Vital Structured Water, Aquaporin's and Intracellular Hydration Sustain Wellness

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Summary

This paper highlights the difference between structured and non-vital structured water, and the way they both cross the cellular membrane in animals, the cell walls in plants and bacteria through a complex set of water channels that result from the quaternary structure of proteins known as aquaporin's.

Hence, not all water is the same, a single molecule of water does not exists as such and thus the molecules of water interact among themselves forming crooked semi linear structures known as non- vital structured water. The interaction of water molecules also forms clusters made of 37 molecules of water known as vital structured water, energized water, living water or crystal water. Cell hydration is one of the most important roles of water in nature to keep the biological systems healthy and allow for the human body to sustain a state of wellness and wellbeing.

Overview

Drinking 3 to 4 liters of ordinary, non-structured tap and bottled water or not drinking enough water might be harmful to the human body. Most of the water that is consumed does not hydrate the cells enough due to the hydrophobicity of the cell membrane and thus, most of it remains in the intercellular space causing oxidation, and turning the pH of the interstitial environment acid. When we become thirsty we are already dehydrated. So even by drinking 3 to 4 liters of non- vital structured water per day our body may still be dehydrated, as water is not getting inside the cells, hence it accumulates outside of them. This may have serious consequences to our health and state of wellness, such as speeding up the aging process due to oxidation, forming kidney and gall bladder stones as a consequence of high acidity, developing cardiovascular disease, kidney disease, osteoporosis, Parkinson's disease, neurological disorders and a wide range of other chronic conditions, all due lack of cellular hydration.

To avoid such health issues and maintain a state of wellbeing, there is a solution. It is the quality of water that matters to sustain health and a state of wellness. The quality heavily relies on the geometrical shape and thus the stereochemistry of the molecule of water

which determines the amount of water that is able to enter the cell through a family of tetrameric membrane proteins: the aquaporin's.

This article describes the way water molecules penetrate through the thickness of cell walls in plants which are made of cellulose and pectin, and through cellular membranes in animals that are made of fats known as phospholipids. As it is known, water and oils or fats do not mix, so, nature's answer to this, is the presence, structure and function of aquaporin's that allow for molecules of water to cross both the cell wall and the cellular membrane from the intercellular matrix to the cytoplasm and vice versa.

Introduction:

Aquaporin's are a family of tetrameric membrane intrinsic proteins (MIP, see figures 1 and 2) that form water channels so that water can move in and out of the cells, thus they regulate the water content of every cell within the monera, protista, plant and animal kingdoms in nature[1,2.]

