the same stressors. So we do know of course that the pandemic affected different populations and communities very differently, but there were also a lot of really shared experiences. And so we pivoted and ended up running a study, a year-long study where we followed up with people every four months for a year during the pandemic, and we measured everything we could think of. *[laughter]*

(00:52:45) So we ended up measuring 34 different psychological constructs, things like self-compassion, anxiety, depression, mental health related constructs, interpersonal regulation, all kinds of things. And we also had folks send us a blood sample at the beginning and end of this year to look at telomere length. We took a very detailed meditation history. So one of the things we wanted to do in this study was to get a range of meditation practitioners. So we wanted people from different traditions, different styles who had different lengths of experience. So all the people in this study are people who are interested in meditation, and we wanted to understand how do people implement their meditation practice during this big period of uncertainty and stress, and how does this play out in real life circumstances? So going from studying these really constrained retreat environments to, okay, how does this function out in the world? How do people implement this in their own ways?

(00:53:54) So in order to get at that, we also had people fill out these journaling entries. So we asked them what was the most stressful experience you had in the last week and what was the most supportive experience you had in the last week? And then a whole lot of follow-up questions about how maybe their meditation practice influenced either of those things. So a combination of these open-ended questions to hear from participants in their own words as well as all of these quantitative measures of these psychological constructs and pandemic COVID-specific stressors. How many people do you know who have actually contracted COVID? Have you had COVID? Have you experienced a form of long COVID, or known someone who's passed away from this?

Wendy Hasenkamp (00:54:44): And then did you also get biological samples as well?

Quinn Conklin (00:54:48): We did. So we had people sending blood samples. So for a year, my house was the…

Wendy Hasenkamp (00:54:57): A blood storage center? *[laughter]*

Quinn Conklin (00:54:59): It was the receiving center. So FedEx workers would come and drop off anywhere from 1 to 15 boxes of blood on my doorstep. And fortunately at the time, one of my lab mates, Brandon King, moved in so that we could run this study from our house, and we would take the samples directly to our freezer at the Center for Mind and Brain (UC Davis) and store them. But we had one roommate who was not involved in this study, and he would say things like, "Quinn, the blood is here!" *[laughter]* So it was a unique experience that really my training with Cliff prepared me for. He is always willing to do these kind of wild field studies, and so I have adopted that mentality for sure.

Wendy Hasenkamp (00:55:48): So have you had a chance to analyze data? Are there some answers yet?

Quinn Conklin (00:55:53): So this is a study... Again, my training with Cliff showed me that we can do these massive studies and collect all this data, and it takes a lot of time to analyze and interpret all of that data, and a lot of it never gets used. And so rather than prioritizing journal articles, one of the things I've done with this particular project is prioritize the creation of data sharing tool. We're calling it a data visualization dashboard, but essentially, what we tried to do is really document the study and all of the different measures and create this way for people to explore the data themselves. And so this is not to say that we won't publish all these papers, and we have been analyzing data, and I have bits and pieces of that that I could share. But one of the things that we tried to do differently with this study is create a way to share this data, both with participants themselves, but also with the broader research community, so it can be used for things like meta-analyses, or people trying to design new studies and understand the effects of relationships between, for example, meditation and depression—what do the

general relationships look like—so that they can design better studies. And given the uniqueness of this data set and how much data we collected, we really want it to be of use to the most people. And so one of the things we've emphasized is the development of that dashboard.

(00:57:35) And the other is returning participant reports to the people who contributed their data. And so we spent a fair amount of time developing these reports where we shared people's telomere data and their scores on all of these different metrics and their journaling entries. So one of the things people, this really came out of interacting with our participants and having them ask, are we going to get these things back?

Wendy Hasenkamp (00:58:08): And that's just to the people who... The individual gets their own data back, right?

Quinn Conklin (00:58:14): Yes, exactly. And only if they want it, right? There's also people who don't want to see this data. But yeah, it's been a really interesting experience to interact with the participants and know what they want to know about themselves from this study. And so it's motivated my interest in this community-engaged style of research, to hear from participants what that experience is like to participate in this study, and then what is it that they would want to know from the study. So it's been different approach to how we share the data and what we're prioritizing in terms of scientific outputs. But I've learned a lot.

Wendy Hasenkamp (00:58:58): I love that. I mean, that's really quite revolutionary to think about breaking down that silo of academic research that is so inaccessible to the public, not to mention, as you said, the people who are providing the data. So I just love that line of thinking and effort. Is the platform available in a way that has the anonymized data like that anyone could look at it? Is that publicly available, or just available to other researchers?

