## Introduction to membrane replacement therapy

If an individual is not getting enough phospholipids to support repairing their membranes, and what is the body going to do? It's going up-regulate cholesterol production.

We make cholesterol primarily in the periphery in a liver. Liver's gonna up regulate cholesterol, production that cholesterol gets carried on LDL particles.

LDl is going deliver cholesterol to the cell so that you can repair damage where there's damage in membrane. And that's the beauty of supporting with phosphatidylcholine as well, where a phospholypic complex like the Body Biopc because when you supply the body with adequate amounts of phospholipids, you're regulating that entire cholesterol feedback loop.

Welcome to The Natural Heart Doctor Show. I'm cardiologist Dr. Jack Wolfson. Heart problems don't come from a drug deficiency. They come root causes where cardiologists never look.

On this show, I sit down with experts who challenge the mainstream rhetoric and talk about what actually builds a heart built to last. Get ready for a dose of cardiac longevity.

Welcome to another episode inside the heart attack and stroke prevention summit. I'm one of the hosts, Dr. Jack Wolfson, cardiologist, and today I am really excited for this conversation that is going to be new to a lot of you.

But I have Justine Stanger here and she received her degree from the University of Alberta. She is currently recording this down in South Africa. So it's summer down there.

She looks nice and tan and nice, and healthy as opposed to being back home in Calgary at this time of year. And then she went on to pursue a degree in holistic nutrition.

through Bauman College, and then she also completed her functional medicine training through the Institute for Functional Medicine and is a certified functional health coach.

And she was actually worked under Dr. Bruce Hoffman, who is one of the well-known holistic practitioners for many, many years. And she's worked a lot of his complex illness patients.

And I tell you, I've never spoke to Justine, but she spoke a to a of my staff and my doctors over here at Natural Heart Doctor, and they're just so impressed with your knowledge.

This presentation is sponsored by BodyBio, And we'll be talking about some of Bodybio's products as well. The intention, of course, is to give you the best information possible.

So Justin, welcome to the Heart Attack and Stroke Prevention Summit. Thank you for having me. I'm very excited to be here. I'm excited about this conversation too, because I've been delving into this, you know, the last couple of years, again, after, uh, just, reading and learning and this whole concept of membrane replacement therapy, um, Why don't we see it off there?

What are the membranes that we're talking about and why do we need to replace them? That is a good way to start. I think let's start by just explaining what our membrans are comprised of and maybe just talking the significance of cells within the body.

We are made up of 37 trillion cells. And we have about 200 different cell types. We also have over 500 trillion mitochondria.

## What cell membranes are made of

So when we think about the body, the, body is compartmentalized from cell to cell with these biological membranes that are predominantly comprised of phospholipids.

And we have that same level of compartmentalization actually inside the cell as well. All of the different organelles have these biological membranes.

And if an organelle doesn't have a membrane, it's interacting with one. So the membrans are really, really significant. When I say phospholipids, if we break it down to a really beginner level, we all know that we macronutrients.

There's protein, fats, and carbohydrates. Then we had micronutrians, vitamins, minerals, trace elements. The phospho lipids would fall under the category of fats.

And so we do make these in the body, they are considered a conditionally essential lipid because we need to consume essential nutrients in order to synthesize phospholipids.

So within the categories of macronutrients, vitamins and minerals, we also have essential nutrient and some of those essential are essential fatty acids and we actually only have two of them.

linoleic acid or omega six and alpha linolenic or the plant based form of omega three. Now we can get into whether or not I think the downstream metabolites are also essential.

I do believe that they're also essentially just considering how inefficient the enzymes are in converting our parent oils to the downstairs metabolite.

And I know that you agree with this. You would never tell somebody just to consume flax seeds. to support DHA levels. We want to make sure that we're consuming caviar and good quality wild fish.

Now, the phospholipids are making up the cell membrane. And we have two lipid bilayers on every single one of those 37 cells and 200 different cell types.

On the outer membrane is primarily phosphatidylcholine. So phosphotidlycholene is the most abundant phospho lipids in the entire body. And it makes up roughly about 50 to 90% of the outer cell membrane.

