What Causes Water to Move Inside the Body?

Fluid circulations are necessary for life, but poorly understood and easily disrupted by things like the vaccine.

A MIDWESTERN DOCTOR

APR 29, 2023

One of the fascinating things about science is that while it is an excellent tool for discerning the nature of reality, it will simultaneously refuse to look at data with implications that challenge the existing scientific orthodoxy. So an unfortunate situation is created where science advances knowledge to a point but then reverses polarities and paradoxically becomes a barrier to that advancement.

An excellent illustration of this dynamic can be seen with water, and as a result, many of its properties are relatively unknown. One of the most important properties is that provided ambient infrared energy is present in the environment and a polar surface exists, water can assume a semi-solid state where it behaves like a liquid crystalline structure. Since a significant portion of the water within the body is in the liquid crystalline state, the biological consequences of this water, in my eyes, represent a key forgotten side of medicine.

In <u>the first part of this series</u>, I discussed the long lineage of scientists who have studied this semi-solid form of water, followed by listing some of the key properties of this gel-like 4th phase of water and what causes it to form. Since it has been studied by so many, it has many names (e.g., interfacial water or EZ water) and hereafter will be referred to as liquid crystalline water, which I believe is the most accurate description for it.

<u>In the second part of the series</u>, I discussed how water's ability to become a partial solid through its liquid crystalline phase explains many of the structural mysteries of the body. The body and its tissues have a significant strength and durability one would

expect to find in a solid, but at the same time, it has a high degree of flexibility and capacity for rapid movement one would expect in a liquid.

Note: the references for the assertions in this section can be found within those two articles.

Because liquid crystalline water is effectively both a solid and liquid, it can accommodate these conflicting demands. An incredible degree of natural engineering, in turn, exists within the body to utilize its properties to accomplish both. In addition to creating structure (including, for example, the barriers that protect your blood vessels from damage, which also happen to be a vital target of the spike protein's toxicity), the body also frequently makes use of phase transitions between water's liquid crystalline state and its regular liquid state.

The transitions are important because they provide the mechanisms that underlie a variety of physiologic processes our existing models fail to explain effectively. For example, as discussed in the article, there are a variety of significant inconsistencies within the current model to explain how muscles contract, but they have not been seriously critiqued because no better model exists for muscle function.

The phase transition model instead argues that muscles are designed to form liquid crystalline water. The formation of that water inside the muscle tissue naturally expands and stretches the muscle tissue. Then when the liquid crystalline water is transitioned back to its regular liquid state, the muscle rapidly contracts since an expansive pressure is no longer present to resist the tension in its stretched proteins. Another other interesting applications of this expansive force is that it allows plants and seedlings to break apart rock solid objects as they grow.

Similarly, the formation of liquid crystalline water (which holds a negative charge) with an immediately adjacent layer of positively charged protons creates an electrical charge gradient. Rather than dissipating, this gradient persists (essentially functioning as a battery), and this charge can be measured directly.

Thus, one of the most interesting characteristics of liquid crystalline water is that it effectively functions as an energy source living systems can utilize. Its ability to spontaneously move into a more structured form (which the muscles, for example, utilize) is one such example. Some of the other critically important utilizations of water's ability to convert ambient infrared energy into a usable form of energy include:

•Photosynthesis. To my knowledge, liquid crystalline water's contribution to this process has not yet been fully worked out. However, frequencies of light that increase liquid crystalline water have been reported to increase plant growth, and a particulate material that was designed to increase the formation of liquid crystalline water was shown to create at least a 2-3-fold increase in root length and/or formation of shoots.

•Nerve signal conduction (agents that block the formation of liquid crystalline water block nerve function, and nerve signal conduction depends upon a phase transition within the neuron).

•Cellular transport and division (these also appear to depend upon water's phase transitions).

•Fluid circulation.

Fluid Circulation

If the flow of a stream is obstructed, the water there will quickly transform from clear pristine water to a murky pool with numerous things growing in it and is no longer drinkable. Chinese Medicine, in turn, frequently uses this process as a metaphor for what occurs within the body when stagnation occurs within the body's own fluids.

Note: In addition to this stagnation causing pain and infections, this stagnation also is a common cause of inflammation.

Sadly, beyond the dangers of blood clots or strokes, few appreciate just how vital healthy fluid circulation is for the body or how many different types of fluids move through the body. Conversely, I believe many of the benefits attributed to a variety of therapies arise from their increasing fluid circulation within the body.

