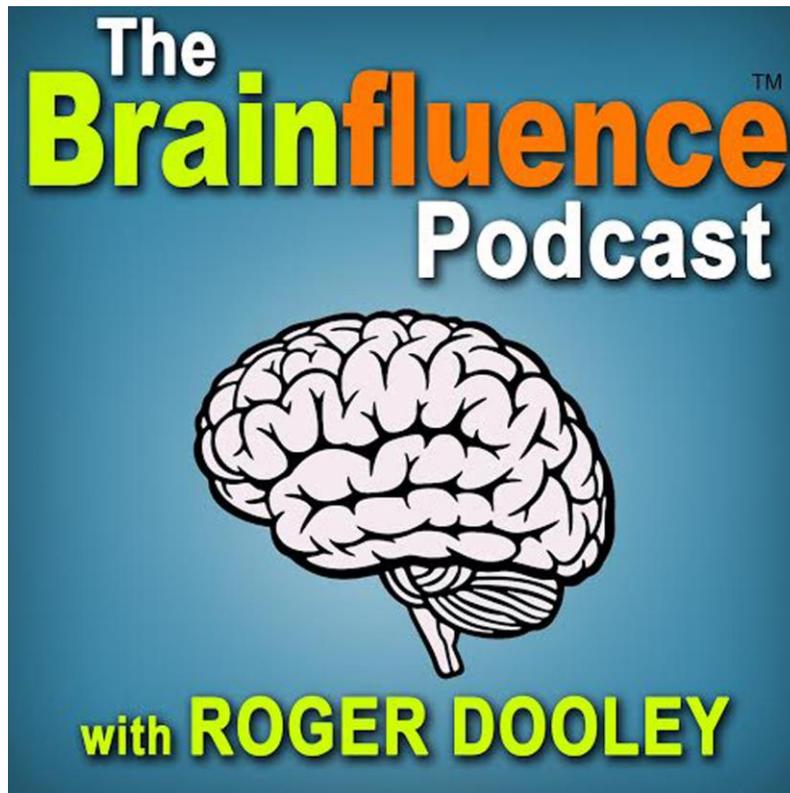


Ep #89: How to Leverage Brain Chemistry with
Dr. Loretta Breuning



Full Episode Transcript

With Your Host



Roger Dooley

[The Brainfluence Podcast](#) with Roger Dooley

Ep #89: How to Leverage Brain Chemistry with Dr. Loretta Breuning

Welcome to the *Brainfluence Podcast* with Roger Dooley, author, speaker and educator on neuromarketing and the psychology of persuasion. Every week, we talk with thought leaders that will help you improve your influence with factual evidence and concrete research. Introducing your host, Roger Dooley.

Roger Dooley: Welcome to the *Brainfluence Podcast*. I'm Roger Dooley. Our guest this week is an expert on neurochemistry. She's a professor emerita at California State University, East Bay and the author of *Beyond Cynical* and *I, Mammal*.

She writes the blog, *Your Neurochemical Self* at Psychology Today. She's the founder of the Inner Mammal Institute. Her newest book is *Habits of a Happy Brain: Retrain Your Brain to Boost Your Serotonin, Dopamine, Oxytocin, and Endorphin Levels*. Welcome to the show, Loretta Breuning.

Loretta Breuning: Hi, nice to be here. Thanks.

Roger Dooley: Great. It's really nice to have you here. I'm curious, how did you get to be a professor emerita at what I would guess to be a comparatively youthful age? I've seen your photo and actually I just saw you live briefly when we first connected and either you have really good Photoshop skills or you haven't quite hit that generation of the 80, 90 year-old codger that I think of as a professor emeritus. What's the story there?

Loretta Breuning: Oh, well, this is sort of funny. When I was 49, I got the official email from our benefits people informing

Ep #89: How to Leverage Brain Chemistry with Dr. Loretta Breuning

me of my retirement benefits. I hadn't thought of retiring at that point but the idea started forming in my head that I'd spent twenty years doing the same thing and while I still had a few brain cells left, I thought I should do something else.

