Conscious Life presents
TRAUMA
SUPER CONFERENCE

Trauma and the Gut Brain Axis

Guest: Rebecca Edwards

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[00:00:10] Kirsty Cullen

Welcome to the Trauma Super Conference. I'm Kirsty Cullen, CEO of the Optimum Health Clinic, a UK based clinic specializing in fatigue related illness. And certainly with fatigue related illness, it is certainly not uncommon for us as practitioners to see trauma as part of the fabric of our client cases, either as a contributing factor of poor health, or trauma as a consequence of having a chronically debilitating illness. Trauma can impact many systems in the body on a physiological level. And during today's interview, we're going to consider the impact of trauma on the gastrointestinal system.

So for this interview, I am delighted to introduce Rebecca Edwards, director of education at Activated Probiotics. Rebecca is a qualified naturopath who practiced in London for over 10 years, in addition to over 18 years experience as a global educator in the field of complementary and integrative health. In her current role at Activated Probiotics, Rebecca has been able to continue her passion for using cutting edge research in the therapeutic field. Rebecca, welcome.

Rebecca Edwards

Hi, Kirsty, thank you so much for having me. It's absolutely lovely to be back with you.

Kirsty Cullen

Wonderful. And I know during this conference we've already spoken with Anastasia Smith, looking at how gastrointestinal testing might be used to explore the impact of trauma on the gut, so today it's really wonderful to be able to take a deeper dive with you into the research and explore the evidence that links trauma with the gut. And to do that, I wanted to start with the topic of IBS, if I may.

As we all know, IBS is a common gastrointestinal condition. I think the University of Leeds published a review paper not so long back, looking at the estimated figures for global prevalence, which are very difficult to nail down due to different sort of diagnostic criteria, but they landed on the fact that it was somewhere between one in 11 and one in 26 people that suffer with IBS globally. So with that figure and that scale in mind, then, the knowledge that there is a strong link between trauma and IBS is particularly interesting. And I wonder if you'd be able to expand on the research that demonstrates that link between the two.

[00:02:43] Rebecca Edwards

Yes, and as you pointed out, research into IBS can be quite tricky to get really accurate statistics. And the main reason for that, as I'm sure that you and your colleagues and your listeners are well aware, is that IBS is not technically a disease or a condition in and of itself. It is, more than anything, the absence of any other diagnosis. So it's what we see in people who present to us or to other healthcare practitioners with unpleasant and unwanted digestive symptoms, but anything more sinister has been ruled out.

So I strongly suspect that the incidences worldwide of IBS is much higher than those statistics suggest but it can be, as you pointed out, very difficult to get accurate, accurate statistics. What we do know is that it's more likely for people who are presenting with more psychological, emotional and mental well-being concerns to also be experiencing disturbances in their digestive function.

And this is no surprise when we look at it on several different levels. I mean, I always love to think about the digestive system in terms of its position in the human body. I mean, think about what it is and where it is. Your digestive tract is literally at the center of your body. How can it not affect every single part of you? And how can every single part of you not be affected by this system which is holding everything altogether?

So it makes so much sense that there is going to be a connection between digestive symptoms and the whole person, including the mental, the emotional, the spiritual, et cetera. But to bring it back to what the statistics show us, et cetera, we do see a strong correlation between diagnosed Irritable Bowel Syndrome and people who also have diagnoses anywhere within the spectrum of mental health. And I suspect that that relationship is going to be even stronger with people in the trauma community too, for a variety of reasons, which I suspect we are about to unpick.

Kirsty Cullen

We certainly are. So the research suggests that trauma may trigger specific compositional changes within the microbiome itself. So can you tell us a little more about the actual impact on those individual species and on the gut microbiome as a whole?

Rebecca Edwards

Yes, it's very, very interesting because several studies now have tried to examine, could you look at the microbiome analysis of somebody who has experienced trauma and be able, without knowing anything about the person, could you essentially pick out from their fecal sample if that person has experienced trauma or not? And there's a lot of mixed results in the world of microbiome testing and research.