Now, depending on the cell type that we're talking about, I know we are focusing on cardiovascular system here. So if you think about the endothelial cells, they're comprised of about 60% phosphatidylcholine.

Now we want to make sure that we are supporting phosphatidylcholine levels so that can support the structure, the function, and the fluidity of these cells.

Then in the inside of every cell membrane, we have another lipid bilayer that's comprised of three additional phospholipids. Phosphatidylethanolamine, phosphotidylinositol and phosphotytolyserine.

So obviously when we think about the very foundation of our health, We have to be sure we're supporting our body with these phospho lipids so we can maintain healthy cellular function.

And there's so many reasons why that's that so critically important and is really truly if we're looking at the very root of supporting an individual's health, we want to make sure that we are giving ourselves what they need to do the work that they were intended to.

And that is the beauty of using exogenous phospholipids. So an opening statement, thank you. What about, you know, because I've been teaching this for a while and I'm not going to say that I, I stand on the shoulder of many giants and can't even say where I heard this from initially, but the actual, the brains of the cell that people would

typically think is the nucleus.

You could ask any high school students and they would, what's the most important part of a cell? And obviously every part has function, but that the cell membrane is really the brain of the cells that decides what gets into the self, what stays outside of a cell, how cells communicate with each other, and how they communicate what things coming in, things going out.

And then also maybe comment on that and the importance again and reiterating that. But then I'll also talk about how there's another little sneaky thing that's part of this cell's membrane and that is cholesterol.

Another reason why cholesterol is so important. So maybe talk Yeah, so you're exactly right. Actually, this was there was a researcher prior to Bruce Lipton that brought this to the scientific forefront and then Bruce lipton was really the one that kind of made it public.

That the membrane is really, the brain of the cell. We all believe that the nucleus was regulating everything that was taking place within the sell. He removed a nucleus and maintained the membrane and saw that the cell still survived for weeks after the nucleus was removed.

The membrane is this dynamic living structure that has all of our proteins, all our peptides, our receptors, and all the ion channels. Everything is found on the membranes.

So if you think about the significance of that when it comes to all of these disease processes that we see today, this is starting on a membrane level.

We have a breakdown on the biological membrane, which ultimately, Jack, is going to the phospholipids interact. I don't want to go too much into the quantum world, but the phosphate lipids are really interacting with that exclusion zone water inside the cell.

So because of a phosphatidylcholine molecule, there's a polar head group, so a water loving headgroup. there's a phosphate group, it sits on a glycerol backbone which is a three carbon sugar alcohol backbone, and then it has two fatty acid tails.

## Cholesterol, membrane fluidity, and feedback loops

And those two fat acid tales are made from the dietary fats and oils that we consume. Those two Fatty Acid tails are hydrophobic and so the water-loving head is interacting with that exclusion zone water and if you know anything about that Exclusion Zone water in the cell, all of the Electrons are going to concentrate along that biological surface or along the membrane.

The protons are gonna get shifted away. There's a proton wire and we have this electrical gradient within the cell. Those electrons are generating a charge in the membranes.

So the phospholipids are critical and that charge is everything, right? Health is about having a strong electrical charge. When we lose that change, disease manifests.

And so that's also the important relationship that the phospholipids play more on that kind of quantum level than just the structure and function of every single one of those cells.

Now cholesterol is a critical component of our cell membranes as well. And a lot of people, I think, forget this. We've been fed so many lies about cholesterol.

And people believe that having high cholesterol is a bad thing. Cholesterol is inflammatory. There's all these narratives about cholesterol and we forget that it's a critical component of our cell membranes.

And the problem with cholesterol, is when we get excess amounts of cholesterol in the membrane and it interferes

with the phospholipid concentrations, which are going to impair the memory dynamics.

So you talked about the importance of cell to cell communication, signal transduction. All of that is going to be impaired if we don't have that optimal fluidity, the optimal membrane dynamics happening within the membrane with optimal PC levels and also optimal cholesterol levels.