Roger Dooley: That's great. So you basically retired from academia and started your next phase and career.

Loretta Breuning: Exactly.

Roger Dooley: That's great. Something that I think probably a lot of listeners will identify with too because I know we have a lot of entrepreneurs who listen and many of them perhaps thought they were going to be with a corporation for the rest of their lives and then either hit the point where they're able to retire or just decided that the time had come to separate. So that's great. Well, congratulations on starting what's really a fascinating new chapter in your career.

So I've got another slightly off-the-wall question for you, Loretta. My research found that you discovered a link between a wildlife documentary and the lyrics of a country western song. So before we really get into the meat of it, you've got to explain that one to our audience.

Loretta Breuning: Oh, it's so funny. If you study each species of primate, they have a certain lifestyle that is just like things you see on TV. So I'll tell you the funniest example, gibbons. They're the only monogamous apes. And how do they keep the magic alive? Well if another male comes onto their territory, the male of

Ep #89: How to Leverage Brain Chemistry with Dr. Loretta Breuning

the couple tries to kill them. If another female comes onto their territory, the female tries to kill them.

The way this works for everyone who's studied evolutionary psychology, it's all to benefit the survival of their genes because when they protect a specific turf, the food in that turf becomes available for their kids. The patterns of each primate species vary widely but one way or another it's always, "Oh, it benefits their offspring in that particular ecological niche."

Roger Dooley: Interesting.

Loretta Breuning: So trying to kill competitors for the hand of your partner.

Roger Dooley: Right, right. That's kind of a dark country western song but I'm in Austin, Texas so we've got a lot of country music here. There are certainly a lot of strange themes there. Well thanks for enlightening me on that and that's interesting.

Loretta Breuning: Well tell me a theme and I'll tell you which monkey it is.

Roger Dooley: Yeah, that probably might be going a little bit far afield but many of them seem to revolve around pickup trucks, occasionally horses, and dogs, and of course, lost loves. Which actually I guess lost love is probably not something that is quite as common in the primate world.

Loretta Breuning: Oh, yes, it absolutely is.

Ep #89: How to Leverage Brain Chemistry with Dr. Loretta Breuning

Roger Dooley: Or is it?

Loretta Breuning: It is because there's a constant competition and when you go for an opportunity. Well female chimps are only sexually available once every five years. You don't want to go too far afield [laughs]. But then there's ...

Roger Dooley: I'll restrain myself from commenting on that one.

Loretta Breuning: [Laughs] It's all in *I, Mammal*. But the bottom line is there's a lot of competition. So when you lose out in a competition, you feel bad because the stakes are high and that feeling bad is a real thing, it's a real neurochemical response that promotes your genes.

Roger Dooley: Right, but I think I read that primates are—other than humans—tend to get over it more quickly than humans do. Or humans have the ability to sort of hold that in their mind for a long time.

Loretta Breuning: Absolutely. That's exactly the difference.

Roger Dooley: And hence, write songs about it.

Loretta Breuning: [Laughs]

Roger Dooley: So, okay. Onto more serious topics. You talk about mammalian brain and I know in the field of neuromarketing there's been a lot of discussion about the lizard brain, which is one of the three brains in the triune brain theory and a lot of talk about how you have to sell to the lizard brain.

After reading your book, I'm thinking that maybe you would say that we should be selling to the

Ep #89: How to Leverage Brain Chemistry with Dr. Loretta Breuning

mammalian brain. Also, I take it, it's sort of implicit that you do subscribe to the triune brain theory, would that be true?

Loretta Breuning: Well, you probably know that academia has dismissed that theory and they always say, "That's simplistic." So the bottom line is that it's not a simple division. It's just that ... like most species have all these parts but when one part is really small, for example, the lizard has so little cortex and so little limbic system that it relies totally on its brain core, its brain stem. So a mammal has more of this so it relies more on those behaviors.