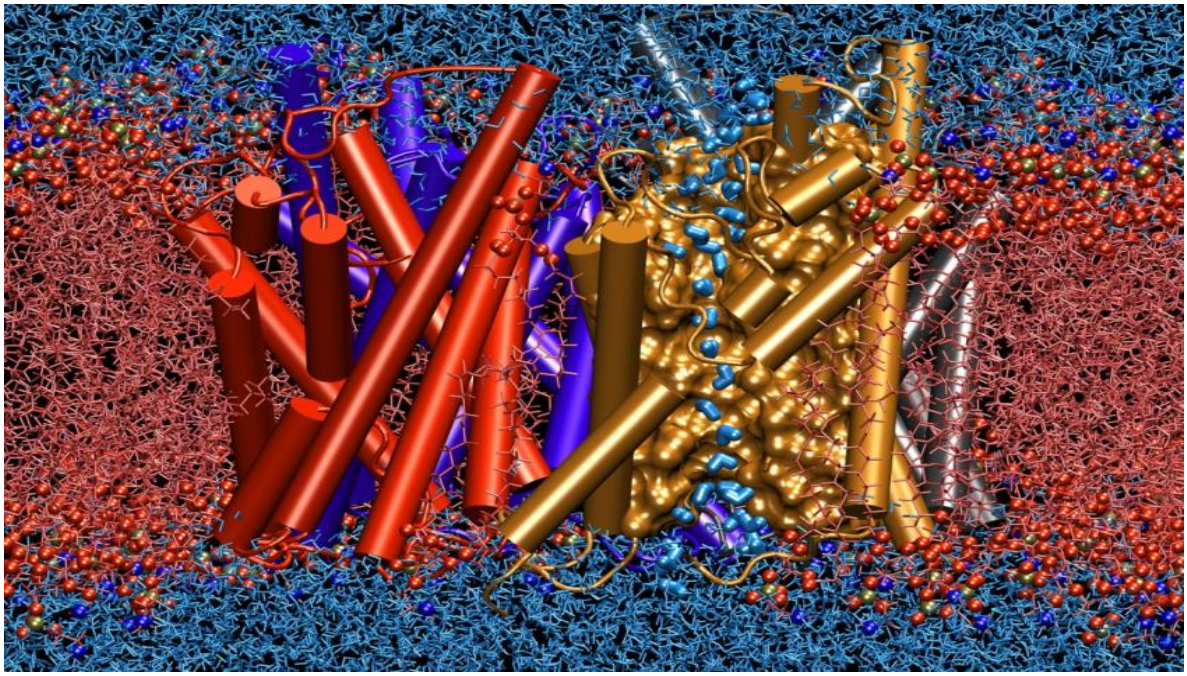


Figure 1. Tetrameric membrane proteins known as Aquaporins[1] cross the cell membrane allowing for water to travel through the channels formed due to the stereochemistry of this complex macromolecules, and yet they do not allow smaller particles such as protons for getting through. On close observation of the diagram above, one can see the twist of the water molecules, shown in blue over gold in the matrix of this complex network of proteins.

The water pores are completely impermeable to charged subatomic particles such as protons [3,] which exhibit a positive electrical charge, a truly remarkable property that is basically responsible for the membrane electrochemical potential[4]. This is paradoxical at the same time, since protons usually can be transferred through water molecules[3,4]. Water molecules passing through the pores or channels are forced to flip at the centre of the channel and thus break the donor/acceptor arrangement that is necessary for proton translocation [4,5]. The protons bind to atoms such as chlorine and molecules such as lactate to form hydrochloric acid in bacteria and plant cells, and lactic acid in animal cells respectively.

The molecule of water theoretically speaking is made of three atoms, two atoms of Hydrogen and one atom of Oxygen. The cell membrane is made of a bilayer of fats known as phospholipids and glycoproteins, while the cell wall of plants and bacteria is made of pectin, cross linking glycan's and hemicelluloses, a polysaccharide or sugar [5, 6].

As it is known, water and oils or fats never mix due to their respective polarities. So, how is water able to cross the cellular membrane and get through the thickness of cell walls?

The answer to this question is found in complex tetrameric macromolecules known as membrane intrinsic proteins (MIP), the aquaporins[1] as shown in figures 1 and 2. Non-vital structured water forms a crooked structure due to their geometry. The angle between the two hydrogen atoms is 104.5^{o}. Vital structured water forms a cluster made of 37 molecules of water that is able to penetrate through the aquaporin system much easier than crooked water does, thus allowing for significantly improved hydration[3].

Structurally speaking it is much easier for a cluster of 37 molecules of water to pass through the aquaporin's than it is for crooked non-vital structured water to do so. Nature always works with efficiency, that is, less energy or effort followed by a maximum benefit or return. Clustered water and vital structured water is able to move freely through the aquaporin channels, while the crooked non-vital structured water needs a gradient of energy to move across the membrane, thus not all the water that becomes available to the cell penetrates it, and thus nature has designed over 10 types of tetrameric MIP to allow as much water to pass through the cell membrane and the cell wall [3,4], as shown in figure 3.

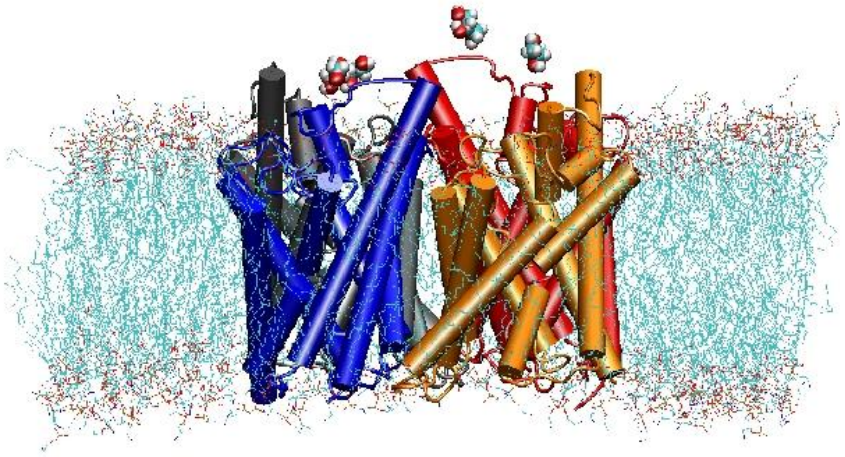


Figure 2. Cell wall of E. coli, a gram negative bacterium, showing an aquaglyceroporin, a channel that is also permeable to saccharides or sugars like triose, tetroses, pentoses and hexoses as well as to small lipid molecules such as glycerol which is the building block of triglycerides.