But PC jack actually regulates the entire cholesterol feedback system. So if you think about this from an individual, if an individuals not getting enough phospholipids to support repairing their membranes, And what is the body going to do?

It's going up regulate cholesterol production. So we make cholesterol primarily in the periphery in a liver liver is going. To up, regulate, cholesterol, production that cholesterol gets carried on LDL particles.

LD is gonna deliver cholesterol to the cell so that you can repair damage where there's damage in. And that's the beauty of supporting with phosphatidylcholine as well, we're a phospholipid complex like the body biopsy, because when you supply the buddy with adequate amounts of phospho lipids, you're regulating that entire cholesterol feedback loop.

So that the, body knows we don't need to up regulate cholesterol production because we have adequate amount of these phospholypids to go in and repair the membrane.

What if your heart could actually get better, not just managed? What of your recovery didn't depend on adding more prescription drugs, but on finally understanding why your is struggling in the first place?

I'm Dr. Jack Wolfson, cardiologist at Natural Heart Doctor, and we believe heart disease isn't random, it's a message. It's message that inflammation, toxins, nutrient deficiencies, or lifestyle stressors are driving your symptoms beneath the surface.

That's why our approach goes far beyond the band-aid typical cardiology approaches. What we do is if we want to prevent treat and reverse cardiovascular disease, we help you develop a natural evidence-based plan to help your heart recover.

So if you're ready to move past fear, past confusion, and past just take this and wait, you deserve real answers. Visit naturalheartdoctor.com forward slash discovery and get the answers you've been searching for.

the answers that can help you achieve your best heart health. Your next chapter with a simple free discovery call should start now. So it really is like a phospholipid deficiency is what's happening and then maybe you would get that increasing cholesterol deposition etc in the cell membranes like you said decreasing fluidity and ultimately it all lines up in disease.

Why are people's Inherent phospholipids, maybe why are they deficient right out of the shoot, out in the vaginal canal, if you will. Why do the deficiencies may start then and how do these phosphatidylcholine, et cetera, how did they get damaged, the oxidative process, How's that all happening?

So we make phospholipids through two primary pathways within the body. So phospho lipids, like I talked about before, require essential nutrients. If we use phosphatidylcholine as an example, we have to consume choline and we to have consume essential fatty acids in order to synthesize phosphotidycholine to support our cell membranes.

So if you're not getting in enough essential nutrients, if your not optimizing your essential fatty acids, not optimising the ratios of essential fat acids your body is going to have a hard time synthesizing these phospholipids to support your cells.

But we make phospholypids through two pathways, either the CDP-choline pathway or the Kennedy pathway, through the de novo synthesis, and through methylation.

And that's through PEMT pathway where we take phosphatidylethanolamine and we convert it to phosphotidycholine to help support membranes. And that's actually a very demanding process, requires three methyl groups.

And so PC is a huge supportive tool for methylation as well, which a lot of people forget about. So when we have adequate amounts of PC, so we to make sure that we all these nutrients to synthesize them.

Now we live in a world where we're bombarded by all these toxic salts. And I've heard you talk about mold many times at different conferences.

## Why phospholipids become depleted

So we have mycotoxins, we had air pollution, We have pesticides in our food. We had a laundry list of things that were contaminated with every single second of the day.

Were living in non-native EMF soup, which we know directly impair that electrical charge of a membrane and impair the tunneling of those electrons through the electron transport chain or oxidative phosphorylation.

And so I believe that the demand, the assault is so high that, that body is actually not even able to keep up with the demands of repairing cell membranes, repairing mitochondrial membrane just because the damage is severe.

That's where I have said many times that I really believe supplementing with exogenous phospholipids, this is non-negotiable today. If we want to make sure that we're giving our body exactly what our needs to go in and repair, Damage to ourselves, we have to make sure that we're flooding it with these essential nutrients so that it actually has the materials to go in and repair cells.

Inflammation, you know, poor, redox ultimately when we lose that electrical charge. and our redox potential declines, then we're going to have inflammation.

We have all kinds of these reactive oxygen species that are going look for an electron to stabilize themselves, which they'll often steal that electron from the cell membrane, impairing the membrane more.

