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Research Article

It is the Positive Electrization of Areas affected by Cancer and Ischemia that Determines their Ability to Accumulate Nanoparticles used for the Diagnosis and Treatment of Both of These Pathologies

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Abstract:

The obtained visual data show that filamentary structures can form in aqueous-salt solutions under the influence of light. These data allow assuming that a similar formative effect underlies the restorative effect of light on the filamentous structures of the human body, that is, neurons, bones and vessels, both blood and lymphatic.

Keywords: light therapy; phototherapy; laser therapy

Introduction

There is no doubt that light promotes the restoration of damaged nervous tissue, bones and blood vessels, both blood and lymphatic [1–10], i.e. structures containing extended thread-like fragments. At the same time, the nature of the phenomena underlying these restorative effects of light remains virtually unclear. For this reason, the detection of needles and threads in aqueous salt solutions illuminated by directed light seems to be of great importance and therefore worthy of discussion.

Results and Discussion

First of all, it should be noted that the shapes of crystals formed in aqueous solutions of salts are very sensitive to the electrical charge (potential) of the water used to prepare these solutions (Figure 1).

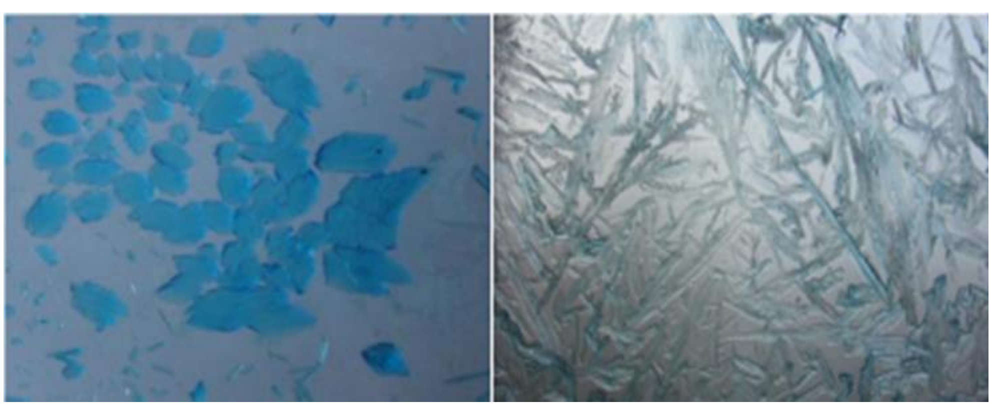

Figure 1: Left: Intensely blue (because more hydrated [14]) prismatic crystals formed in $CuSO_4$ solution prepared using positively charged water. Right: Pale blue or colourless (because less hydrated or completely dehydrated [14]) plant crystals formed in $CuSO_4$ solution prepared using negatively charged water.

It is probably worth adding here that this sensitivity (Figure 1) may be of interest to physicians; in particular, it is very likely that it is this sensitivity that underlies such a diagnostic test as the arborization test (also called the ferning test) [11-13].

It should also be noted that the shape of crystals formed in aqueous solutions of salts is influenced by both the electric currents passed through these salt solutions and the pulsed electromagnetic fields acting on them (Figures 2, 3).

Figure 2: These are crystals formed after drying an aqueous solution of $CuCl_2$ through which a direct current of 10 mA was passed for 10 minutes [15]; compare with Figure 1, right.

Figure 3: These are crystals formed after drying an aqueous solution of $CuCl_2$, which was previously subjected to the action of EMF, pulsing with a frequency of 10 Hz for 10 minutes; for contrast, the crystals formed were treated with ammonia vapours [15]; compare with Figure 1, right.

Thus, it was these results (Figures 1 – 3) that allowed expecting that light, which is essentially an electromagnetic wave [16], also influences aqueous solutions of salts and promotes the formation of crystals reflecting this influence. In particular, given that light pushes positive charges in the direction of its propagation and negative charges in the opposite direction [16], it was expected that crystals formed in aqueous solutions of salts would form corresponding dipoles oriented along the propagation of light rays. Moreover, given the ability of dipoles to interact with each other in a specific way [17], it can be expected that light can promote the formation of threads or needles formed by interacting dipoles and oriented along the light rays.