And again, lots and lots and lots of reasons for this, some of which I'm sure you've discussed with other contributors, that the definitions around trauma itself and Post Traumatic Stress Disorder and Complex PTSD and stress and all of this can be quite... There can be discrepancies around diagnosis. It can be hard to follow people who have experienced trauma through long term studies. It can be hard to get funding.

There are lots of reasons why large scale repeatable clinical trials have not been completed, but some that have been completed have shown really interesting responses, really interesting results.

So there is interesting data on the diversity and community composition of the gut microbiome in people who have been diagnosed with PTSD. And one study which was quite interesting, was looking at comparing the gut microbiota results of a group of PTSD identified individuals compared to a control group who did not have PTSD.

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And the researchers were able to find common differences. Overall, they didn't find necessarily that there was reduced diversity, so there wasn't necessarily a reduction in the overall number of microbial inhabitants that they found or the number of different types. But what they did find was that several phyla and genera were overrepresented in those who had experienced trauma.

And several phyla and genera which we know are associated with beneficial or positive gut health were underrepresented. So they found that the PTSD group exhibited higher levels of what we call pathobionts. And these are microbes which may be associated with not just IBS but other functional gastrointestinal presentations. So the PTSD group had higher levels of enterococcus, higher levels of Shigella genera, and they had decreased levels of particular families of microbes which are more associated with positive outcomes when it comes to gastrointestinal health.

Interestingly, when we then look at what some of those species and genera are associated with, and especially when you compare it to some of the earlier pre-clinical animal studies which were done, things start to show up that are really, really interesting. And one of the most interesting things, and it's a little bit distressing to talk about because it does involve animal research, which I always find difficult to read about.

One interesting animal trial found that animals which had been exposed to trauma had in their microbiota higher levels of microbes associated with the breakdown of carbohydrate. And the researchers are drawing a relationship between potentially the idea that we may have different dietary triggers and cravings when we are experiencing different types of mental health presentations.

So there may be something in that, that almost kind of old wives' tale of, it's quite a crude statement, but feeding depression, the idea that when someone is experiencing depression or other symptoms of mental ill health, that they may be drawn towards eating a more carbohydrate or sugar rich diet. And this may correlate with what's going on in their microbiome, too. So it is endlessly fascinating, and there is so much to unpick.

And also, it's interesting that we're talking about this now, Kirsty, because very recently there was a study published, one of the first studies to be published in 2023, and I'm sure you've seen it, looking at the microbiome of Buddhist monks which found that compared to their neighboring communities who lived in the same part of Tibet and ate the same diet, Buddhist monks who meditated exhibited different microbial communities in their microbiome analyses compared to the control group.

And what was interesting was that the microbiota which were enriched in the monk group who meditated were more associated with a reduced risk of anxiety, depression, cardiovascular disease and immune dysregulation. So it was, you know, so it was only a small study, it only contained 56 Tibetan Buddhist monks, but it's highly suggestive of that really tangible link between mental and emotional well-being, gut function, the microbiota itself, and positive clinical outcomes.

[00:10:46] Kirsty Cullen

Fascinating, isn't it? Because it mirrors what we see in clinic, doesn't it? It mirrors the dietary patterns, the cravings that we might see in clients with anxiety and trauma. And obviously, it demonstrates to us that a healthy microbiome optimizes the messages sent to the brain promoting healthy mood and balance, but also vice versa.

So I wonder if we can talk a little bit more about that two way communication between the gut and the brain. And maybe specifically, how do our gut bacteria have a role to play in the production of neurotransmitters and how is that relevant to our mental health in turn?

Rebecca Edwards

Yeah, it's really interesting because I've often talked about it as a bidirectional channel of communication, but I think I've been kind of underestimating it a little bit and it's probably actually a tridimensional communicational axis. And there's more to, what we've always referred to as, the gut brain axis than just the gut and the brain. And I think we really need to bring in another element here of its own, which is the microbiome.