So we use what we have. But what I object to is the idea that is often passed around that your lizard responses are bad and you shouldn't have them. Because in fact, you would be a zombie if you didn't have responses. You would never act. So it's more useful to think that all of our brains work together.

The way they work together is with neural circuits we built from past experience. These neural circuits are very hard to change. That's why we do things that don't make sense. It's not blaming the lizard, it's that old circuit that your brain built from your past experience. So your brain thinks, "Oh it must be true because it happened to me."

Roger Dooley: Right. I think you make a good point. It seems like every theory of the brain division eventually, I won't say collapses, but it has to be modified a bit because it turns out that it's more complex because for a while there was the right brain, left brain and Sperry's great

Ep #89: How to Leverage Brain Chemistry with Dr. Loretta Breuning

experiments. Everybody thought they had that down and then of course, it's not quite that clear. Obviously there's a lot going on that can be happening in both sides or you can have relocation and so on. Then the split that I tend to use quite a bit in my work is just conscious and nonconscious. Again, even there, you can't really always draw a line. But to me, it sort of maps to Kahneman's System 1 and System 2.

Loretta Breuning: Yes.

Roger Dooley: You need these sort of shorthand tools to think about complex topics. So even though a neuroscientist might say, "Well that right brain, left brain stuff isn't really accurate." But sometimes, it may be a quick shorthand for some useful ideas.

Loretta Breuning: But the piece that I think is left out of so many of these, like Kahneman's fast and slow, my fast and slow is different from your fast and slow because mine were wired from my actual experience and yours were wired from your experience. Now some aspects of our experience is universal because our brain evolved to focus on survival needs but some of our experience is very random. So brothers and sisters, they have different early experiences.

Now none of us like to think we're relying on old circuits from early experience. But you may have heard of myelination. So this is what turns your neural pathways into super highways and myelin stops, like drops sharply, after puberty. That makes a lot of sense in the state of nature, you wired yourself when you were young. Then you transferred to a new

Ep #89: How to Leverage Brain Chemistry with Dr. Loretta Breuning

niche to improve your mating opportunity. Then that's it. You're left with the neural pathways you had.

So I explain that they're like paving. That you're born with billions of neurons but very few connections between them. Each time your happy or unhappy chemicals are released, that makes connections. You can think of that like paving on your neural pathways. If those connections happen before age eight or during puberty, they get myelinated. That's what feels real to each person.

Roger Dooley: Right. I think in Kahneman's division one thing he notes is that he talks about heuristics and rule-based decisions. So to some degree, those are those pathways that were forming where we are applying past experience. Rather than actually thinking about something, if it worked once for us, or better even if it worked ten times for us in the past, we don't have to think about it anymore. We can just process that in System 1 and not weigh the consequences.

Loretta Breuning: Yes.

Roger Dooley: I think that's good. It reminds me of the famous statement that's been attributed to various folks about neurons that fire together wire together. Hebb and I think, SCARF, and it actually goes back to Freud. The concept sort of goes back to Freud but I think Hebb is the one that put it in those exact terms. That in conjunction with the myelination is what you're talking about, that we're forming these pathways and connections in our brain.

Ep #89: How to Leverage Brain Chemistry with Dr. Loretta Breuning

Loretta Breuning: But it's not just firing together in terms of a cognitive memory like, "Oh, I remember the day when this or that happened." It's the feeling. So when you're young, you notice that a certain behavior gets a cookie and another behavior causes you to lose your cookie.

So your brain learns, "Oh, this is the kind of behavior that will meet my needs and this is the kind of behavior that will cause pain that I should avoid." It's not necessarily conscious or cognitive but it's meeting of needs and the associated feelings that are triggered even though you don't remember that experience necessarily.

Roger Dooley: Right. Well, why don't you tell our listeners what the four happy chemicals are, if you will, that really affect so much of our processing.

Loretta Breuning: Okay, sure. And people have probably heard about them but a lot of what's said is based on sort of narrow, medical applications and if you look at what they do in the animal world, it's so obvious that they create survival motivations that you can see in everyone else around you.