So then, we end up in just this really vicious cycle of continued membrane damage, and we don't have the materials to go in and actually repair that damage.

Okay, food first, I'm sure you agree. As you said, you can't live on all the flax seeds would not be the best option. You've mentioned seafood. I am a huge seafood guy.

Tell my patients, everybody will listen, including myself, eating seafood on a daily basis. Tremendous source of course of EPA, DHA. those end fatty acids, and you're talking about some of these kind of precursors to that and all the problems where there would be deficiency in the conversion ultimately leading to EPA, DHA.

And then also eggs, of course, are a fantastic source. Really animal products are going to be great there. So maybe just talk about those favorite food strategies as well as it relates to choline and really just membrane replacement and upkeep, if you will.

Animal foods, you're right, are the best source. Eggs are an excellent source of phosphatidylcholine. They're also an excellence source for choline and fat soluble vitamins, they're a nutrient bomb.

The only issue, so eggs, bread meat, dairy, fish, those are really great sources of Phosphatidylcholene. Then we have some of the plant foods, soybeans, sunflower seeds are also rich in phospholipids.

The problem arises with just the amount that we need to repair damage. So if you think about an egg yolk, Jack, an yolk has roughly 80 to 100 milligrams of phosphatidylcholine per large egg.

If you look at the bottle of The Body Bio PC, half a teaspoon of pure phospho lipids in liposomal form provides you with 1300 milligrams So we would have to eat about 13 eggs to get the equivalent of half a teaspoon of the body bio PC.

So, and if you knew the therapeutic doses that we use clinically, you would never be able to consume that many eggs and that much animal food to, get adequate amounts of these nutrients to support repairing cells.

So again, I have never personally seen somebody just lean into these phospholipid-rich foods to completely restore mitochondrial dysfunction and repair cellular damage.

And there may be an exception to the rule. I just think that supplementation through exogenous phospho-lipids today is essential. Well, I mean, certainly agree that, you know, because when people would say, well, why do I need to supplement if I'm doing all these things correctly from a food or sleep or sunshine standpoint and to, to what we talked about before, and we've talked a lot at conferences, the world is just so toxic and polluted on so many different levels.

And candidly, when would people say to me, can't you just do it with food? I said, for the first 35 years of my life, like I didn't behave so well. I got a lotta catching up to do.

and repair. How do you measure success with supplementation? What are those objective measurements that we can look at to say that this program is working or maybe someone would say okay well I'm going to try it with food first And then we'll see, okay, well, how do we show that person that that approach is either working or it's not?

I think just through assessing mitochondrial function symptoms. Symptoms is a great way. You know that if you have brain fog or you had fatigue or if have muscle pain or muscle weakness and there's a laundry list of symptoms that we could add to that list that you might have mitochondria dysfunction.

your mitochondria are not producing enough energy to support maintaining those systems in the body. And if we focus on the cardiovascular system, specifically the heart jack, the hearts requires six kilograms of ATP every single day.

That's an enormous amount of energy that's needed to help support, maintaining that system and maintaining health. And so I think just through symptoms is a really easy way when somebody starts to feel less brain fog, more energy, and more ability to think clearly and do the work that they want to do over the course of the day without feeling like they need a nap in the middle of day or they're in a cloud.

Those are really powerful indicators that you're supporting the repair of mitochondrial membrane and through supporting repair the membrane, you are improving that flow of electrons through the inner mitochondria membrane.

## Food sources and therapeutic dosing

Improving the production of water on complex IV, which I just talked about, acts like a battery within the cell, and improving ATP production, Which we all know as pre-energy.

Whether it is that or not, we'll be yet to be determined. All right, fantastic stuff there. And again, you talked about the exclusion zone and cellular water.

There really is fascinating stuff for people to kind of even pause the recording here and just listen to the stuff going forward and even just Google it or I've got some information on my website about some of these topics.

Uh, okay. But you just talked about subjective things. A lot of people are walking around. They're like, I feel fine. And they have maybe coronary artery calcification.