It should be noted that these expectations were fully justified, at least with respect to aqueous solutions of a number of salts. At the same time, it was established that the ability of different salts to form structures that reflect the direction of light illuminating their aqueous solutions is not the same. In particular, it was established that such ability is inherent to the greatest extent in potassium and sodium phosphates. Thus, it was established that sodium phosphate forms threads, and potassium dihydrogen phosphate - needles, which are mainly collinear to the direction of incident light (Figures 4, 5).

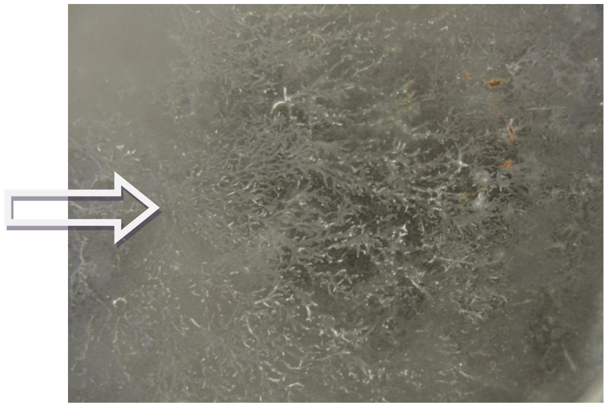

Figure 4: These are the threads formed after drying an aqueous solution of Na_3PO_4 illuminated by diffuse daylight directed from left to right (as the transparent arrow shows).

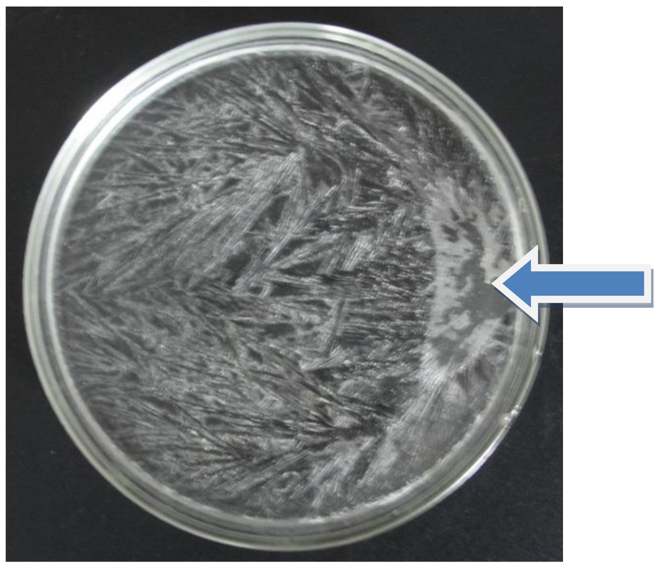

Figure 5: These are the needles formed after drying an aqueous solution of KH_2PO_4 illuminated by a blue LED beam directed from right to left (as the blue arrow shows).

In essence, it has been established that phosphates, when exposed to directed light, tend to form forms very similar to nervous tissue and vessels, both blood and lymphatic, as well as to forms present in bones, especially tubular ones. Apparently, it is precisely this similarity that allows assuming that the above-mentioned restorative effects of light [1 – 10] are due to its ability to promote the formation of filiform and needle-like structures from phosphates present in nervous tissue, vessels and bones.

Naturally, this assumption takes into account the tendency of all phosphates, including inorganic ones, to polymerize and copolymerize [14, 18]. At the same time, this assumption takes into account the high content of phosphates in the entire human body [19 – 24].

It is probably worth noting here that this same assumption essentially asserts that electrical and electromagnetic forces themselves are capable of providing the described restorative effect of light. Since this assertion may be unfamiliar to clinicians, it is worth analyzing the nature of the forces that cause neural axons to grow toward a laser-illuminated spot (Figure 6). So, given the above-mentioned ability of light to push positive charges in the direction of its propagation and negative charges in the opposite direction [16], it turns out that the spot illuminated by the laser certainly acquires a positive charge. It is therefore quite expected that this spot attracts negative charges, in particular negatively charged ionized phospholipids, which are present in large quantities in the outer neuronal membrane [22]. Thus, it turns out that the stimulating effect of light on axon growth (Figure 6) can be achieved solely by electrostatic and electromagnetic forces, as was asserted.