And so we're really looking at what we are now sometimes referring to as the MGB axis, the microbiota gut brain axis, where we've got a triple pathway of communication and each organ is affecting the other two. And I very deliberately used the term organ there because we are now very much accepting the idea that the microbiome, the collection of microbial life forms that exist inside our digestive tracts and in many other places, is really equivalent to a human organ.

So the microbiota affect the functions of the digestive tract. The digestive tract affects the composition of the microbiota. The microbiota affect brain function, brain function affects gut function, gut function affects microbiome. And around and around we go in this kind of triangular association. So we know that there are both direct and indirect pathways through which these microbial life forms can influence our central nervous system, so that's our brain, can influence cognition, can influence mood, and the other way around.

And this can encompass the endocrine system. And this is largely via the hypothalamic pituitary adrenal axis. It can also play out through the regulation of cortisol secretion, through immune regulation as well, because the composition of the microbiome will also influence the release and the balance of chemokines and cytokines. And as you are very well aware, Kirsty, and probably your listeners as well, inflammation is a huge, huge factor when it comes to trauma.

We know that people who have experienced trauma are far more likely to experience an inflammation driven condition like chronic fatigue as well, like long COVID, like all of these conditions that people really appreciate the service of you and your colleagues for. They're more likely to be in an inflammatory state. And when we take that back and we look at, well, what's the relationship between the microbiome and inflammation?

We know that microbial communities, the microbiota, directly influence chemokines and cytokines. And then we have neural pathways. So the vagus nerve, the enteric nervous system can also be impacted by the composition of the microbiome and the metabolites produced by the bacteria which live and thrive in our intestinal environment. When we are stressed, the HPA axis regulates cortisol secretion and cortisol itself can influence the immune system.

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So, for example, cortisol levels can influence the secretion and cascade of different cytokines leading directly to inflammation. And again, this is something that I know your patients and people in the community experience directly, when they are stressed and unhappy, they often experience flare ups of old injuries or pain. Pain and mental health conditions go hand in hand and a big part of that is, potentially, cortisol release stimulating cytokine imbalance.

When we are stressed, we also see altered gut permeability. So this is when if we think of the lining of the digestive tract as a nice kind of tight tube, when cortisol levels are elevated, we start to see that tube becomes, the lining of that tube becomes, more permeable, which can alter barrier function. And this itself can have an influence on infection risk in the patient, but can also alter gut microbiota composition.

Likewise, gut microbiota composition can influence the levels of circulating cytokines which can then have a negative impact on the central nervous system function. If we bring in the vagus nerve as well, the vagus nerve can often be modulated by systemic tryptophan levels. And tryptophan levels can be influenced by the presence or absence of particular microbial communities in the gastrointestinal microbiome. Some of these communities are known to produce neuroactive microbial metabolites.

So some of the short chain fatty acids, which are produced when our gut bacteria feed on our diet, can influence the functioning of the central nervous system and neurotransmitters through the production of serotonin precursors. So that's a really long winded way of saying everything is related and everything is affecting every other part of our function when it comes to mental well-being.

Kirsty Cullen

It's absolutely central, isn't it? And I know that we have neurotransmitters produced in the gut and those neurotransmitters can potentially have an impact on the hippocampus and the amygdala and those are areas of the brain which are going to have an impact on anxiety-like behavior. Isn't that right?

Rebecca Edwards

Yeah. There's still a lot of conjecture around the function of gastrointestinal produced neurotransmitters because, and I think we may have touched on this the last time you and I had an interview like this, there is more serotonin produced in the digestive tract than there is in the central nervous system. But we don't currently believe that that gastrointestinal derived serotonin can cross the blood brain barrier and enter the central nervous system.

Where we think it has an influence on mental health, and it does, is through its ability to impact gastrointestinal motility. So when we talk about motility, we're referring to essentially the muscular contractions that move the contents of the gastrointestinal tract through the rest of your body. When the gastrointestinal motility speeds up, this alters the speed at which your food and other gastrointestinal contents are moving through.