Maybe they've already had a myocardial infarction or stroke and they felt fine before, and maybe they feel find now,

but objective measurements. Um, cause there are so many people like that.

Yes. It's, it's always nice to see the woman with brain fog, uh, you know, fatigue, whatever complaints they have. And they start to get better, with this objectively objective measurements.

Uh, I'm a big fan of everything over at vibrance. I know you like some of the items that vibrant as well and vibrant can actually directly measure. choline levels, inositol levels.

Obviously, omega-3 fatty acid levels and ratios. What do you think? Or even just markers of oxidative stress or inflammation. Are we seeing changes there?

Yeah, sorry, I misunderstood your question. I was thinking just from how the patient would feel standpoint. There's so many markers that you can take a look at because phosphatidylcholine is a regulator of lipid metabolism.

So I talked about the role that it plays in regulating the cholesterol feedback loop. I talks about, uh, the rule that plays and supporting the parcell membranes, which is kind of the gatekeeper of supporting optimal lipids metabolism, but PC is also the main component of all of our lipoproteins, all our lipo proteins.

It's involved in the assembly and the breakdown of triglycerides. If you think about VLDL, The main components of that is phosphatidylcholine. When we think of HDL and HDl specifically, has a very high concentration of phosphatidylcholine.

And I was always taught that PC actually regulates that reverse cholesterol transport system. So for anybody that needs a refresher, HDL is passively removing cholesterol from the cell membrane.

It is a main component of LDL. Think about, Jack, small oxidized LDl particles. I immediately go to those particles don't have enough phosphatidylcholine to actually protect from oxidation.

And so we can support all of those lipoproteins through phosphotidlycholene supplementation. There are also potent antioxidants. I think that that's another characteristic that often gets missed from clinicians.

These are powerful, powerful antioxidants and are protecting those life proteins, protecting the cell membrane from damage. Love it. It's all so beneficial.

So useful. Um, and really still really fundamental. And it just, uh, I guess it's unfortunate even for myself that a lot of this information over the last few years, Uh, is kind of coming to light.

Uh and, really, you know, products like this stuff that body bio has in order to really. to work on these things. We've talked about food, obviously, we talked a little bit about supplementation.

People will ask about intravenous. You and I had a discussion before we started recording about IV FOS. Maybe talk about the roles of oral PC, phosphatidylcholine, and then also the role of intraveinous and the combination thereof and maybe some indications for those.

Yeah, and just to go back to you, so I didn't even finish answering your full question because the lipoproteins, you can oxidize LBL, triglycerides, HDL, those are going to be total cholesterol.

Those are gonna be beautiful markers to test after six months of using exogenous phospholipids. also methylation, homocysteine, because it's such a powerful support to methylated, actually the foundational support, to methylation.

So those are some easy ones. Creatinine is also a good one to look at just through the mechanism of supporting cellular hydration, the bond creatinines ratio.

There's lots of markers that you can look out if you want to get specific about seeing improvements after

phospholipid supplementation, Now your question about IVPC versus oral PC and the combination of them.

So this is as far as I understand is, and as as, I've seen clinically. There may be people that disagree with this understanding that I have. IV PC is an excellent tool to support detoxification to clear DNA addicts.

Clinically, we were running a test. out of Germany called the IGL. And on the IGL, it's epigenetic mitoquadrial test. So on I GL, there was a whole bunch of different panels that you could test for.

One, two of them, one of the show cell-free DNA, and one show DNA adducts. So those are toxins that are covalently bonded to your DNA either your nuclear DNA or your mitochondrial DNA.

And so IVPC does an incredible job of removing those intracellular toxins.

## Measuring progress with labs and symptoms

PC, because of then the characteristics of a molecule, it actually has the ability to work its way inside the cell and wrap itself around these fat soluble toxins and remove them from the cells.

And IVPC was used in hospitals long ago for drug overdoses, for alcohol poisoning because of the role that it plays in helping to support removing all of these toxins from the human body.

Oral phospholipid supplementation paired with IV is a powerhouse for supporting our cellular health because you're getting those detoxification benefits.