For example, exercise is well-known for improving anxiety and depression (to the point the benefits of exercise exceed the benefits of the highly dangerous medications we typically give for anxiety and depression). Similarly, the same benefit is often reported following vigorous intercourse. In both cases, various explanations have been proposed, such as "the activity produces endorphins," but it must also be acknowledged fluid movement of the body simultaneously occurs.

I personally believe in the stagnation hypothesis for a few key reasons:

1. Everything in our modern lives encourages fluid stagnation (e.g., sitting at a computer all day).

2. I typically observe those with the greatest degree of fluid stagnation carry the greatest psychological burdens (e.g., they are more depressed).

3. I frequently observe immediate improvement in individuals with these issues following them doing something which increases the fluid circulation within their bodies (e.g., infrared saunas).

My perspectives on fluid circulation are not unique, and a variety of healers employ various approaches to improve fluid circulation in the body (e.g., massage therapists trained in lymphatic drainage). Similarly, I have long theorized that some of the healthiest exercises that exist exert much of their benefit by increasing the body's fluid circulation.

For example, the patient I know who has aged the best (they are almost 90 but look and functions like they are in their 50s) has followed three very simple rules. Get lots of sunlight (which increases fluid circulation), frequently fast, and use a large trampoline (**not a rebounder**). The large trampoline is utilized since the transient zero gravity point the large trampoline creates at the top of a jump appears to effectively mobilize the fluid within the body, which I suspect is due to most of them being low pressure systems and hence much more sensitive to external influences.

Similarly, one of the most common traits I observe in the elderly who have maintained the functionality of their bodies decades after their peers is that they've made a point to take a walk daily. I believe the benefit of their regimen is that walking moves the fluids throughout the body and does so without straining or damaging the body (which you see with many other activities over time, like running on concrete or intensive weight lifting). Additionally, I have also seen similar effects in longtime practitioners of traditional Chinese exercises designed to support fluid movement within the body. Lastly, certain slow abdominal breathing exercises correlated with promoting longevity also improve the fluid circulation of the body, however this effect only holds true for a minority of the countless breathing exercises I have studied.

Unfortunately, while many healers try to work with fluid circulation through the method they are familiar with, their results are very inconsistent. As a result, there is an immense degree of variability observed in response to the innumerable treatments for fluid congestion (although the physicians I have found who excel in this area are widely renowned for the results they get and have long waitlists to be seen).

When I've looked at why there is such a deficit in ways to address fluid stagnation inside the body, I've concluded the primary issue is a widespread lack of knowledge in the anatomy and physiology of fluid circulation of the body. I believe this lack of knowledge ultimately arises from our scientific system prioritizing discovering molecular mechanisms targeted drug therapies can be developed and sold for you rather than systemic interventions that can be utilized on a broad, non-specific level (as those interventions go against the existing medical business model).

The Anatomy and Physiology of Fluid Circulation

One less appreciated aspect of evolution is that various functional constraints limit how big different organisms can get. For example, in many ways, insects are much more efficient organisms than animals, but with a few exceptions (e.g., a few insects within the Amazon jungle), they come nowhere close to the size of an animal and thus are almost always prey to animals.

One reason for this is that insects breathe through their exoskeletons, and as they get larger, the ratio between how much air can be exchanged over their entire surface area and the needs of the increasing volume of their body becomes incompatible with life (as something expands, the surface area to volume ratio rapidly decreases). Animals, in contrast, have lungs that, due to their innumerable foldings, contain the enormous surface area necessary to support life.

A similar problem also exists for cells and particularly groups of cells. They require a specific environment to surround them their internal contents can exchange with. Once a basic level of complexity is achieved, that environment can only exist if the host organism creates it. As a result, virtually all living organisms that pass that basic level of complexity separate their internal fluids into different compartments and have various systems in place to ensure the necessary circulation in and out of those compartments occurs.

At the smallest level, within many cells, regions of liquid crystalline water (where water thus cannot flow) predominate the cells, while channels of bulk state water can also be found throughout the cells. These channels both facilitate the movement of fluid throughout the cell. More importantly, it directs the flow, so each part of the cell can get what it needs rather than the cell depending on random diffusion to bring the right things where they are needed and dispose of those that are not (which is important because complex cells would likely be unable to function under the limited functional capacities random diffusion provides).

Each cell, in turn, is surrounded by interstitial fluid, which has to move to and from the cell. A variety of different conditions result when this circulation shuts down. One of the most common ones medical dissidents have identified throughout the ages is cancer, an observation which exists in parallel with the observation cancer cells lose the ability to metabolize oxygen. This has led many to theorize (there is also some evidence for this) that cancer cells represent a primitive survival mechanism where the cells revert to a form that focuses on the cancerous cell's own survival rather than working in harmony with the complex host it belongs to that provides an environment that can support the cells increasing evolutionary sophistication.

