Dr. Gerald Pollack is a professor at the University of Washington. At the present time he is the leading authority in the field of water structuring.

Following is the full text of his TEDx talk titled “Water, Cells, and Life” at TEDxNewYorkSalon.

TRANSCRIPT:

Water, cells, and life. That covers a lot of ground.

But I want to be more specific. I want to talk about: Where do we get our energy?

Now, obviously, we get a lot of energy from food, but I’m going to introduce the idea that we might get additional energy from light.

Now, why do I raise this question? Well, I raise the question because nature commonly uses light to supply energy, for example, green algae, they photosynthesize – they take in light and the light creates energy.

And the same is true of some bacteria; they also photosynthesize. But what we know best, of course, is green plants.

So green plants soak up light and convert that light into chemical energy, and that chemical energy, then, drives whatever the plant does, the metabolism, growth, bending, you name it. And all of this works through water – the roots of the plant absorb water, and that water goes to the leaves, and what happens in the leaves is that when they receive light, they take the water that’s inside them and split the water into positive and negative – H+, OH-. This is the first step of photosynthesis, and it’s driven by light.

So you might say light creates this kind of battery with plus and minus. And the question is, are we also solar powered? Do we use light to get

some of our energy? And I'll show you that we actually do – we engage in the first step of photosynthesis, that is, the splitting of water into the negative and positive.

Mother nature, when she created us, hasn't forsaken this wonderful mechanism of using light to get energy. And I'll show you also that that leads to many insights in terms of our own health.

Everybody knows that our body is mostly water, and in our laboratory at the University of Washington, we're studying water, and we came upon something really interesting.

When water meets certain materials – these are hydrophillic, or water-loving materials, which means that if you have a surface and you drop the water, it spreads out instead of beading up the way it does, for example, on Teflon.

So what happens is that the water molecules split into the positive and negative, and the negative ones line up, as you see here, next to the hydrophilic material.

This negatively charged water is, in fact, a different phase of water. It's not even H2O, it's actually H3O2, is what we found. And we refer to this fourth phase, if you will, of water, that is beyond solid, liquid, and vapor, this fourth phase is semi-crystalline water, as EZ.

So what's EZ?

EZ stands for "exclusion zone." And the reason we called it exclusion zone when we found it is as this phase of water builds, it pushes out everything that's inside of the water, that is, solutes, particles, whatever; and so we called it, logically, "exclusion zone," and EZ, is, well, easy to remember.

So, essentially, this is potential energy because it's just like a battery of water. And all batteries need to get charged, and the question is, well, where does the energy come from to charge this battery? Your cell phone needs to get charged, it's battery, and this is another battery.

And the answer came from a student who was doing something that he was not supposed to do, so – He was carrying out an experiment, and this experiment is using some hydrophilic material and putting water next to it, just as I've shown you.

He took a lamp – the lamp was sitting right next to the experimental chamber – and just for fun, he shined the lamp on the chamber, and what he saw was really astonishing. He noticed that because of the illumination, the exclusion zone, or EZ, expands, and it expanded hugely.

And when he took the lamp away, it came back to its original shape, which is a thin band of EZ – you can see at the upper left running parallel to the surface, so.

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Well, it didn't take a rocket scientist to figure out that, you shine light, it gets bigger, and maybe the light is what's responsible, the photons are responsible for providing the energy to grow this exclusion zone.

So obviously, we were really impressed by this student's result, and we began to study different wavelengths of light, ranging from the ultraviolet, through the visible light, through the infrared light, and we found that by far, the most effective light was infrared.

Infrared is actually all over – it's hard to get rid of, and it's not just inside, it's outside too. And this is literally free energy – we learned about free energy in our chemistry textbooks, but this is literally free, it doesn't cost

you a nickle; it's there.

And because it's there all the time, it means that when you have water next to a hydrophilic material, you always have EZ water.

And of course, if you add more light, then the EZ grows, you see? So light is basically feeding the growth. So this feature, this light-induced separation of charge can also be used to get electrical energy from light and water. All you need to do, at least in theory, is stick two electrodes in – one in the negative, one in the positive – and you ought to be able to get electricity to light a lightbulb.

We've demonstrated that this is actually the case. You can see here, you flip the switch and you get the light.

So just as water behaves as a light-driven battery, cells actually operate much the same way also as a light-driven battery, something you perhaps never thought of. But think about the cell and what's inside.

