Dr. Stephanie Seneff on Statins

By Dr. Joseph Mercola

DM: Dr. Joseph Mercola
SS: Dr. Stephanie Seneff

Introduction:

DM: Welcome, everyone. This is Dr. Mercola, and today I’m joined by Dr. Stephanie Seneff, who is a senior research scientist at MIT and fortunately has had a great privilege and opportunity to pursue an area of biological interest basically full-time, which will help explore some of these interesting topics that we are really starting to understand at a greater depth. So, welcome and thank you for joining us today.

SS: Thank you. I’m very happy to be here.

DM: Yes. Earlier this week, we had a conversation with Dr. Stephen Sinatra on an unrelated topic, ribose.

SS: Yes.

DM: But that discussion led into something that was really interesting. Because that was the first time that you and Dr. Sinatra had a dialogue, and that was on a phone call.

SS: Yes.

DM: But I thought we should do this as a follow-up to expand on some of the really important concepts that became elucidated. There were a number of them. But primarily, I think the groundbreaking story that virtually no one understands is that the number one drug used in the United States, at least by dollar volume, are the statin drugs. Lipitor is the number one, and statins collectively are the most widely used. They’re promoted to be used because of their beneficial effects on heart disease.

But extensively, the mechanism is to reduce the cholesterol, which they do, and is thought as the mechanism of they work. But then there’s another school of thought that believes that it’s their anti-inflammatory component that’s being more effective. But you and Dr. Sinatra both believe that both of those mechanisms are false. This is the breaking news.

So, why don’t you expand on that now and help elaborate on this? Because this is really an important and crucial distinction, as to some foundationally important physiological mechanisms that are heard to help us better understand heart disease.

SS: Okay. I would be delighted. I’ve been studying heart disease very seriously over the last several years, motivated by the fact that my husband was diagnosed with heart disease five years
ago. I have been really wanting to understand the mechanism in order for him to understand how to treat it and improve his life.

What I have discovered is that the key cause of heart disease, in my opinion, is actually cholesterol deficiency. This is the exact opposite, of course, of what we’ve been taught. And specifically, it’s cholesterol sulfate deficiency. It means a deficiency in both cholesterol and sulfate in the heart muscle. Both of these nutrients are absolutely essential to the functioning of the heart.

Now, the interesting thing is that the skin produces cholesterol sulfate in great abundance and is stimulated to produce cholesterol sulfate by sun exposure. One of the problems is that we avoid the sun, we use sunscreens, we’re not getting enough sun exposure, and therefore, we are developing over time a severe deficiency in cholesterol sulfate. Cholesterol sulfate supplies both cholesterol and sulfate to all the tissues.

You can see that over time, the heart develops this deficiency. And it is the purpose of the plaque to supply cholesterol sulfate to the heart. It actually has a positive purpose as function. The way to fix the problem is to make sure to get lots of sun exposure to the skin, as well as actually eating foods that are rich in cholesterol and eating foods that are rich in sulfur.

**DM:** What is the mechanism of the benefit or the value of cholesterol and sulfate to the heart muscles specifically?

**SS:** Very, very crucial, both of them. The cholesterol in the cell membrane, the cells in the heart, has these invaginations called caveolae, which are especially enriched in cholesterol. Those caveolae play an absolutely essential role in the contraction that’s related to the heart muscle beating. When there isn’t enough cholesterol, the heart becomes impaired in its ability to perform its job. That’s absolutely essential. The sulfate surrounds these heparan sulfate proteoglycans, which are these polysaccharide molecules that surround all the cells in the body.

These are important everywhere – extremely important. It’s something that researchers are starting to realize. Over the past 10 years, there has been a community of researchers who are studying these heparan sulfate proteoglycans. The more they study, the more they find very surprising things that these participate in to make the cells function properly.

They are really, really essential to the proper functioning of the cells, and they attach the cells at these caveolae. They’re involved with some very important things, such as breaking down cell debris. You need these heparan sulfate proteoglycans in order to digest and recycle proteins that get damaged by things like glycation damage. If you can’t do that, eventually your cells fill up with all these garbage basically that they can’t get rid of. That, of course, also causes them a great deal of distress.

**DM:** Well, that’s well and good and an important component, but there’s a belief and understanding that lowering cholesterol seems to reduce the risk for heart disease. And perhaps we can expand on this.