Note: There are a variety of different conditions that correlate with interstitial fluid stagnation most clinicians in practice have seen. One of the most interesting ones my colleagues have observed is that when the interstitial stagnation becomes extreme, individuals can lose their will to live, something also commonly observed in cancer patients.

Because many of these circulations occur within structures other than the classic vessels (arteries, veins, lymphatic vessels), anatomists have built their discipline around identifying, many critical circulatory pathways have only recently been discovered. For example, the Primo Vascular system, the essential but well-hidden system that best maps to the acupuncture channels, was only confirmed to exist in 2013.

In the case of the interstitial fluid, a circulatory network for it that exists throughout the entire body was only discovered a few years ago.

Note: Given its scope and function, the discovers have argued that this connected interstitial fluid network constituted a "new" organ, the interstitium. I found this designation quite interesting as one of the mysteries of Chinese Medicine has been what the "Triple Burner" (its twelfth organ) is. The Triple Burner was first described in the classic text of Chinese Medicine over two thousand years ago and has all the functions and acupuncture channel characteristics of an actual organ, but is stated to lack a discrete physical form. Many have speculated the Triple Burner is the fascia, something I was open to but not sold on. When I read the seminal paper on the interstitium, it was immediately apparent it matches all the characteristics of the elusive Triple Burner organ.

The fundamental reason the interstitium had never been found before was that the collagen structures that create the vessels for interstitial fluid to travel throughout the body collapse when taken out of the body and placed on slides. The millions of people who saw the interstitium's collagen fibers on slides over the centuries all then assumed the collagen fibers they saw were simply cellular debris of no purpose. This problem is identical to the one that has prevented the entire microbiology field from recognizing the clear signs of pleomorphic bacteria frequently seen under the microscope, as they too, are simply assumed to be irrelevant debris.

The discovers of the interstitium were able to bypass this issue because while using advanced instrumentation to monitor the flow of fluid in the body, they realized that a large ordered flow of interstitial fluid was occurring, that, in many cases, appeared to be happening within tiny previously unknown vessels. This thus made them look at those same slides to ask where these vessels could possibly be, and they eventually identified the collagen vessels.

Perceptual Walls

This point is critical to understand because it illustrates one of the most common pitfalls I see in science and medicine—most people cannot see something subtle or complex unless they have been primed to look for it. Beyond the numerous scientific discoveries that have fallen prey to this same trap, I have observed this is one of the primary reasons doctors gaslight patients—since they are not trained to recognize the signs of complex injuries, but only for the signs of a psychiatric illness, they typically will focus on trying to see psychological symptoms and believe that is what the illness is.

One of the major problems in medicine (especially as we've shifted more and more to an algorithmic model of medicine that enforces conformity to clinical guidelines and forces doctors to practice within the corporate model) is that the field does nothing to encourage creativity. As a result, when complex patients appear that don't make sense, doctors rarely think outside the box and ask, "What is going on here?" Instead, they utilize their closest matching protocol and then, once it fails, dump the patient on a specialist.

Many of the greatest innovators in history could see something right in front of them everyone else had missed and had the bravery to break from the herd to say it (for which they often suffered). Because of how frequently this has happened throughout history, I usually am fine with seriously considering and sharing an observation that puts me in conflict with my peers.

Similarly, in medicine, I realized early on that I would absolutely hate my life if I were doing the same algorithm over and over (regardless of how much I was paid to do it). I hence made a point to get hard cases sent to me where I had no idea what was going on so I could go through the struggle of creatively figuring out what to do. The end result of this is that I still love practicing medicine, whereas many older doctors I know who took the protocol route hate their jobs and are only continuing to work because they need the salary.