Since, not all the water passes through, it creates an oxidative soup where it becomes dissociated and in doing so it becomes much more acidic. When this happens, the collagen fibers as well as other proteins such as elastin start to denature, and thus the cells lose their turgency and the cells dehydrate. The proton then combines with lactate in order to form lactic acid. Thus the body turns acidic. When this happens the muscles and the bones start to leach minerals such as Magnesium, Zinc and Calcium in order to form salts that are able to neutralize the lactic acid formed by the interaction of lactate and the protons that result from the dissociation of water.

Moreover, in plant cells, the resulting protons bind to chlorine forming Hydrochloric acid (HCl) and thus chlorosis becomes evident as the plant leaves or the grass becomes yellow and eventually dries up.

Water is a conductor, it is an electrochemical sensor that has the ability to increase and decrease frequencies[7,8]. The higher the frequency the more complex structures it forms [9]. When the water is energized by spinning the beauty wand, passing it through the home water energizer, and simply blowing air through the HWE and the pendant, water raises its frequency by resonance and thus it becomes structured as shown in figure 3.

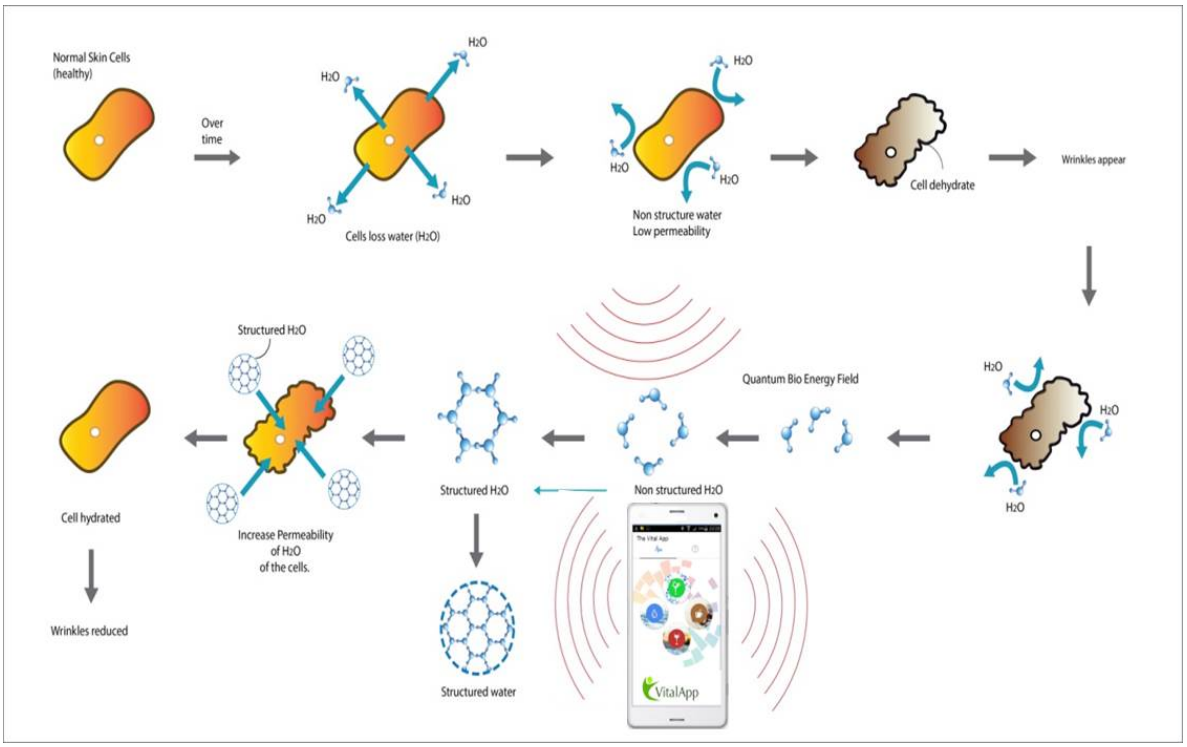


Figure 3. Cell hydration and vital structured water are essential for cellular function. Since not enough non-vital structured water penetrates the cell, it accumulates in the intercellular matrix causing acidity and oxidation which translate into an aging process characterized by the formation of wrinkles. Using the HWE, the beauty pendant, the molecular water enhancer and the Que disc, the water molecules cluster forming structured energized water which readily penetrates the cell membrane, allowing for improved hydration and thus the hydrated collagen fibers and the elastin found in the deep layers of the skin allow for the reduction of wrinkles.

The atom of Hydrogen is made of one nucleus that contains subatomic electrically charged particles known as nucleons. Among them there is the proton which is a subatomic particle found in the nucleus of the atom that exhibits a positive electrical charge. Another nucleon is the neutron, which is there to mediate the electrical interaction between the proton and the electron that is found in the first atomic shell far away from the nucleus.