And this can alter the production of those short chain fatty acid metabolites and actually have a really significant impact on the composition of the microbiome. So a microbiome which is over or

under-producing serotonin and other neurotransmitters may indirectly modulate the neurotransmitters in the central nervous system by altering the composition of the microbiome. But really we're in the infancy of understanding the relationship between the microbiota and neurotransmitters. And I would say watch this space. There's a lot yet to be uncovered.

[00:18:46] Kirsty Cullen

Fantastic. We'll be diving into that research as it appears. Now, I know, Rebecca, you guys use a great diagram, a great illustration, which I'm going to pop into our talk here, which demonstrates, illustrates that sort of microbiome gut brain communication in both directions. I think you've got it there in front of you also. I wondered if you'd like to talk us through that because I think, in a nutshell, it says everything that you've just communicated.

Rebecca Edwards

Yeah, it really does. And you're right to focus on this one because it really does just kind of encapsulate the various points that we now have a pretty good understanding about that bidirectional communication, again, the gut function affecting brain function and the other way around. So if we start at the top, we've got our brain. Directly under the brain, we've got our digestive tract. And then under the digestive tract, those little kind of flowery looking things are our microbiota, the microbes which live in the digestive tract.

And we can see we've got arrows going both from the gut to the brain and from the brain to the gut. So if we start on the right hand side and we look at how the gut affects the brain, we can see there we've got vagus nerve activation. And we just spoke about that a moment ago, that certain microbial communities which reside in the microbiome can produce metabolites which can activate the vagus nerve and thus have an impact on sensation of well-being.

And also, if we then link back in IBS and gastrointestinal function, vagus nerve activation can be a really significant part of treatment for different types of IBS. So patients who are experiencing SIBO, for example, small intestinal bacterial overgrowth, can often find significant relief through physically stimulating the vagus nerve through different kinds of breathing. And we know that when microbial metabolites can stimulate the vagus nerve, this can be associated with a greater sense of well-being and improvement in gastrointestinal symptoms.

Then if we have a look at the production of neuropeptides and neurotransmitters like leptin, like serotonin, so leptin is a neuropeptide which is produced in response to eating. And it's one of the signals that goes to our brain to stimulate satiety or that sensation of pleasant fullness after a meal. How do we know when to stop eating when we've had enough? One of the things that puts the brake on our appetite is the arrival of leptin in the hypothalamus.

And leptin is produced outside of the central nervous system in response to eating and then travels into the brain. When we have disruption of the microbiome, we may see a disruption in the production of leptin and the passage of leptin through the blood brain barrier into the hypothalamus. And this may be another one of those factors which can disrupt appetite regulation and trigger certain cravings in people who are experiencing trauma or depression or other emotional symptoms.

We talked about serotonin and its impact on gut motility and potentially tryptophan precursors produced by the microbiome may have an impact on central nervous system serotonin balance and

may have a relationship with depression. Immune signaling, so, again, microbiota having a direct influence on cytokine modulation and this then links back into that overarching theme of inflammation.

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Barrier integrity. I mean, ultimately the composition of our microbiome is influenced by our diet, number one. And number two, the health of the gastrointestinal landscape. So how healthy is the actual mucus membrane lining of the digestive tract? How thick is the mucin protective lining? How able to support a diverse microbial community is your actual gastrointestinal environment?

And when we see poor barrier integrity, poor mucin thickness, we know we're going to see a less diverse microbiota. And this then may link back in with inflammation, immune dysregulation and all of the factors we've talked about. The short chain fatty acid metabolites which are produced, butyrate would be the one we know the most about. And we know that butyrate production is associated with someone who is less likely to experience some of these mental ill health presentations.

Then if we flip onto the other side, the impact that the brain has on the microbiota, just to show that it really does go both ways, neurotransmitters, so, just as the microbiota influence the production of neurotransmitters, neurotransmitters will also influence, once again, that motility, that speed at which the gastrointestinal system is processing, which then will in turn influence the composition of the microbiome.