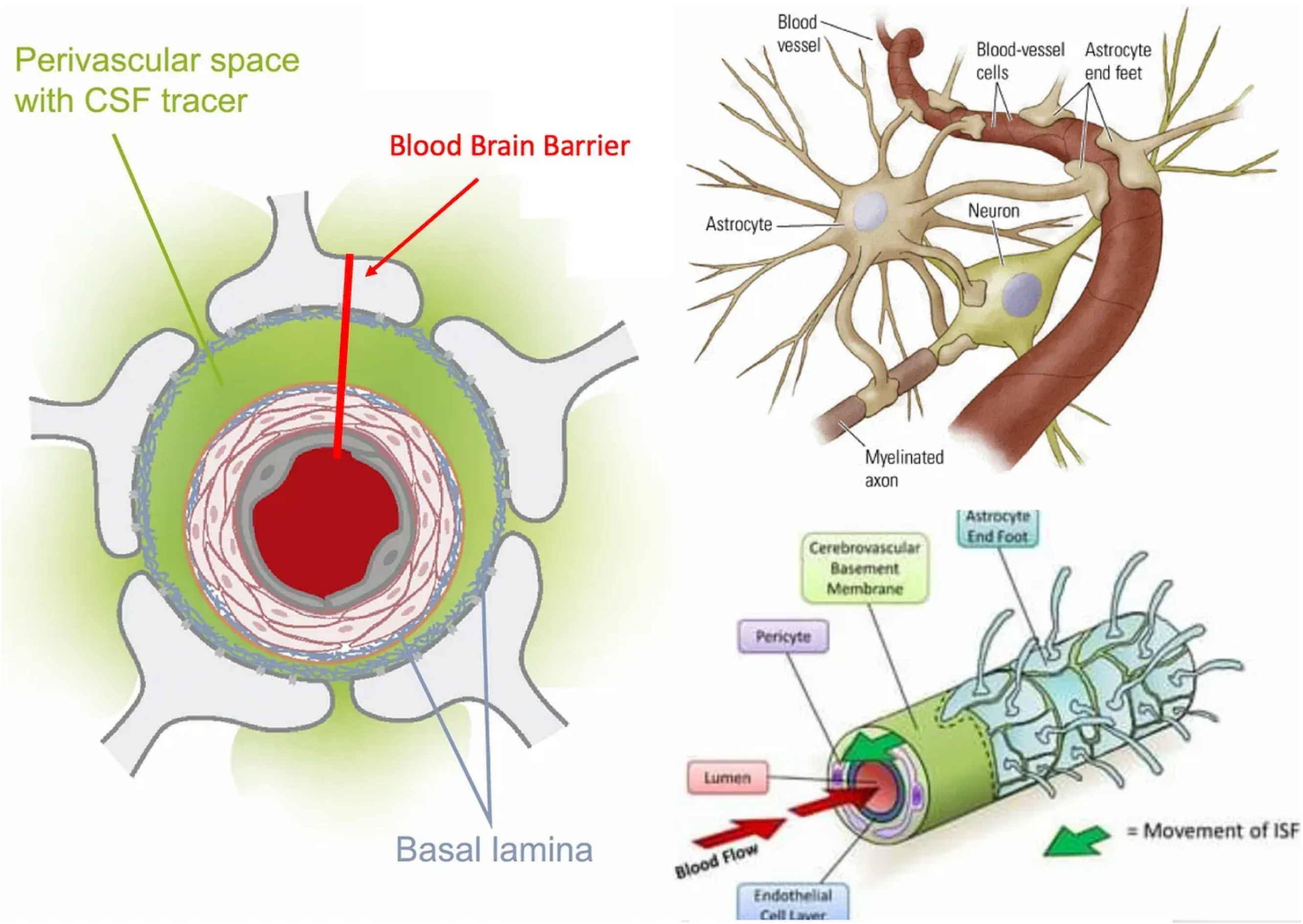
As a final point on this topic, many across the political spectrum have highlighted the serious issues emerging in our increasingly dysfunctional educational system. One of the most significant issues I've noticed over the last decade almost no one is discussing is the creativity our educational system used to incentivize is now practically gone. I believe much of America's success came from the unbridled ingenuity of this country, and its loss has been devastating to more fields than I can count. For example, it is reflected in the quality of students I see entering medical school and residencies now, as many of them really can't do anything except replicate what they are told to do.

Lymphatic Circulation

Interstitial fluid essentially contains two things—nutrients from the bloodstream and waste material from cells (or invading organisms). The lymphatic system is the drainage system that removes those waste materials from the interstitial fluid. When it fails to effectively circulate what it is responsible for removing, various health issues emerge (including many which can lead to fatal hospitalizations).

Much of our knowledge of the lymphatic system comes from anatomists having dissected the entire body and identified where every lymphatic vessel is. This led to the longstanding assumption that no lymphatic drainage existed from the brain (which, if you think about the functions of the lymphatic system, does not make sense), as no vessels could be found.

Eventually, ten years ago, like what happened with the interstitium, an advanced method was used to trace fluid movement throughout the body. Once this was done, it was observed that lymphatic drainage was occurring within the brain and dramatically increased during certain sleep phases. Those researchers eventually figured out that the astrocytes were responsible. Astrocytes are support cells present throughout the brain that form the final layer of the blood-brain barrier by fully covering each blood vessel with their “feet,” thereby requiring anything that enters the brain from the blood vessel to first pass through their feet.