You're supporting the removal, the rapid removal of these intracellular toxins through using IVPC. And by including oral PC, you're taking in the liposomal form of the body biophospholipid complex.

So you are getting PC in highest quantities. Phosphatidyl ethanolamine, phosphatidylinositol, phospatidal serine, that's getting absorbed in a small intestine.

That's going into chylomicrons that are going to enter the lymphatic system and then into the bloodstream to directly go and repair membrane damage. This is the brilliance of the human body, right?

When we give the body what it needs to actually do the work that it was intended to do, really miraculous things happen on a cellular level. And so that's where, again, you get kind of a double whammy powerhouse.

When you are giving IV PC, especially Jack to a chronically ill person, IVPC paired with high dose oral PC. I do really want to emphasize the high-dose oral.

On the bottle of PC it says two capsules or half a teaspoon is a recommended dose. And clinically, many of these doctors that are using lipid replacement therapy as a tool in their practice are, using tablespoons of the lipids.

Especially in the beginning, right? As you're trying to get into that quick, you know, and obviously each patient is individual and maybe some people for maintenance, they would use less, but some of those people who are really sick and they are urgently needed to go to much higher dosing.

That's one of things my wife kind of taught me early on as well, when she opened up my eyes to health and wellness and some these natural you know, remedies, if you will, the dosing on the bottle isn't necessarily the right one.

Sometimes you got to go to mega-dosing on these things, which is certainly good. You mentioned before about homocysteine. Homocystein, of course, is a very important biochemical intermediate and levels that are too high are a problem, too low is the problem.

And then how you mentioned that the choline, that PC is very high in these methyl groups that help with the

methylation of of the body and therefore to process homocysteine to regulate that.

I think other markers there are like, you know, mean corpuscular volume, MCV, RDW, some of those things associated with the CBC are just like another tool to show people, hey, this is working as those numbers start to improve.

Mean platelet volume would be another one that I would think would great. So that's all fantastic. You know, cause a lot of people are walking around like me and they're like, Oh, well, I feel fine.

And why would I do all this? Why would take, you know? Cause this stuff isn't necessarily free. I mean, and you guys have the best product in the market and, You people will pay for that, especially at high dose.

Um, but, Hey, listen, we can only tell people, hey, this is the way to do it. Now you got to figure out how you're going to pay it in that scenario. But, um, truth be told, obviously it's not crazy expensive compared to some other stuff that doesn't have that data behind it, Two things that I want to, first of all, if you look at Dr.

Doug Wallace's work, so he is the lead researcher in the field of mitochondrial research. And he shows that all these people that you're talking about that are walking around symptom-free, he showed that there is a kind of threshold.

So an individual with 60% or 65% mitochondria heteroplasmy, and so those are mutations within the mitochondrion DNA, they will be symptom free. They will think that they're perfectly fine.

and then they work their way up to about 70% heteroplasmy and they start to manifest symptoms. So you have some whispers that your body is saying, we don't have enough energy to support these systems in the body.

Then you move to 80% heteroplasmy, and that's when disease manifests. So I always remind people that we don't want to wait until we have the symptoms and the disease is manifesting.

We want make sure that were supporting ourselves long before because the PC is so critical and all these phospholipids are so critically when we think about the mitochondrial membrane Jack.

Phosphatidylethanolamine is the main phospholipid that's found on that inner mitochondrial membrane where oxidative phosphorylation is occurring. That membrane, rich in phosphatidylethanolamine, is synthesizing the cardiomyocytes, that other phospholypit that sits on top that is housing complex I, complex III, and complex IV.

And speaking of essential fatty acids, the cardiomyocyte, four of those fatty acid tails on the molecule are linoleic acids.

## IV phosphatidylcholine and oral supplementation

Linoleic acid is such a key player in supporting the cardiolipin and the overall mitochondrial function within the heart. So we want to use phospholiphids as a supportive prevention so that we don't have 70-80% heteroplasmy accumulate.

And then obviously we can also use PC as as supportive treatment as well. for cardiovascular disease, but you'd mentioned methylation. So, phosphatidylcholine is a key player in methyulation pathways, and it's for a number of reasons.