The electronegativity of the atom of Oxygen is much stronger than that of the atoms of Hydrogen that make up a molecule of water. Electronegativity is the ability that an atom has of pulling away electrons from a neighboring atom, in this case Hydrogen, see figure 4. This renders the atomic charge of the Hydrogen atom as partially positive since it is partially giving its electron away to the atom of Oxygen which in turn gains a negative charge as shown in figure 4. This makes the water molecule a dipole, and thus water has been labeled as the universal solvent, since it can dissolve many solutes such as

carbonates and silicates. Non-vital structured water is able to cause sedimentation of these solutes; whereas, energized or vital structured water is able to dissolve them.

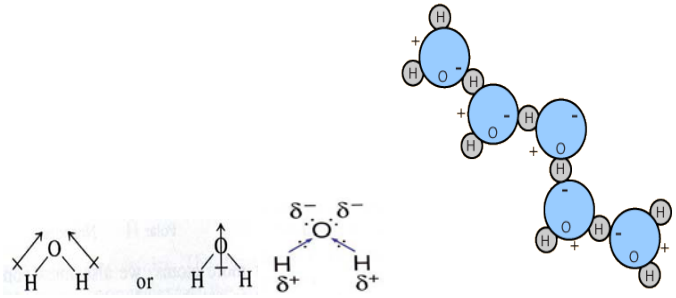
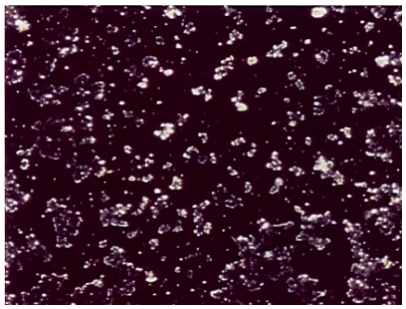


Figure 4. The electronegativity of the atom of Oxygen pulls the electrons of the atoms of Hydrogen towards itself rendering the molecule of water partially positive and partially negative. The dipole formed allows water to become a molecule that is known as the universal solvent and gives water a dipole momentum allowing water to conduct electricity.

(c)



(a)

(b)

Figure 5. Clustered water resulting from the Vital App. The hydrogen bonds formed among molecules of non-vital structured water (a) allow for the formation of a hexagonal shape resulting in Vital structured water (b) through the Vital App (c). An initial angle of 104.5° found in a single molecule of water and non-vital structured water changes to a 109.5°angle forming a pyramidal shape and subsequently to a 120° angle forming a hexagonal shape. The hexagonal shape is also known as Bio-water or Vital structured water and its structure is lasting.

The angle between the atoms of Hydrogen is 104.5^0 in the molecule of water. When the water becomes energized through the action of spinning energy this angle slightly increases by 5^0 to form a 109.5^0angle. This increase changes the structure of crooked water into small clusters of water made of 37 molecules of water each, making it 'wetter' and thus increasing its capability for hydration, as most of it will pass through the aquaporin's as shown in figure 5.