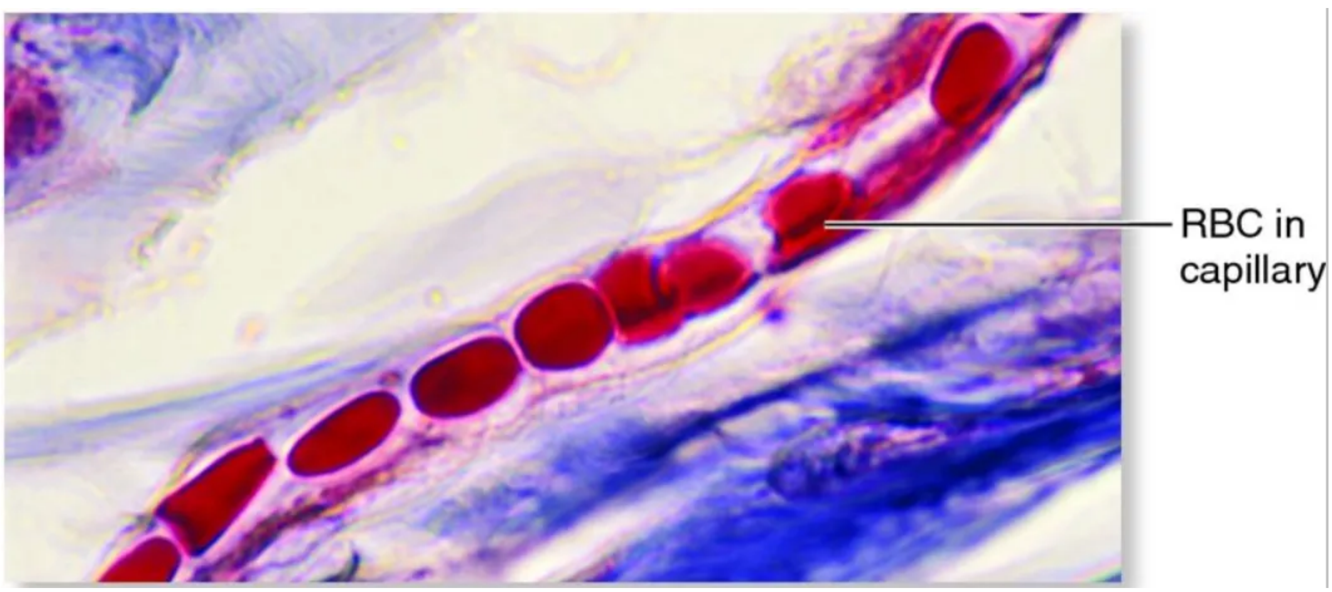
When individuals slept, the astrocytes, in unison (while maintaining the connection between the feet), would slightly pull back their feet, creating a space between their feet and the blood vessels. This perivascular space functions as the key conduit for the glymphatics. The pulse of the blood vessel lying underneath this space is then theorized to serve as the pumping mechanism for this movement through these “vessels.”

The glymphatic system is incredibly important, and more and more, as time moves forward, its dysfunction has been linked to a variety of chronic degenerative neurological conditions. It has also been identified as a key reason for why a second traumatic brain injury is often so devastating, as the first one disrupts the delicate architecture of the glymphatic system, so when the second one occurs, the capacity to drain the edema and cellular debris that result from it is radically diminished. Many colleagues also believe the glymphatics explain a few consistent observations they make in patients with chronic debilitating illnesses (e.g., chronic fatigue syndrome). Impaired sleep is frequently seen in these patients, impaired sleep appears to have significant adverse effects on their condition, and significant benefits are often observed if the patient's sleep can be improved.

Note: the importance of the glymphatic system is further discussed in this article on the causes of Alzheimer's disease.

Mysteries of Microcirculation

A consistent pattern emerges when each circulatory pathway is looked at in the body. Tiny spaces with no extrinsic force driving their flow (or only a very small one) simultaneously require a regular fluid movement occurring through them, and without that flow, life cannot function.



Note: this also applies to capillaries which continually have single lines of blood vessels squeezing through tubes the same size as them.

The immediate thought I had when I reviewed the anatomy of each was, "no wonder impairing physiologic zeta potential can be so devastating here. I have no idea how this system could move if any of the fluid in it were to be clumped together."

Note: colleagues and I frequently observe a variety of chronic degenerative diseases and subtle impairments (that often go mostly unnoticed) that arise from impaired microcirculation of the body, which I now believe reflect the widespread disruptions to the physiologic zeta potential modern society creates.