Through the involvement of the hepatic synthesis of S. adenomythionine, or SAMe, the universal methyl donor. So PT is involved in the synthesis of that.

And then it's synthesized through the CDP-choline pathway or through remethylation of phosphatidylethanolamine, and that's via the phosphotidylethenolamine N-methyltransferase pathway, or people will know that as the PEMT pathway.

So that pathway consumes SAM. I mentioned that there's three methyl groups that need to be donated in order to convert ethanolamine to choline. And that is tightly linked to the metabolism of homocysteine.

So we know that that's a byproduct of these methylation reactions, right? And when homocysteines gets elevated, that a direct risk factor for endothelial dysfunction and for cardiovascular disease.

By supporting methyltion, supporting homocystein recycling through that folate and vitamin B12 dependent pathway, PC is going to help to maintain normal homosystein levels.

Really reducing the risk of arterial damage and promoting cardiovascular health. Absolutely fantastic. Fantastic deep dive into biochemistry in there.

Justine, very impressive. Exciting stuff. So tell me a little bit more about the products at BodyBio to maybe tell us about some of the product and some the offerings that you guys have over there and what's the next step for people to take as they're listening to this?

Yeah, so you mentioned before that the body biofossil lipid complex is the best product on the market. And I will say that it was because of their product that I got into this whole field of studying phospholipids and fatty acids.

So yes, it is absolutely the first product in the marketplace and that's for a number of reasons. The body biophospholibid is in liposomal form. I explained how that gets absorbed in your body.

It's not going through the process of digestion. most phosphatidylcholine supplements are. So most, and I would say pretty much all, of the phosphotidylecholene supplements on the market are either triple lecithin or lefthin.

And that is going to get broken down through the process of digestion into choline and fatty acids. Then you have to take those essential nutrients, put them back together to synthesize phospholipids through those pathways that I talked about.

That's not the case with the body biophospholiphid complex. Second of all, the concentrations of phospholipids are almost identical to your cell membranes.

So the phosphatidylcholine to ethanolamine to inositol to serine, there's a little bit of phosphateic acid in there as well, and that's involved in the synthesis of So we're delivering these nutrients to the cell in identical concentrations to your cell membranes, which is what we want.

And I could give you lots and lots of examples as to why we don't want to be giving high doses of one phospholipid to individuals, uh, we see a lot through phosphatidylserine product or supplementation, right?

To support lowering cholesterol or lowering cortisol and When we have excess levels of phosphatidylserine, what happens is the cell membrane is going to flip.

It's going induce cell death because phosphatoid serine is a signal for apoptosis. So we don't want to be delivering really high amounts of one phospholipid to the body.

We want be giving the bodies phospho lipids in concentrations that are mimicking our cells. And the purity of the product is BodyBio does the most outstanding job of making sure that they are getting the very best product to their customers.

And it's one of many reasons why I love this company. They have so much integrity and you don't see that a lot out there. So I feel very proud to represent them and I will say I would not be representing them if they weren't such an outstanding company and delivering such a phenomenal product that is so foundational to supporting human health.

Fantastic. Then we have a couple of other products as well. The body bio products, there's many now in the lineup,

but if we're focusing on the cardiovascular system and really membrane replacement therapy, like you mentioned, we want to focus on delivering phospholipids and essential fatty acids.

And so there's two options for essential fatty acids. BodyBio has a balance oil, which is a combination of those two essential fat acids that I spoke about, linoleic acid and alpha-linolenic acids, so those are our two parent oils.

Those are the two parents oils that are going to get converted to downstream metabolites, and they're very, very important signaling molecules. And I will say, poor linalic gets so much demonization because of what we've done to linaic.

And it is the most abundant fatty acid that's found within our cell membranes. And I mentioned that it's absolutely critical for healthy heart functioning because of the role that plays in the cardiolipin.

So we don't want to be deficient in essential fatty acids. Of course, we do not want be over-consuming linoleic acid and especially we want not to consuming it from any source of industrial seed oil.