**SS:** Yes.

**DM:** Because it’s somewhat of a myth.
SS: It is.

DM: Because cholesterol is an artifact of the problem going on. It’s not the reason why the people are having heart disease. So, if you can expand on that, then we can go discuss the really important topics of the statin use. There does seem to be some benefit. They do have some therapeutic value in the short-term. But then in the long-term, it’s a devastating disaster.

SS: Right.

DM: Because they’re basically substituting for this cholesterol sulfate.

SS: That’s right.

DM: It’s a really interesting process. Why don’t we expand on the issue of what led most of these scientists, researchers, and clinicians to buy into the hypothesis that lowering cholesterol reduces heart disease, and then justifiably so, using statins to inhibit the production of cholesterol?

SS: Right. There are many researchers who are investigating the statins and puzzling out, trying to figure out why they do in fact reduce… In the short term, they reduce the incidence mostly of small heart attacks – not the large ones, but the small ones. The question is, “Why do they do this?” It’s an immediate effect, and I believe it’s a biophysical effect.

Interestingly enough, what they are doing is they’re pretending to be cholesterol sulfate. It turns out that biophysically, statins and cholesterol sulfate have a lot in common. Both of them have a hydrophilic core molecule to which are attached these negatively charged anions that are kosmotropic. It’s a particular characteristic of these certain molecules that causes a structuring of the water. It’s very, very important in the cell membrane of the red blood cells. The red blood cells actually produce cholesterol sulfate, again, upon sun exposure.

If you give them statins instead, then the statins will fill up their membrane acting as if they are cholesterol sulfate in this property of building the structured water, which actually makes the red blood cells repel each other. It’s got the negative charge and also the structuring, so that the red blood cells don’t coagulate. You are basically facing problems with thrombosis in heart disease, which are basically blood clots. The blood clots are due to the problem with the cells sticking together.

Both the red blood cells and the platelets will tend to stick together if they don’t have enough cholesterol sulfate. But if you give them statins instead, then they’re happy. They’re happy in the short term, because now they’ve got something that looks a lot like cholesterol sulfate, behaves like cholesterol sulfate, and protects the blood from coagulating. And this I think is the key thing that protects from the heart attack.

These are the two things that people have suggested. Actually, others have suggested this possibility in the literature, but very few people have proposed this concept.

DM: This is a radical proposal now?

SS: Yes.
DM: Because almost nearly everyone believes that statins work by either lowering cholesterol and/or having some influence on inflammation.

SS: That’s right. In fact, aspirin and other NSAIDs have been shown specifically not to help heart disease at all, but in fact to hinder it or to make it worse. These are the anti-inflammatories. They don’t work. So, it shouldn’t be that aspect, because other things that have that aspect don’t work. And the same thing with lowering cholesterol: everything else that lowers cholesterol has not been successful in reducing heart attacks.

These two aspects of statins are not contributing to their reduction in heart attacks. But instead, it’s this biophysical behavior that’s an immediate effect of displacing cholesterol sulfate in the membrane and protecting the red blood cells from coagulating. The problem is they pretend to be delivering cholesterol and sulfate to the tissues, but they don’t do it.

DM: Yeah. And there are two important clinical observations that tend to support this biophysical characteristic that you just described. One is that if a person is suffering from a hemorrhagic stroke and is on statins, they do much, much worse, because the last thing you want to do is to have thin blood when you have a hemorrhagic stroke.

SS: That’s right.

DM: Secondarily, when people come into the emergency room acutely with a suggestion of a heart attack, and in the process of studying them and evaluating them, they’re removed from all drugs including the statins. They actually do much, much worse, because they lose their protective benefits – the deluding effect on the blood or decreasing the blood viscosity.

SS: Right.

DM: These are two strong points that really support this biophysical model that you’re proposing.

SS: Uh-huh.

DM: I think this is radically important.

[----- 10:00 -----]

It’s interesting in this discussion that it occurred to me really very clearly that one of the more powerful ways naturally to emulate this benefit, and may even be superior to that produced by the statins, is something known as grounding.

SS: That’s right.

DM: Where we’re connected to the surface of the earth, and there’s a free transfer of electrons into our body that actually increases what’s called the zeta potential or the electronegative charge that surrounds the cell membranes, particularly the red blood cells that actually repels them and then causes this thinning of the blood.