Others have also wondered what makes circulation within the body possible. Much of this came from Rudolph Steiner, an Austrian mystic who made a variety of observations about the natural world that inspired generations to follow his work. One of the points he made to his students was the urgency of recognizing that the heart was not a pump.

Because of this, countless doctors who follow his work have looked for evidence challenging the notion the heart is a hydraulic pump that moves the entire circulatory system. They, in turn, have identified a variety of observations that suggest pressure generated by the heart is not the driving force of circulation; instead, something independent of the heart's pumping action causes blood to move in the body.

For example, spontaneous circulation can be observed in a developing embryo before the development of its heart, and the flow and pressures observed in the body are frequently inconsistent with the pressure the heart generates being the driving force behind blood circulation. Many of these observations are detailed in this long-forgotten paper.

When I've thought this question over at length, it does not seem in any way realistic that the heart could provide enough force to move the red blood cells through every capillary in the body. However, if that is the case, like the above examples, the question again becomes, "what is causing the fluids inside the body to move?"

Proton Induced Motion

Pollack and his team happened upon a chance discovery in their laboratory (discussed in great detail within this paper), which at last provided an answer to the mysteries of circulation.

> Fluid commonly flows in response to an external pressure gradient. However, when a tunnel-containing hydrogel [which contains liquid crystalline water] is immersed in water, spontaneous flow occurs through the tunnel without any pressure gradient. We confirmed this flow in a wide range of plant- and animal-derived hydrogels. The flow appears to be driven by axial concentration gradients originating from surface activities of the tunnel wall. Those activities include (i) hydrogel-water interaction and (ii) material exchange across the tunnel boundary.

As stated above, liquid crystalline water (which Pollack terms EZ water) requires ambient infrared energy and a polar surface to form on. A curious phenomenon then occurs when that surface lines the inside of a tube (which, as far as I know, is the case for every fluid vessel in the body)—the liquid crystalline water lining the tube causes water to flow spontaneously through it.

> EZs [regions of liquid crystalline water] were studied previously by immersing sections of tubes made of a strongly hydrophilic material, Nafion, in aqueous microsphere suspensions. A microsphere-free EZ developed adjacent to the tube surface. In the central core of the tube, the movement of the microspheres demonstrated a flow, continuously sustaining itself at a velocity of ~10 μm/s in the axial direction [from the start to end of the tube]. Similarly, EZ and flow were also observed in tunnels lodged within various hydrogels. The gel materials included polyethylene glycol, poly(vinyl alcohol), and poly(acrylic acid). **On the other hand, flow was not observed in tubes built of hydrophobic materials** such as Teflon [and others], **which do not generate EZs.** The presence of EZ appeared to be a necessary condition.

Since liquid crystalline water's formation requires ambient radiant energy to form (e.g., the infrared energy present in light), its presence was found to influence the flow that was observed.

> We found that increased infrared energy substantially increased the flow velocity (Fig. 3B).

> Since incident radiant energy (light) fuels EZ expansion, that energy may likewise fuel the self-driven flow. We confirmed that application of ultraviolet-containing white light could boost flow velocity by up to 500%. Thus, the self-driven flow mechanism can convert radiant energy into kinetic energy.

Pollack theorized this flow was generated by the mutual repulsion created between the positively charged protons (hydrogen atoms) that are expelled as water (H_2O) transitions to liquid crystalline (H_3O_2) water. That formation process is further explained in [part one]() of this series. A few additional observations support this hypothesis. The first is that protons are continually added to the water that passes through:

> We found that the exiting water had a lower pH value than the entering water; the pH difference exceeded one unit and never diminished — even after 30 minutes of continuous flow. While we still couldn't resolve the quantitative issue, we did establish that the passing water continued to receive protons from the annular EZ without diminution, even over extended periods of time.

Note: In subsequent experimental designs, Pollack has demonstrated this flow can persist for hours to days.

The second was that flow was greatest in narrow tubes:

> Another prediction of the proton-gradient hypothesis is that the flow should be faster in narrower tunnels. Assuming the proton-release rate per unit area of the annular EZ is spatially invariant, then, since reduced tunnel diameter means increased surface-to-volume ratio, a narrower tunnel should lead to a higher proton concentration in the core (see [Fig. 3A]()). This results in a higher proton gradient (assuming the bath's proton concentration remains unchanged), which, in turn, should lead to faster flow in the narrower tunnels.

The third was that the direction flow was always from the narrower end of a tube to the wider end:

> A common feature shared among the various flows was the direction—always toward the region with larger cross section or volume.