And we also want to make sure that it's in an optimal ratio. So the optimal for cellular health is about a four to one ratio from linoleic acid to the omega-3 side, alpha-linolenic.

And that's exactly what BodyBio provides, the balance oil provides. There's no hexane, no solvents, not bleaches, nor deodorizers.

## BodyBio products and supporting fats

It's a cold pressed oil. Every batch is tested for oxidation and every batch has tested it for plasticides. So, you as a consumer or as practitioner need to make sure that you are educating your patients on proper use.

They never want to heat it. You want keep it in the freezer or in a fridge. It needs to be used only in cold application. And Jack, I know we talked about this before we started recording, but you do want make that sure you don't prolong the life of the balance oil.

I recommend using it within 30 to 60 days max. And that's really easy to do if you're using about a tablespoon a day to really support as an insurance policy, just to make sure that you are supporting those essential nutrients, not overdoing it, but supporting both sides for optimal cellular health.

And then the evening primrose oil is also an excellent tool to support essential fatty acids. It is a combination of linoleic acid and gamma-linolenic acids, so that is the first downstream metabolite on the omega-6 side.

And that, for cardiovascular disease, is so significant because DGLA or GLA goes into GDGLa, which is dihomogamalinolenic acid, Which goes directly into PG1311.

So you see in the literature, very low levels of di-homo-linolenics acid are implicated in cardiovascular diseases. It plays a significant role in helping to modulate the immune system.

Many people think omega-6 is inflammatory. That's not true. Omega-6 is not inflammatory. It can create pro-inflammatory phytokines, prostate glandins, in certain situations.

And we need that. We need to make sure that we are able to mount a healthy immune response. But it's also very anti-inflammatory. So I love the evening primrose oil to support GLA and to the support the conversion to diphomolinolenic acids.

Excellent, excellent. What about, now you guys also have a butyrate product. what about butyrate supplementation? Yeah, butylate. Oh, and we also had a fish oil.

So I am right there with you. Whole food always first. I'm a huge fan of individuals eating seafood for all the myriad

benefits that seafood provides.

And I do believe that BodyBio has the best fish, oil product on the market because it's not actually a Fish Oil. It's derived from herring roe. so the EP and DHA are in phospholipid form, which is the way that we want them to protect them.

oxidation and also to get integrated into the central and the peripheral nervous system as well. And butyrate is another fabulous tool, Jack. It's a short chain fatty acid.

So it's four carbon chain, fatty acids. Most people know a buterate through being made through the fermentation of dietary fiber. We also make it through many other pathways as but we can focus on it getting made through the fermentation of dietary fiber.

It's the number one fuel for our colonocytes. it has antifungal activity, it have anti-inflammatory activity it supports liver health, and acts as a chaperone molecule so that the protein or molecule that can actually go in and break down misfolded proteins, mis-fold lipids, It has those characteristics as well.

Tons of neurological benefits. when it comes to butyrate can calm down primed or activated microglial cells. It's really good for people that have neuroinflammation.

it supports the blood brain barrier. The benefits of butyrite are, it's a long list. Excellent. Well, thank you so much for on your vacation for this conversation.

And you know, you, with the sun. and nature in the background whenever people talk about the sunshine and how sun causes cancer and damage and it's you know you look at it like well obviously that doesn't make sense the sun is you, know God is the source of all life and and the Sun is is right there allowing to support all of the you.

Know the the mechanisms behind that and. How all these things work together so I think when people eat the right diet and are taking the. Right supplements now what it allows you to uh collect that energy from the sun our solar panel is nice and strong when everything is working all in together and that's just so so synergistic so uh justine thank you so much for this conversation brilliant brilliant stuff i appreciate you and the support of body bio you know for the summit and Dr.

Jack Wolfson with another fantastic episode of the Heart Attack and Stroke Prevention Summit. We'll see you next time. Thanks for listening to the Natural Heart Doctors show.

If this episode challenged what you thought you knew about heart health, make sure you follow the show so you don't miss what's next. And if you're ready for a deeper personalized approach, you can schedule a complimentary discovery call at naturalheartdoctor.com forward slash discovery.