Neuromuscular control of peristalsis, very much linked with those neurotransmitters and we see that ourselves as well. I'm very sure that all of your patients and listeners have experienced something like anticipation diarrhea or very urgently needing to go to the toilet when in an acutely stressful situation. And this is when we've got that release of cortisol causing an increase in peristalsis and causing an urgent evacuation.

This then ties in with the fight or flight response as well. And a lot of IBS patients who I've worked with over the years have found that really working on nervous system health has helped to control especially the diarrhea aspect of IBS and the gastrointestinal pain. And then the secretion of mucus, which may be one of the most important factors altogether. When we see that word mucus and it sounds unpleasant and horrible and a symptom more than anything.

But mucus is a really important substance that, essentially, I love to think of as it almost forms a little nest or a home for your microbiome. When you have a nice thick layer of mucin, which is the protective lining of the gastrointestinal epithelial environment, it provides a source of fuel and protection for the microbes which make up your microbiome.

And so having a healthy layer of mucus on the mucous membrane can be significant in providing a home for a diverse and healthy microbiome. So, once again, I've waffled on way too long, but it is so important to look at this two way communication, and, really, three way if we bring in the microbiome at its own organ as well, which some researchers have suggested we start to talk about the microbiome as its own organ.

[00:25:48] Kirsty Cullen

Yeah, superb. And I think what's so interesting about this particular diagram is that trauma, mood disorders, they're impacted by brain dysfunction. There's an impact on the gut brain microbiome axis, the hypothalamic pituitary adrenal axis, that you said, and also the immune systems. We see all of those things at play and all of those things are reflected here in that diagram. So it just goes to show the intricacies of the whole system.

So what I want to talk about next, Rebecca, if I may, is you mentioned pathobionts. We're talking about sort of this balance between the various phyla. I'm wondering, because we have that kind of imbalance starting to occur, is there a risk, or an increased risk, for more pathogens, as well as the pathobionts, but more pathogens or opportunistic infections in the gut, is that seen at all in the research in terms of trauma?

Rebecca Edwards

It definitely is. We know that across the board, sufferers of trauma or people who have experienced trauma are more likely to present with a whole range of infections. And there was a really interesting study, actually, that I was looking at and thinking, oh, I know this is a really small study, but I would love to see more of this happening in the future. Where patients who were admitted to A&E after an acute trauma or an accident were found to have a significant impact on their microbial composition within 72 hours of experiencing that trauma.

So the way the researchers went about this, and it really was just a pilot study, was they had ethics approval to take microbiome samples actually in the trauma rooms, in A&E, and they took them via rectal examination. When patients were first brought in with trauma, what they found was that there was, and they compared the microbiome analysis of these patients who had experienced trauma and in this case we're talking physical trauma, largely, we're talking about being in an accident or experiencing a hugely traumatic impact to the body which has landed someone in Accident and Emergency.

They then compared these microbiota analyses with a control group who had not experienced trauma. And what they found was that at baseline, so at the time of taking the first samples, there wasn't a huge difference between the two groups, but there was a significant change in both phylogenetic composition and relative abundance after the first 72 hours after this traumatic injury.

So this is a really rapid change in a really important part of our body's immune system, digestive system, endocrine system, et cetera, that may actually represent the beginning of a really critical piece of research that may help us to understand what happens to us after a severe trauma. So, as I said, we can't really draw any conclusions from this study yet, but I think it's a really fascinating early preclinical piece of work demonstrating that trauma has this significant rapid impact on our microbiome. And we're just, again, at the beginning of understanding what the consequences of this could be.