> Thus, when a narrower tunnel lies in series with a wider tunnel, the proton gradient should point from the narrower to the wider section, as consistently observed.

Likewise, in each case where it can be observed, each fluid conduit is lined with a material recognized to create liquid crystalline water. For example, all blood vessels, including the smallest capillaries, are lined with a protective glycocalyx. As discussed in the second part of this series, the glycocalyx is remarkably well suited for creating liquid crystalline water on its surface, and Pollack and others have repeatedly observed its presence there.

The biological flow of fluids that is independent of a central pump has also been explored in animals:

> On the other hand, blood can apparently flow without a beating heart. After the heart had been arrested, postmortem blood flow was confirmed in mice, rats, dogs, and chick 30 embryos (4-7). The flow persisted from 15 minutes to several hours. Furthermore, some 31 amphibian larvae could live up to 15 days, and even differentiate following surgical 32 removal of the heart (8-10), implying an alternative means for propelling blood.
>
> Here, in an avian circulatory model, we confirm several predictions arising from this flow mechanism. First, flow continues after cardiac ejection has been stopped; this implies some driving mechanism beyond ventricular ejection. Second, IR energy fuels this flow, both in the post-mortem situation and also in the normal physiological state. All of this demonstrates the existence of a second driver of blood flow, beyond the heart: the vessels, themselves.

Other organisms also utilize this mechanism. Plants require significant internal transportation of water (e.g., consider how high trees must pull water from deep underground to sustain themselves) but do not have any pumping organ which could facilitate this activity.

> To explore the generality of the self-driven flow, we tested diverse hydrogels. They comprised **plant-derived hydrogels** including agarose, agar, and starch, as well as animal-derived hydrogels including collagen and gelatin. These hydrogels, ranging

> from polysaccharides to proteins, were chosen on the basis of their broad appearance in nature and wide application in science and technology.

In the lab, Pollack demonstrated that the xylem (the vessel plants use to transport water) creates liquid crystalline water. Pollack has also shown that the flow created by liquid crystalline water allows it to overcome the resistance of gravity and climb up tubes (a commonly observed phenomenon known as capillary action).

Additionally, Pollack has also demonstrated that the random spontaneous movement observed in water (known as Brownian motion) is influenced by light. This suggests it is likely due to the motion created by liquid crystalline water. Unlike the tube examples discussed in this section, where something exists to direct the flow created by the charge repulsion between hydrogen atoms, in most cases, that structure is not present, and random motion instead occurs when tiny particles in water create exclusion zones around themselves.

Direction of Circulatory Flow

Pollack's model shows that the liquid crystalline water goes from the area of highest to lowest proton gradients, which, in most cases, means going from a narrower to a wider conduit. This is important for another reason—it mirrors the direction of fluid flow in the body in areas with minimal to non-existent pumping mechanisms. This again suggests the utilization of liquid crystalline water is fundamental to the body's design.

For example, when blood exits the smallest blood arteries and enters the capillaries (where much of it leaves the circulation to nourish the tissues), it must then flow into the smallest veins, which merge into a much larger and more powerful flow as the veins join together into larger and larger veins. At the capillaries, no pressure exists to serve as a pump, yet the power behind the circulation never stops, so something else must be at work.

Since the smallest veins are three times the size of the smallest arteries (and continue expanding), a natural direction of flow from the smallest arteries to veins is created. Similarly, the lymphatic system (which has a variety of weaker pumps recognized to fail in various complex illnesses) also starts off as tiny lymphatic vessels that eventually collect in much larger lymphatic vessels.

At the same time, however, since most of the arterial flow goes from larger to smaller vessels, the picture is a bit more complex and required Pollack to test it directly.

> As the model predicted, the flow in the large, near-heart arteries was indeed opposite to the natural direction just after the heart stopped beating. Hence, model predictions appear to match experimental observations for all vessel beds [this implies the hearts contractions does plays a key role in the direction of arterial blood flow].
>
> If the flow in arteries is against the flow in the capillaries and the veins, a natural question is: who plays the dominating role? The answer should be the capillaries and the veins: compared to the arterioles, the venules [smallest veins] are higher in number; thus, more venules can generate flow. This conclusion is verified by the dynamics of the postmortem arterial blood flow. Postmortem flow in larger arteries was originally in the reversed direction, not the natural direction. Yet, the flow gradually resumed its natural direction from the peripheral region of the arterial network, indicating that the blood flowed into the capillaries and the veins. As the non-beating heart stopped replenishing blood to the arteries, ultimately, the arteries emptied. The emptied arteries indicate that the flow driving capacity of capillaries and veins exceeds that of the arteries. Thus, all blood vessels drive the blood towards the natural direction.