Dopamine is the good feeling that a reward is at hand. So in the state of nature, you had to forage all the time to find food. Imagine yourself scanning around for cues, "Oh, is that food? Is that food? Is that food? Oh, there's food." So when you see evidence of a reward, that releases your energy and that's a good feeling of excitement.

Ep #89: How to Leverage Brain Chemistry with Dr. Loretta Breuning

But today, because we're not hungry then an equivalent example would be, let's say someone bakes a cake and for an hour you smell my cake baking in the oven. So that's the cues that tell your brain a reward is at hand, a reward is at hand. So obviously, we use this to motivate ourselves with more distant rewards but every one of these happy chemicals has a downside.

So first, they only turn on in short spurts, so you know once you take that cake out of the oven. It feels fabulous for a few minutes and then an hour later, you're back to who you were. This is why people have long-term goals but anything that gets in the way of your long-term goals feels like a survival threat to your mammal brain. Even though you consciously know that it's a not survival threat. So there's always the positive and negative. But we're constantly running around trying to stimulate more dopamine.

It's so clear in monkeys that once you get a reward for a while, it stops triggering dopamine because there's no new information. So that's the been-there-done-that feeling, which is why we're always looking for bigger and better and newer.

Roger Dooley:

Right. Would that be why we experience sort of hedonic adaptation, where if you move to San Diego from the upper peninsula of Michigan in the winter, boy, you really notice a huge change. Every morning you wake up and you walk outside and you can't believe how gorgeous it is and after a year or two,

Ep #89: How to Leverage Brain Chemistry with Dr. Loretta Breuning

suddenly you walk outside in the morning and it's another day?

Loretta Breuning: Yeah, that's a great example and that's why I guess I'm not moving to Hawaii, right? [Laughs]

Roger Dooley: Right, better to vacation there periodically and really experience it.

Loretta Breuning: Yeah, but ironically, I don't know how much time you spend in San Diego but people are skilled at finding flaws. Like as perfect as an environment might be, the brain looks for what's wrong. So I'm talking about the happy chemicals but the unhappy chemicals is another whole story.

Roger Dooley: Right. So is that the cortisol kicking in?

Loretta Breuning: Yes, absolutely. It's how our natural skill of looking for threats, which kept our ancestors alive and once cortisol kicks in, your higher brain looks for patterns that were associated with threat in the past. And your higher brain quote/unquote, just wants to keep your mammal brain happy so it finds evidence to fit.

So if I feel bad, it's like, "I don't even know why I feel bad," so my brain is looking for evidence of something bad. Many listeners probably can notice themselves making a big deal out of nothing, that's just to put it colloquially.

Roger Dooley: So how can a person harness these chemicals or engage in behaviors that result in hopefully a happy and productive life? I guess I mention productive because again, we have a lot of business listeners

Ep #89: How to Leverage Brain Chemistry with Dr. Loretta Breuning

and I think that some of these things that you're talking about certainly apply to how effective you are in business, whether you're enjoying what you're doing, whether you can stay focused and so on.

Loretta Breuning: Yes. By the way, I haven't done the other happy chemicals yet so I'll do that.

Roger Dooley: Okay.

Loretta Breuning: That's exactly, productivity stimulates dopamine. So we all know that if you have a cookie, it feels good for a minute but then after a while, you're back to who you were. So if you're only strategy is another cookie, you'll be frustrated and that's why higher goals are such a valuable way to stimulate dopamine. But again, they can also lead to frustration if we're always focused on the very distant and never end up with actual dopamine in the short run.

So I'll just mention, a simple strategy for the dopamine is to always have a short-run goal, a long-run goal, and an immediate-run goal. So for example, if I sit down at my desk and I have a million things competing for my attention, then if I say, "What's one thing I can get done, let's say in the next hour, and I will feel so good when I get that out of the way?"

Then I focus on the fact that I'm going to feel good about doing that rather than be overwhelmed. So focusing on the goals shifts you from the expectation of harm, to the expectation of reward. That's so useful.