Kirsty Cullen

It would be so amazing to understand that in more depth from a clinical perspective in terms of how we might offer support. And that kind of brings me to the question, actually, Rebecca, obviously we're looking at this link between trauma and IBS, and I'm wondering, is there any suggestion, then, that maybe as clients are starting to work through their trauma, so maybe they're

in therapy, they're in clinic, they're working with a practitioner, and they're working through some of those traumatic events, clinically, is there any suggestion that that work itself might impact on the gut? Are we expecting to see an increase in gut related symptoms as a consequence?

[00:30:10] Rebecca Edwards

It's a really, really good question and I think it's something which I think would be very hard to construct a very black and white methodology for clinical researchers to follow. But I think we've got enough dots that we can draw lines between to develop a hypothesis of understanding there. I think we can really... It's something that I love to talk to practitioners about, is how can we support our patients on every level?

And we now know enough to be very sure that there is an intricate connection between the microbiome, gut function, and that layer of mental and emotional wellness that if we are working deeply with someone on that mental health level, why on earth would it be a surprise that this may impact the gastrointestinal health as well?

Kirsty Cullen

And I know certainly, clinically, it's been my observation, working with clients with SIBO, with small intestinal bacterial overgrowth, who then subsequently start to go through a traumatic experience, my observation is that they don't handle that clinical work as well. They may be more reactive to it, responsive to it, sort of the use of antibacterials.

So there is a shift there that potentially as clinicians, we can work to support in advance if we're kind of forewarned and forearmed, as it were. And with that being said, I wanted to have you discuss with us the benefits and the therapeutic use of live bacteria in clients with trauma and how you might go about using that.

Rebecca Edwards

Yeah, well, it's obviously because I work in a space of research around probiotics, I'm a big fan of using probiotics, but, always, the first thing to get right is you've got to know the specific strain of live bacteria that will be beneficial for your patient. We've moved on so far in the world of probioticology in the last 15, 20 years. Certainly, I remember 20 odd years ago, when I was a student myself, the idea that any live bacteria supplement was good, what made it more powerful was having a higher number of live organisms in it and you could just kind of use a broad spectrum mix for your patients and kind of hope for the best.

And we've moved on so far from there. We now know that the dose of live bacteria is far less significant than the strain specificity and it all comes down to the individual actions of individual strains and we're so better equipped to choose the right strain for the clinical presentation in front of us. So the very first piece of advice that I always give any clinician or any patient is make sure that you can access the published research on the specific strains you're looking at that you can see what they've actually been proven to do in people who have a similar clinical presentation to you or to your patient and that you are choosing the right strain for that presentation.

So when it comes to something like symptoms of IBS, which are co-occurring with trauma or with stress or with anything related to the nervous system or mental health, you're going to want to

make sure you're choosing strains or a combination of strains which have been trialed in a population of people experiencing these symptoms.

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And not all strains of live bacteria have. Not all strains of live bacteria have been found to have any association with mental health presentations or even IBS at all. So my very overarching piece of advice is choose the strains which have actually been trialed for the symptoms you are addressing in a group of people who are similar to your patient.

Kirsty Cullen

Yeah, absolutely. And before we dive into what some of those strains might be, I wonder if you could explain, because I think this is really important, the different measures that might be used to assess how many useful live bacteria there are in a probiotic capsule. Because there are a couple of measures, CFUs and BLB, I wonder if you could explain the difference?

Rebecca Edwards

Yeah, sure. So when you look at a box of live bacteria as a supplement, one of the first things that you'll see, apart from, you know, what strains of bacteria are actually present, is how many units of bacteria are present. And as you pointed out, Kirsty, that can be expressed in mainly two different ways. And it's going to be a big number because they're so tiny that we tend to give them in the millions or billions.

And as I said before, it's not necessarily the case that a higher number of live microbes gives a better result. We've always got to check what's actually being used in clinical trials, what doses, but most importantly, what strain. But when you're looking at that number, you'll notice that it's expressed as, say, 1 billion CFU, or 1 billion live bacteria, which may say billion live bacteria, or may say BLB.