So inside the cell, you've got large macro molecules, mostly proteins, and these proteins have hydrophilic surfaces, and of course, there's water, lots of water inside the cell. And so what happens is that there are exclusion zones, you have EZ water, which has negative charge. And the positive charges would be lying beyond those negative charges.

So, the reality is the cell is really crowded, with proteins mostly, and this negative EZ practically fills the cell. And what happens is that the positive charges are pushed out, and the cell is negative.

But, negative charges near each other, they repel; they want to get away from one another. And that tendency to repel constitutes potential energy. And this potential energy is basically released in the form of protein folding – that is, the proteins ordinarily occupy one configuration, but they

fold – they start this way and they fold into another configuration.

So for example, if this were a muscle cell, the proteins would be in one configuration, and they move to another configuration, and that's what is responsible for your muscle cells contracting, and it allows you to jump.

So, the way it works, it looks like this: on the left side, here is a typical protein in its extended form, and it's got EZ water around it. And what happens is the EZ water melts into ordinary water and the protein is able to fold.

But of course, it's got to go back to the original position, and what happens is it does as EZ water builds around it. So this is the normal function of a typical protein.

And on the right side, imagine what happens with no EZ. You see, with no EZ, it doesn't have the potential to get back to its original configuration, and so it's not working.

So your muscle, or whatever cell, is not working properly if it doesn't have EZ water. Of course, if you have some EZ water, then it functions, but not quite as well as if you have a full complement of EZ water. You have potential energy from the EZ, which drives the work of the cell.

Light, as I said, is responsible for building the EZ, and building negative charge, and that's what gives the cell its energy. And then the energy is consumed as these proteins do the work of the cell, your work, and fold if you just connect the dots between the two.

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So light is actually driving the work of your cells, or light is actually

driving your function. Well, also inside the cell are structures called mitochondria, and they're known as the energy factory of the cell, central for energy production.

How might that work in terms of the framework of what I've been presenting? Well, look at those membranes inside the cell.

Those membranes are hydrophilic surfaces. And, as I mentioned, next to hydrophilic surfaces, EZs build. So this is a perfect configuration for building EZs and negative charge, and contributing that to the rest of the cell for energy.

So, where do we get our energy?

Well, we get it from food, and obviously, we can get quite a lot of energy under certain circumstances. But we also get it from light, and the light is absorbed by the water, and that light absorption builds EZ and creates energy.

Should this matter to you? Well, yeah, I think so. Light matters for function, and therefore, for health; and water matters for function, and therefore, for health. Because they all build EZs, and the EZs are needed for proper function.

So, for your health, what builds EZ water in your cells? Well, there are a few things we can think about.

First of all, drinking water. Well, water is the raw material for building EZ water, and so, obviously, you need to be hydrated in order to function properly.

Green juicing – the juice is the inside of the cells of the plant. So you're basically extracting EZ water from the plant cells and putting it into your cells.

Good strategy, and that's why many integrative medical health professionals suggest that green juicing is the single easiest and best way to maintain your health, because of EZ, I believe.

There are some substances that are known through the millenia to be good for health, and these are just a couple of examples: turmeric, coconut water – we've studied a half dozen of these experimentally in the laboratory, and we found that putting a certain amount in the water, in the amount that corresponds to the amount that might be in your body, builds EZ.

It's not published yet, but we're onto it.

Sunshine – you go out in the sun, you feel good, you feel healthy, good to be alive. Well, light that you receive builds EZ. And the sauna is perhaps even more effective because the heat means that it's generating infrared light, and infrared light is what builds EZ powerfully and effectively, and that's why you feel good after you come out of the sauna.

And finally, grounding, sometimes called "**earthing**," connecting yourself to the ground. Well, you can do this by taking off your shoes and walking on the beach. And you feel good.

And why do you feel good? Well, it might be some psychological issue, but you're connecting yourself to the earth, and the earth has been known for a century to be negatively charged; it's a vast repository, a practically infinite repository of negative charge.

So you soak up this negative charge, which then builds EZ.

So are we solar powered? I think we are, like many other living species. And mother nature didn't abandon this wonderful mechanism of using light from the sun to give us energy and confer health. And the way this

happens, evidence is showing that this happens through splitting of water – just like the first step of photosynthesis.

So we undergo – not just plants – we undergo the first step in photosynthesis. Well, our cells need energy, just like cell phones need energy, and some of that comes from light, not just food, but light. And within limits, the more light we get, the healthier we are.

So seek the sun.

Thank you.

Recommended Book/Course for Further Reading:

The Fourth Phase of Water: Beyond Solid, Liquid, and Vapor