Ep #89: How to Leverage Brain Chemistry with Dr. Loretta Breuning

Roger Dooley: So is that why you get a sense of satisfaction when you cross something off your to-do list?

Loretta Breuning: Yes, absolutely.

Roger Dooley: Because I know I find that satisfying. It isn't a big action but somehow the symbolic act of drawing a line through it or checking it off on the computer adds something to the satisfaction of actually having accomplished whatever the task was, even if it was something trivially small: sending an email, making a phone call, or something like that.

Loretta Breuning: Well here's the thing, it's the expectation of reward that stimulates dopamine. Everyone knows the story of Pavlov's dog. So it's the expectation of a reward. So if you tell me to take steps toward singing in Carnegie Hall, I know that's not me, that's not something I can achieve, so it doesn't turn on my dopamine. Someone else who has a realistic expectation of that goal, then each step they take toward it feels good.

So it's the steps toward a goal and it's so easy to see this from the perspective of an animal. Imagine a lion is hungry and lions have a very high failure rate so they make careful decisions about when they invest their energy. So they scan for evidence of a good reward and they're like, "Oh, I won't get that one. I won't get that one. Oh, there's one I can get." That's what releases the dopamine.

If a lion ran after everything it saw, it would starve to death because its energy would be used up before it got something it could eat. So it's those careful

Ep #89: How to Leverage Brain Chemistry with Dr. Loretta Breuning

decisions about when to release your reserve tank of energy that triggers the good feeling of dopamine. It's unfortunate that many young people learn to do that with videogames sitting on the couch and don't always transfer that to other forms of activity.

Roger Dooley: Right, well I think the videogame developers are masters of manipulating the brains of users and producing those rewards and creating engagement. And of course, they have the data to do it right. It's like a giant behavior experiment for them. So let's get onto the other happy chemicals.

Loretta Breuning: I'm sorry. Yes, can I just reply to that?

Roger Dooley: Sure.

Loretta Breuning: I think it's not helpful for us to blame the system because that's renouncing our power over our own brain and especially if it's our own kids. I say this having frankly figured this out after my kids were grown up.

But, everyone now is talking about children's brains are not fully formed and that's why they make bad decisions. This is a real misconception. Brains are formed from experience. So if you let your kid sit on the couch and serve them pizza and their girlfriend comes over to visit, then all of their survival needs are met without them doing anything. And that, they wire their brain to expect other people to serve them pizza on the couch.

Ep #89: How to Leverage Brain Chemistry with Dr. Loretta Breuning

So you're really not doing yourself a favor by letting people in your life give up their awareness of their own power over their brain.

Roger Dooley:

Good point. I wasn't really blaming videogame developers. Actually, I'm occasionally a player of those things myself and I find them very engaging and fun and I appreciate the meticulous design that went into them and occasionally you encounter a game where the designers were not very adept at that and it's simply not fun to play. They haven't mastered that ability to get you into a state of flow and trigger your reward system and so on. But anyway, let's get to the other happy chemicals.

Loretta Breuning:

Yeah. So let's talk about endorphin because that's the one people have probably heard the most about because of the runner's high. Endorphin, maybe you can tell from the word, is analogous to morphine. All this research is rather new and endorphin was the first one that was discovered but there's sort of a misunderstanding.

It creates a feeling of euphoria but it's only triggered by real physical pain. So when you watch those nature videos and you see the zebra bitten by a lion and its flesh is ripped open but it's still able to run and save its life. Or if you were a caveman and you broke your leg, you could still go to a place where you could get help. So endorphin masks pain for about twenty minutes and then you feel pain because pain is vital information.

Ep #89: How to Leverage Brain Chemistry with Dr. Loretta Breuning

So we are not meant to inflict pain on ourselves just to get an endorphin rush. So runners only get an endorphin high if they run to the point of pain. You can see that that's not really a good long-run strategy. The good news is that a little bit of endorphin is stimulated by laughing, crying, and stretching. But it's only a real belly laugh, which is hard to predict. And crying feels bad as well as endorphins, so that's not a good habit. And stretching, you know it's just like a little bit and if you overstretch, obviously, that's not good.