But when I mentioned this to you, it also occurred very clearly that one of the primary ways that the body can serve as battery or a capacitor to absorb this charge is through the sulfate molecule.
And that if we’re deficient in sulfate, the benefit that we get from grounding ourselves naturally by walking on the earth barefoot essentially is diminished when we’re sulfate-deficient.

SS: That’s right.

DM: I’m wondering if you can expand on that.

SS: I certainly believe that. I’ve been working very hard trying to understand sort of the body electric. I think it’s a very fascinating aspect of the body – the electrical aspect – that is absolutely crucial to the body’s health. When you ground, you’re bringing that charge in through this electrical system almost like an electrical network that your body has set up. And the sulfate anion is crucially a part of that electrical network.

I think essentially as you lose sulfate supply, you start to get short circuits all throughout the network, which will then cause a tremendous amount of health difficulties. Probably most of the problems that we’re seeing on the rise in modern society are due to this sulfate deficiency along with the cholesterol deficiency, which has its own set of issues.

DM: Yes. Can you maybe comment a bit on the primary confusion that relates to the belief system that statins are effective because they lower cholesterol? What do you think is the evidence that led these clinicians and researchers to follow that model?

SS: It’s really unfortunate, because some things hooked up, and they were very simple message. The fact is that high levels of LDL, the so-called bad cholesterol which is actually a lipid molecule that contains cholesterol inside that is carrying cholesterol to deliver it to the tissues, when those LDL particles are high, there is an association between that and cardiovascular risk. It’s actually not nearly as good in association as there is for some other things, such as elevated homocysteine.

Elevated homocysteine in the blood is actually a stronger risk factor for heart disease than elevated LDL. Interestingly, homocysteine can be converted into sulfate, and it adheres to the cell wall. I believe that that’s what’s happening in the artery wall in the plaque that the homocysteine is getting converted into sulfate. The cholesterol is being trapped, then combined with that sulfate to produce cholesterol sulfate, and deliver it to the heart.

Elevated LDL is a risk factor. The reason why it’s elevated is that the cholesterol sulfate supply is reduced. It gets back to the lack of sun exposure to the skin.

In fact, I’ve seen articles that talk about the relationship between weather, climate, and heart disease. And it’s extremely striking that places that are rainy and northern versus places that are sunny and southern have a tremendous, tremendous difference in the rate of heart disease, with the ones that are sunny and southern having tremendous benefit: much reduced heart disease risk.

This is why places like Greece have actually a very good life expectancy, despite having much, much lower medical expenses than we put up with here in the United States. They have a very healthy lifestyle as a consequence of their sunny and warm climate.
DM: What about the issue of oxidation? Because some people believe that’s actually the oxidized cholesterol that is actually contributing to the...

SS: Right. In fact, they’re right. Oxidation is part of the problem. The really sad thing about oxidation is that it’s absolutely essential to life, because that’s how you get your energy. You have to have oxidation. And it’s happening in the artery wall, because it’s not happening in the skin from the sunlight. Sunlight actually sets up superoxide ions. It’s something that is critically needed to make this cholesterol sulfate. The artery wall is producing superoxide in order to make a cholesterol sulfate.

Unfortunately, because it’s not being done in the proper environment (where it would have been done much more safely had there been the sun exposure), it’s causing the damage to the tissues in the artery wall, because it needs to be made there in order to deliver it to the heart, which will be in trouble. And if the heart is in trouble, then the body will be in trouble, too. It’s a critical organ that needs that supply.

I mean, it doesn’t make sense if you think about just trying to…If you’ve got a bunch of extra crud in the blood, and you’re trying to pile it somewhere in the arteries, the last place you would want to pile it is in the arteries leading to your two most critical organs, which are the heart and the brain. In fact, that is where the plaque occurs – arteries leading to the heart and arteries leading to the brain. The plaque is there because it serves an essential role to those two organs: to supply cholesterol sulfate to them.

DM: That is just fascinating, because I don’t recall you mentioning that before, that this oxidation is actually a really crucial part of being alive and healthy. The problem is it’s just occurring at the wrong site.

SS: That’s right.

DM: It should be occurring normally at the skin, when it’s exposed to sunlight.