Quinn Conklin (00:59:31): Yeah. So we do have a shiny data visualization app that is publicly available to everyone, and I can provide that link if people want to check it out.

Wendy Hasenkamp (00:59:41): Yeah, we'll add it for the show notes.

Quinn Conklin (00:59:43): Yeah. So the idea is yes, all of the data that is published there is anonymized, and we did try to really take care about making sure it was properly anonymized and that things weren't inadvertently revealed in ways that we weren't expecting. And the goal is if there are people who actually want to use that data, they can contact us and we can set up a collaborative arrangement so that they can use some of that data, but we won't publicly share the data or make that accessible by default.

Wendy Hasenkamp (01:00:19): That's great. I know another effort that you were incorporating into that work was to try to really increase the diversity of your sample. Are there things to talk about along those lines?

Quinn Conklin (01:00:29): Yeah, absolutely. And we could probably have spent the whole time talking about that process and what that looks like. But I will say that this study represented a unique and new sort of opportunity for our lab because given our focus on retreats, prior to that, we hadn't thought a whole lot about recruitment because we were limited to the groups who had already signed up for these retreats. And so it wasn't a domain we had really thought about. But when we pivoted to do this

more national remote study and recruit via the internet in all of these different ways, we had the foresight, thankfully, to include a demographic survey prior to people enrolling.

(01:01:18) And one of the things we noticed right away, and which we knew would be the case given the demographics that have been generally involved in this research, was that the folks we were initially contacting and finding were predominantly women and predominantly white women with pretty high socioeconomic status. So lots of education, higher incomes. So what that meant for us was that we wanted to reach a broader, more diverse sample and more representative of the general US population. And it sparked an entire redesign of our recruitment materials and our study materials and how we went about recruiting and engaging with people.

(01:02:09) I will say that our initial research group and longstanding research group is predominantly white. And this was a new experience for us that we did in a very clunky way. I think we learned off the bat what not to do. And after a few attempts of reaching out to folks and trying to build these different relationships, we realized we really needed professional support in that respect, with someone who had really helped researchers understand the areas that they were missing and how to make your research materials more inclusive. And that is when we reached out to Dr. Kamilah Majied, who has been just an absolute delight to work with. She is so incredible in both her really clear directives and guidance, while really thoroughly re-imagining what this process could look like.

(01:03:18) And the thing that I want to really emphasize is that at the end of the day, our study population still looks really skewed. So it's still predominantly socioeconomically advantaged white women. But that process, in going through that process, we ended up expanding our recruitment window by six months to really try to access different communities and build relationships with different communities. And one of the processes that we engaged in there was holding informational sessions. So we made space for people who might be interested in engaging in the study or even advertising the study to their communities to come and ask us questions, and to tell us what they thought would be important to study.

(01:04:14) We also got a lot of input from people about how our research agenda was really apparent, and how to engage with community building and relationship building, and how critical it is for that to happen even before you think of your research question, even at the development of what is it that we are going to study and how important it is for different communities to be involved in that process. Because by the time you get to having a study that is designed and approved, it is harder to change things, but it can also really be off the mark in terms of what communities care about.

Wendy Hasenkamp (01:04:58): Yeah. Oh, I love that you've been engaging in that work. I think it's so important. I feel like a lot of the ways that you're approaching your research are really trying to shift or question these norms that we've had for so long, that are really harmful and not inclusive. So I really appreciate all of your work and efforts in all these domains. This has been so great to chat, Quinn. Is there anything else that you wanted to say in closing, or big picture, or final thoughts?

Quinn Conklin (01:05:29): Yeah. I think this is just such a beautiful time to be engaged with this work for exactly that reason that you just mentioned is that we are really questioning some of the structures and the norms, particularly in academia and science, and within this contemplative space. And we have a lot of work to do yet in terms of building more inclusive and conscious models of how we go about things. But it's really encouraging to see people making those efforts and to engage in the reflective processes necessary to hopefully move this in a more inclusive direction.

Wendy Hasenkamp (01:06:12): Yeah. Well, thank you for being such a pioneer in that direction and for sharing all of your work with us today, taking the time. It's been really, really fun to chat.

Quinn Conklin (01:06:22): Thank you.

Outro – Wendy Hasenkamp (01:06:27): *This episode was edited and produced by me and Phil Walker. And music on the show is from Blue Dot Sessions and Universal. Show notes and resources for this and other episodes can be found at podcast.mindandlife.org. If you enjoyed this episode, please rate and review us on Apple Podcasts, and share it with a friend. And if something in this conversation sparked insight for you, let us know. You can send an email or voice memo to podcast@mindandlife.org.*

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