Note: factors that affect the concentration of what is dissolved in water (e.g., evaporation or substances leaving the blood, such as what happens at the capillary bed) can also affect the liquid crystalline water-induced flow, in some cases reversing its direction. Since this subject is complex, it will not be covered in this article.

The Spike Protein and Zeta Potential

In late 2019, I realized COVID-19 would turn into a huge problem. Because of this, I contacted my colleagues who, unlike me, were practicing in areas I expected to be hard hit by it (e.g., New York City) and told them they needed to prepare for what was coming and stockpile personal protective equipment.

Most of them did not listen to me, but because of the earlier dialog, once COVID-19 started within the United States, they were willing to share their clinical observations with me. One of the things I heard repeatedly was reports suggesting abnormal stagnation was occurring in the fluids of their patients (blood clots being one, but by no means the only example).

I hold the beliefs that one of the most common things that is observed in hospitalized patients is an impaired physiologic zeta potential, that individuals who had pre-existing impairment of their zeta potential are more likely to be hospitalized, and that the routine treatment we reflexively give most hospitalized patients, intravenous fluids actually "works" because it ***partially*** restores the physiologic zeta potential.

Note: One of the best recent pieces of evidence I heard for this theory was [Pierre Kory's] observation that occasionally, bedside ultrasound in the critical care unit would show the blood in the largest veins of the body will is clumping together and that this sign typically immediately precedes death. This observation mirrors what investigators over 50 years ago found in monkeys infected with malaria—that as the infection progressed, blood clumping would occur in larger and larger blood vessels. Once it occurred in the largest vessels, death would immediately follow (unless something was provided to prevent the clumping). This progression of blood clumping together first in the smallest and then eventually the largest vessels as disease severity increases also mirrors some of the classic diagnostic models within Chinese Medicine.

Many of the observations my colleagues on the early front lines of COVID-19 shared with me mirrored what I had previously associated with extreme disruptions of zeta potential, something which had not been observed with the original SARS virus (SARS-CoV-1). This then raised the question, why does SARS-CoV-2 do that?

After looking at it for a while, I concluded it had to be the high positive charge density unique to the SARS-CoV-2 spike protein. This became the original reason for my concern with the vaccine. Since then, many signs have emerged that the spike protein directly affects zeta potential. These include:

•Modeling showing the SARS-CoV-2 spike protein adversely affects physiologic zeta potential.

•Some of the unusual characteristics of COVID-19 (e.g., the low blood oxygenation arising in the peripheral but not central vessels) being due to its zeta potential induced microclotting. One recent study supporting this link showed athletes who received the vaccine experienced a decline in their oxygen uptake.

•Some of the therapeutic benefits (e.g., from ivermectin or ozone) seen in hospitalized patients, such as improved oxygen uptake occurring immediately following treatment, something that is most likely only possible to attribute to a rapid dispersion of blood clotting.

•Ivermectin being directly demonstrated to disperse spike protein-induced blood clumping (microclotting).

•Vaccine injured patients and "normal" vaccinated patients developing subtle cranial nerve palsy's indicative of microstrokes having occurred (I am surprised at how common this is, particularly with the abducens nerve, and once I point it out to my colleagues they can normally identify them). Many of the other symptoms commonly associated with COVID-19 vaccine injuries are also things I had previously learned to associate with poor zeta potential.

•Everyone performing live blood cell analysis observing blood clumping occurring in vaccinated blood (e.g., see this study).

• Vaccine-injured patients improving from a variety of treatments directed at restoring physiologic zeta potential.

Conclusion

As I have looked at this subject, the questions I keep returning to was, "what is the relationship between zeta potential and liquid crystalline water?" and, "is the spike protein's effects on the liquid crystalline water of the body part of its toxicity?" These were the most challenging question to answer when I wrote this series and what much of my research was directed towards.

To provide an overview of what I've found, some of the benefits and effects attributed to improving physiologic zeta potential may actually be due to increasing the formation of liquid crystalline water (and vice versa). Similarly, many factors that improve one of these also improve the other (as do factors that worsen them).

In the final part of this series, my goal is to explain my understanding of the relationship between the two of these and to list the factors which have been shown to affect each (e.g., what increases liquid crystalline water in the body).

I thank you for following this series and your kind support that has made this Substack possible. Lastly, I apologize in the delay in getting to this part of it, as due to the turbulent times we live in, so many other things came up I felt urgently needed to be written about first.