SS: Yeah.

DM: And then the body has the capacity and the mechanisms to take care of the side effects of that. But because it’s not occurring there, it has to occur inside the lining of the blood vessel, causing all sorts of havoc and essentially creating these cholesterol mimetics or mimics.

SS: Yes.

DM: To serve the function of cholesterol sulfate.

SS: They only serve the function biophysically of keeping the red blood cells and the platelets from coagulating, but they don’t serve the function of producing the cholesterol sulfate.

DM: Oh, interesting.

SS: This is why you get in trouble. The longer you take a statin, the worse off you are in terms of the cholesterol and sulfate depletion.

DM: Sure.
SS: Which leads to things like heart failure, liver failure, kidney failure, Alzheimer’s, ALS, and all kinds of massive diseases, which are on the rise. I believe that the statins are significant component of that.

DM: And there are two specific mechanisms going on here. One is that they’re serving as the substitute for cholesterol sulfate, but also they have their own intrinsic damage, because they’re blocking really important pathways in the liver to produce these important biochemicals that our body requires. When those are deficient, you’re wreaking havoc in the body.

SS: That’s right. They’re interfering with an early step in the mevalonate pathway. And of course, cholesterol is only one thing that is produced out of that pathway. There are many other very, very important molecules that are interfered with by statin drugs, such as coenzyme Q10, which is a crucial antioxidant in the heart muscle.

The highest concentration of coenzyme Q10 is in the heart. You don’t want to reduce coenzyme Q10, because that’s going to interfere with the heart’s ability to protect itself from the oxidation damage. That’s just going to increase your risk of heading toward heart failure.

DM: Yeah, it’s just a giant mess we’ve gotten ourselves into. And unfortunately, the vast majority of people in this country are following that model, which we know is inevitably a disaster. There’s just no way around it. Eventually, they’ll come to that conclusion.

SS: Right.

DM: But the people watching this don’t have to fall into that trap. They know the truth now. They can follow simple models, which essentially involve exposing as much of your skin as possible to safe sunlight exposure.

SS: That’s right.

DM: To increase that cholesterol sulfate, make sure that you’re taking high-quality foods that are high in sulfur and cholesterol.

SS: Right.

DM: And grounding themselves and exercising. Basically, the steps that we recommend are for preventing and optimizing the treatment of all diseases.

SS: This really means hanging out at the beach, walking barefoot in the sand, eating the lobsters, oysters, and scallops at the beach. I mean, what could be better, right?

DM: Yeah, absolutely. You and I are both in the process of elucidating some of the mechanisms and recommendations for optimizing your sulfur intake, because I really think that is a massively important and crucial part of the equation that’s absolutely underappreciated.

SS: Right.

DM: And by improving that sulfur and sulfate concentration in our bodies, we can do magnificent steps to improve our health.
SS: Right. There’s another issue, which is that the current agricultural practices are depleting the sulfur in the plants. And so we’re getting much less sulfur than we used to out of plant sources.

DM: Yeah. There are two sources primarily: plant and animal.

SS: Yes.

DM: We need both, of course.

SS: That’s right.

DM: In fact, interestingly, the cruciferous vegetables, which almost everyone acknowledges as being some of the healthiest vegetables around, maybe the primary reason why they are so healthy is because of the sulfur and sulfate compounds that they have.

SS: I believe that.

DM: Yeah. That’s just a fascinating concept. In some ways, even if you’re optimizing it, having large amounts of these vegetables, and have high amount of sulfate source or vegetable source sulfate, you’re still going to run through the problems if you don’t have the animal sources of sulfate.

SS: And of cholesterol, of course. Plants contain zero cholesterol. Some people are I think choosing a vegetarian diet in part in order to avoid cholesterol, because they think it’s unhealthy.

DM: Yeah.

SS: But cholesterol is a very, very important nutrient. I would encourage everybody to eat foods that are high in cholesterol, such as eggs, lobster, oysters, etc.

DM: Absolutely. Well, this is a brief interview, and we just wanted to have you expand on these really important concepts that are foundational, really transformational, and I’m thinking of this as really one of the most important causes of heart disease in contemporary America and the world today. So, thank you so much for joining us.

SS: It’s my pleasure.

DM: And for helping us elucidate this really important piece of the puzzle.

SS: Thank you.