And essentially, these are two different ways of expressing the same thing, which is how many individual live bacteria do you have in this capsule or in this sachet or in this dose? But the way they're arrived at is quite different. So CFU stands for Colony Forming Units. And to explain the significance of this, I'm just going to call back on something we spoke about a few minutes ago, which is the fact that our understanding of probiotics and probiotic science has changed so much in the past 15, 20 years or so.

Again, when I was a student, we used to think that when you took live bacteria, they would become part of your microbiome, they would grow inside you, they would form colonies, and they would recolonize or reseed your microbiome. We now know and understand that that's not what live bacteria supplements are doing. They actually don't become permanent residents in our microbiome, in our digestive tracts. They're what we call transient colonizers.

They're here for a good time, not a long time. They pass through the digestive tract, interacting with the immune system, the nervous system, the endocrine system, all of those things we've spoken about during our chat today. But they ultimately leave. They don't form colonies. They don't settle in and raise their families forever. And so, the way that researchers used to count the number of microbes that are present in a live bacteria supplement, they used to grow a sample

from a probiotic product in a petri dish medium and look under a microscope to see how many individual cells had started to form colonies.

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These were then called colony forming units. And it was believed that you needed to have these particular colony forming bacteria to have an effective probiotic supplement. As our understanding has moved on and we now know and realize that we don't need to only select microbes which are capable of forming colonies, the way that we count what goes into our live bacteria supplements has changed.

And a lot of producers of probiotic supplements, live bacteria supplements, are now using a different form of enumeration called flow cytometry. And this is a lot faster to perform than the old fashioned plate count method where you're actually counting the individual microbes forming colonies. This is where a bacterial sample is passed through a high tech instrument called a flow cytometer, where essentially the individual cells of bacteria pass through a tube single file.

They have different laser beams kind of fired at them from different directions. I just absolutely love talking about this with kids. Who doesn't love laser beams? And the laser beams, they measure several markers of active metabolism. So they measure the health of the membrane which surrounds the bacterial cell, they measure the size and they measure its electrical status.

And what this means is that using a flow cytometer, you can very accurately count the number of live bacteria and you can separate the number of healthy live bacteria which are the right shape and size and have the right electrical impulses on an intact cell membrane from damaged cells. And you then have a very accurate understanding of the number of live and viable bacteria which are in a product which you then may swallow, and they then go on to interact with your immune system, digestive system, and all of the other systems.

So when you see a probiotic product or a live bacteria product which bears the terminology billion live bacteria, or BLB, or in some parts of the world, it's expressed as AFU, active-fluorescent units, this is an indication that you are taking products which, let's just say, a lot of love and care have gone into because it certainly is an investment passing your products through flow cytometry. But you have a very accurate understanding of the number of live viable bacteria that you are swallowing.

Kirsty Cullen

Fantastic. Really good advice and I think really important when you're looking to invest or where you're discussing with a practitioner what the best support might be. So let's dive into the specific species that you mentioned. So, obviously, if we are supporting the gut, we want to make sure that we're supporting it in an accurate way in relation to cognitive health and well-being, mood balance, obviously trauma sort of being a specific aim of therapy.

And I know that there was some really fantastic research by Morata et al, which looked at specific bacteria and their ability to impact on low mood and cognitive fatigue and sort of psychological acceptance. Could you tell us a little more about those particular species and how we can use them?

[00:40:34] Rebecca Edwards

Sure. So it's a combination of four specific strains. One is a plantarum strain, there are three lactobacillus strains so they come from the genus lactobacillus, and one strain of bifidobacteria. And they've been trialed together in, actually, multiple clinical trials now. And I'm very excited to be able to tell you that down here in Australia, a long clinical trial has just come to its conclusion on this combination of live bacterial strains.

So the study that you're referring to, the Morata study, was published in 2019 and that's still relatively recent in the world of clinical research publication. But it's very exciting that researchers led by Professor George Moschonis at La Trobe University in Melbourne have just wound up a long clinical trial looking at this combination of strains in a population clinically diagnosed with subthreshold depression. And we wait with bated breath to read some of the outcomes that Professor Moschonis and his team will come up with.