To make this assertion more convincing, it is worth realizing that the phenomena underlying the action of a laser-illuminated spot on neuronal axons (Figure 6) are similar to the phenomena that determine the therapeutic effect of acupuncture needles, copper coins (Figure 7), and metal nanoparticles that acquire a positive charge upon contact with human tissue [27 – 33].

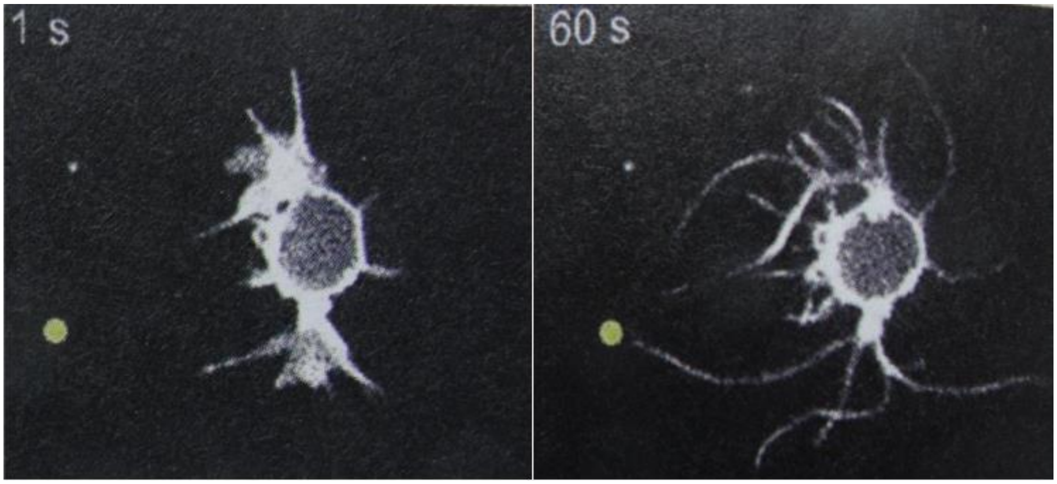

Figure 6. These are magnified images of a neuron located near a laser-illuminated spot (light yellow spot). Both of these images, taken 60 seconds apart, clearly show that axons grow most vigorously in the direction of the laser-illuminated spot, which likely simply attracts these same growing axons [25, 26].

Figure 7. In essence, what is shown here is that the "copper" coin, which, like all metals, absorbs positive charges from aqueous media [14], causes the negative charge of the aqueous solution of K_2CO_3 and, accordingly, its ability to create needle-shaped crystals [33]. As you can see, the "copper" coin orients the crystal needles in the same way that a laser-illuminated spot orients growing axons (Figure 6).

(Apparently, it should be added here that this same assertion should not be taken as a call to completely ignore the ability of light to induce photochemical transformations, in particular those that provide the therapeutic effects of photodynamic therapy [34, 35].)

Conclusion

Thus, it appears that the available data (Figures 4 – 7) allow accepting the idea that correctly directed light can generate electrostatic and electromagnetic forces in the human body, which in themselves are capable of exerting a restorative effect on those tissues of the human body that contain fibrous or needle-like structures, that is, on numerous. In this regard, one would hope that it is this acceptance that will encourage doctors to use only light for therapeutic purposes and, accordingly, reduce the use of drugs, especially those with side effects.

At the same time, it is hoped that this acceptance will increase the attention of doctors to the transparency of the skin of patients, which actually determines the access of light to their insides and, therefore, the ability of the latter to recover under the influence of therapeutic light and to self-repair under the influence of daylight. Apparently, this will also allow a new look at the cause of the age-related decline in the ability of the human body to self-repair and, in particular, to explain it by the age-related dehydration of human skin [36 -38], which apparently reduces its transparency. Thus, it appears that studying the nature of the phenomena underlying the restorative effect of light may help physicians develop a broader view of the connections that exist in the human body.

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