So we can't count on endorphin to make us happy all the time. Although you could say if I am sitting for an hour at my desk, the first minute of getting up and moving around feels good but it's not a high and you can't rely. You've got to exercise whether it makes you high or not.

So, let's talk about oxytocin.

Roger Dooley: Yeah, we had Paul Zak on the show some months back so our listeners should be a little bit familiar with that.

Loretta Breuning: Oh good, good, okay. So endorphin as you know is called the bonding hormone and creates the good feeling.

Roger Dooley: Oxytocin.

Loretta Breuning: Yeah. Oh, what did I say? Oh, excuse me. Oxytocin causes the good feeling that we think of as social trust. So when you're in love you're not thinking of that as social trust, but that's the feeling that

Ep #89: How to Leverage Brain Chemistry with Dr. Loretta Breuning

somebody is going to meet your survival needs. When you have a group that you belong to you that you feel like they're there for you, they have your back, that's another example of the oxytocin feeling.

If you have bad will with someone and then you create one moment of truce, you might notice that it that way. So a fascinating example would be if I walk toward a horse and see these huge teeth coming at me and the mouth is open, then I sort of make peace with the horse. There's a lot of people that do equine therapy so that sort of a visible example, tangible example.

Now all of these have a bad side. The bad side of oxytocin is what we experience as the ingroup, outgroup dynamic. In every mammalian group, there's a common enemy. For example, if a gazelle leaves the herd, they'll be instantly eaten by a lion.

So that gazelle is going to stick with the herd even if it's sort of annoying to be so close to these people who are competing for your grass and you'd rather walk off to greener pastures and have it to yourself. But if you leave the herd, your oxytocin falls and your brain says, "Well, my survival is immediately threatened."

So all these happy chemicals compete against each other. I have an infographic about that. It's like, "Well, I would rather head to greener pastures but then I lose the good feeling of safety in numbers." So we're always managing the competition among these. Now, the amazing thing, even lions have a common

Ep #89: How to Leverage Brain Chemistry with Dr. Loretta Breuning

enemy. If a lion leaves the herd, a hyena will take their food after they kill it, a group of hyenas.

So lions have to stick with the group even though they have a very severe pecking order and sometimes they starve because the ones above them get the food but they don't leave the group because they get nothing if they leave.

Roger Dooley: Interesting, might be a parallel in some corporations where you've got the lowly ranked people in the corporation who really aren't getting much from it but the alternative is worse.

Loretta Breuning: Well, yeah. But here's another way of thinking about it, the marketing department has conflict with the sales department but when they become aware of a common external threat, then the marketing department and the sales department cooperate.

So each group is focused on its own needs but when they see a common enemy, then they expand the perception of the group. When I talk about groups, it's not just social groups but just the casual groups that we form as we chitchat in everyday life.

Roger Dooley: Right. I've actually written about the use of ingroup, outgroup marketing techniques that define your customers as being part of a desirable ingroup. Then sort of demonizing the other people who are not your customers. Apple has used that very effectively for one.

Loretta Breuning: Absolutely, absolutely, yes. So maybe move onto serotonin which is very difficult and controversial. In

Ep #89: How to Leverage Brain Chemistry with Dr. Loretta Breuning

the 70s and 80s there were monkey studies that showed that the monkey that one-upped the guy next to it got a spurt of serotonin. And I say “the guy” colloquially but in fact, females are just as bad as this.

So if you have a bunch of females who are foraging together, the higher status—I’m sorry, female chimps, the higher status female chimp is going to hog the safest and most rewarding foraging spot and then the others will cluster around her. If anyone doesn’t go along with the program, she threatens them. This is very uncomfortable for people so you can imagine that all this evidence just disappeared and no one talks about it but it’s so easy to see in daily life.