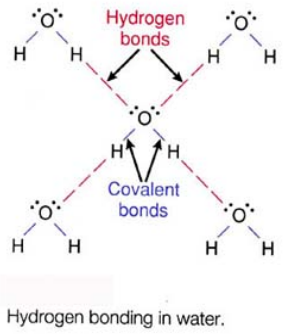


Figure 6. Angled Structure of Water showing the hydrogen bonds and the covalent bonds that link the molecules of water. One molecule of water is never alone. Molecules are always associated through Hydrogen bonds to other molecules of water. When dissociation occurs, the Hydronium ion forms and thus the water molecule exhibits a positive electrical charge and it then behaves as an acid (refer to figure 7).

Since there are 6.023×10^{23} molecules of water in one mol of water, the water molecule does not exist by itself, as it interacts with the many others through the formation of Hydrogen bonds [7,8,9] that make water a rigid structure as shown in figure 6, so that it can become ice as shown in figure 7.

The angle of 104.5^0 allows for the water to form large conglomerates of almost semi tetrahedral structures, making it difficult for them to cross the membrane even if aquaporin's are present.

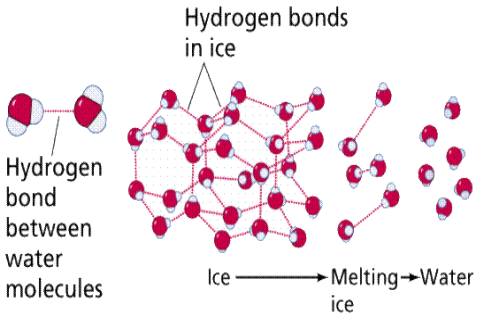


Figure 7. Hydrogen bonds result from the interaction between the Hydrogen atom of one molecule of water, with the Oxygen atom of another molecule of water. This is a weak bond that becomes stronger as liquid water becomes ice. The association and dissociation of the molecule of water is minimal when water becomes solid as ice.

As the molecules of water associate and dissociate among themselves, a hydronium ion[11] is formed which makes the true structure of water as H_3O^+as shown in figure 8.

$$2\ H_2O \rightleftharpoons OH^- + H_3O^+$$

Figure 8. The formation of the hydronium ion is shown as a result of the hydrogen bond that forms among the physicochemical interaction of two molecules of water. Such an ion behaves an acid since it exhibits a positive charge as a result of sharing a proton from an adjacent molecule of water.

Once the water molecules become energized, the clusters formed arrange themselves into hexagonal and pentagonal structures are shown in figure 9.

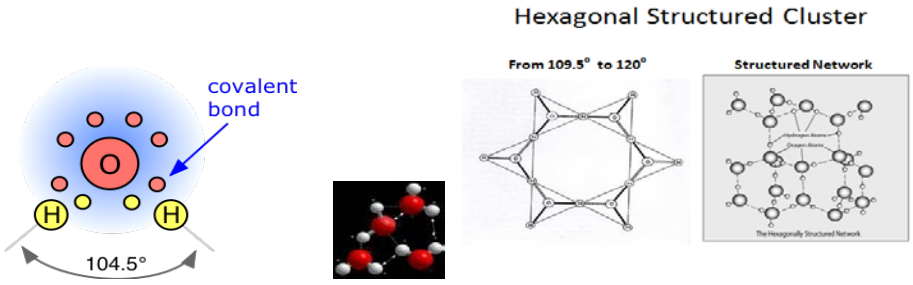


Figure 9. The angle of the molecule of water is 104.5^o and as it clusters to form hexagonal structures, this angle changes to 120^o. Once this angle is formed, the molecules of water start to aggregate forming a water matrix made of pentagons and hexagons.

Conclusion:

By raising the frequency of the molecules of water, using the Vital App, the angles of these molecules change from 109.5^{o} to 120^{o}. This allows for the hexagons and pentagons to form as shown in figure 8, giving rise to a structure known as vital structured water. The resulting clusters are able to increase dramatically the permeability of the cell membrane, so that the cells become easily hydrated and, as they pass much easier and efficiently through the aquaporin's system than non-vital structured water. Therefore, it is possible to drink less water as long as it is structured, keeping the cells of our body healthier and hydrated. In this way, the formation of salts and the state of oxidation are kept to a minimum, the surface tension decreases, water becomes 'wetter' and thus bio available in order to sustain cellular hydration that translates into wellness and wellbeing in biological systems, including the human body. So, drinking vital structured water keeps us looking younger and healthier longer.

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