But I can tell you a little bit about the individual strains in this combination because there's actually a really fascinating tie back to the topic we've been discussing in our chat today. So there's a strain of lactobacillus plantarum, LP01. There's lactobacillus rhamnosus LR06. There's bifidobacterium longum 04. And lactobacillus fermentum LF16.

And again, just to echo what we were saying earlier, whenever you are reading any research on live bacteria strains, you need that whole long name there. You need the genus, lactobacillus or bifidobacterium. You need the species, planetarium or rhamnosus or fermentum or acidophilus. But you also need the strain. So lactobacillus plantarum, LP01, which is what we have in this particular combination, which we use as activated probiotics, Biome Lift, we actually use five different strains of lactobacillus plantarum across the whole range of activated probiotics.

And that is because each strain of plantarum is doing something different. So the reason that the LP01 is used in this particular combination we're discussing, Biome Lift, is because it's actually on top of being proven to have these mental health benefits, it's also an excellent IBS strain. And this just ties together everything we've been talking about, that we cannot separate the symptoms of IBS, irritable bowel syndrome, which are related to functional presentation of the digestive system, we can't separate that from stress, from anxiety, from trauma, from sleep, from cognitive function. So it makes perfect sense that this is a very well evidenced IBS strain, which is also showing clinically proven benefits in the mental health space as well.

Kirsty Cullen

Superb. Absolutely fascinating. And let's just move away from probiotics for a moment. What is it that we can do around the diet, generally, just to support the microbiome knowing that we've got this intrinsic link to mental well-being and health?

Rebecca Edwards

Well, there's really one word that sums up what we can do, and that's diversity. It's the diversity that we're aiming for in the microbiome. And the way we get that is diversity in our diet. And another way you can look at it is we sometimes talk about the microbiome inhabitants as the microflora, and that word flora is really important. You can almost think of them as a type of plant or a type of garden.

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And the word plant is really important here because what feeds our microbiome, what feeds these bacteria, is largely fibers and other substances that come from plant foods. So the diet which is most supportive of a diverse and healthy microbiome is a diet which is high in plant materials. And this means a variety of plant materials, a wide variety. I always advise people to eat at least 20 different types of fruit and vegetables every week, if you can.

Because each type of plant food will contain its very own unique array of fibers which are all capable of supporting different microbial species and genera and phyla, et cetera, and even to the point where different species of apples contain different types of fibers and will support the growth of different microbial communities. So eat as widely as you can, eat from the plant kingdom as much as you can.

And I'm always a big proponent of bringing things into your diet, rather than taking things out, but also have a think about substances which may have a negative impact on our microbiome, like alcohol, for example. And again, to round this conversation out, stress and all of these other factors, although it's incredibly trite to say, oh, just avoid stress, if only it was that easy, it's not, but it's just, again, that really cementing that relationship between a healthy microbiome and a healthy mind.

Kirsty Cullen

Yeah, absolutely. So diversity through the diet, and research specificity through the probiotics, that's the combination for the people. Great. Thank you for joining us today, Rebecca, and sharing your insights. Fascinating, as always. If people would like to find out more about your work, where should I direct them to?

Rebecca Edwards

Come and visit our website, activatedprobiotics.com.au. The au is important because we are located in Australia and if you are a practitioner, you can sign up to the practitioner portal on our website, where you'll be able to access lots of exciting research that we are getting up to. If you're in the UK, we have a team of three beautiful souls working with Activated Probiotics in the UK and we now have gorgeous Linda, our team member in Ireland, as well. So any practitioners in Ireland or the rest of the EU can find Linda on our website as well.

Kirsty Cullen

Fantastic. And of course, if people want to link up with the Optimum Health Clinic for nutrition and clinical support, then you can also contact us via our website, which is www.theoptimumhealthclinic.com. Rebecca, thank you so much for your time today.

Rebecca Edwards

Thank you so much for having me.