The simple thing is that our brain is constantly comparing us to the individuals around us and saying, “Should I go for the banana? If I go for it, I might get bitten. But if I don’t go for it, I might starve. I might lose out on mating opportunity for five years.”

So our brain evolved, constantly weighed that evidence and made that decision. Then it’s darn frustrating. In fact, if all your other survival needs are met, this is where your brain goes and it can drive you nuts even if you have a great life. So that’s really what I try to help people understand.

Roger Dooley:

Is it possible for us to affect other people’s brain chemistry in a positive way? For instance, if I’m in a business relationship are there actions that I can take or things I can do that will perhaps get the other party in a happier frame of mind or release perhaps some

Ep #89: How to Leverage Brain Chemistry with Dr. Loretta Breuning

oxytocin, without giving a big hug, which might be kind weird. Or some of the other brain chemicals that you're talking about?

Loretta Breuning: Sure, yeah. This is the interesting challenge. Imagine you have this jungle of neurons and any pathway that's already paved, the electricity in your brain flows like water in a storm. It finds the path of least resistance and just flows effortlessly. When you try to activate a pathway that's not already paved, it takes a lot of effort.

So if you model a behavior for a person that you'd like to influence, their mirror neurons will take it in and that will help them stimulate a new pathway. But imagine if you were slashing a new trail in the Amazon, it's so hard work to slash a trail just to take one step. If you come back to that trail tomorrow, it's already overgrown. So you have to re-slash that trail every day for 45 days for it to establish.

For example, if I had contact with people on a daily basis and I had certain behavior that I would want to model, let's just say positivity. I might get a bad reaction at first. Say, "Oh well, yeah, I agree with what you're saying but we could also focus on the positive. For example, blah blah blah." The person may have a derisive response but it's still starting to trigger those synapses. I say synapses, that's simplistic shorthand.

In 45 days, that person may start being positive too. But during those 45 days, they will not necessarily acknowledge that this is a good thing. Even after the

Ep #89: How to Leverage Brain Chemistry with Dr. Loretta Breuning

45 days, they will think they thought of it themselves because now it's a pathway in their brain and they're like, "Oh yeah, wasn't I always like this?"

Roger Dooley: Interesting.

Loretta Breuning: We're so unaware of our pathways.

Roger Dooley: Well, we're just about out of time. Let me remind our listeners that we're speaking with Loretta Breuning, author of *Habits of a Happy Brain: Retrain Your Brain to Boost Your Serotonin, Dopamine, Oxytocin, and Endorphin Levels*. Loretta, how can people find you and your content online?

Loretta Breuning: Thanks. InnerMammalInstitute.org, that's the information resource, there's a few books as you mentioned, *Habits of the Happy Brain* is the new one. Retrain your brain to boost your happy chemicals. *Retrain Your Brain to Boost Your Serotonin, Dopamine, etc.*

I also have a lot of free resources. One of them, there's an opt-in as soon as you go to the site. It's a five-day Happy Chemical Jumpstart. Every day for five days, you will get one email message for that happy chemical and some tips on how to rewire it. I also have infographics and slideshows and I have a YouTube video. Next week, I will have up certification training. Excuse me ...

Roger Dooley: By the time this airs, that will probably be there. So we will link to that site and the resources we discussed during the show. Loretta, thanks so much for being on the show.

Ep #89: How to Leverage Brain Chemistry with Dr. Loretta Breuning

Loretta Breuning: Thank you.

Roger Dooley: Yes, and what I failed to do here was tell folks where they will be able to find those links. That will be on the show notes page along with a text version of our conversation and that will be at RogerDooley.com/Podcast. Thanks, Loretta.

Loretta Breuning: Thanks. By the way, I misspoke when I said next week. Next year, the certification training will be available but the Happy Chemical Jumpstart will be available in Spanish next week.

Roger Dooley: Okay, great. Thanks. Bye-bye now.

Loretta Breuning: Bye.

Thank you for joining me for this episode of the *Brainfluence Podcast*. To continue the discussion and to find your own path to brainy success, please visit us at RogerDooley.com.