



# Physicochemical Study of Subtle Energy Impact Stemming from Bioenergy Therapists on Water

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## Abstract

The study addresses subtle energy (S.E.) phenomena, which have eluded traditional scientific measurement and understanding. Alongside other phenomena not supported by the contemporary Standard Model of physics, biofield (bioenergy) healing must be included. The research posits the existence of subtle energy or a subtle field that can be researched by an appropriate and protocolized measurement system based on physical chemistry. The study employed the following physicochemical methods: electrical conductivity, pH measurements, and UV/VIS/NIR spectroscopy. It investigated how bioenergy from therapists and depleted individuals affected these parameters vs. bench control. The experiments were conducted with different water types (neutral, acidic, alkaline) to observe the S.E. impact on water's ionic and electric properties. Significant effects of S.E. were observed in conductivity and pH changes across different types of water, confirming the presence and variance of S.E. impacts. Bioenergy therapists generally increased the conductivity and altered the pH away from neutrality, indicating an increase in the water's ordered state. In contrast, tired individuals showed effects that typically moved pH towards neutrality and impacted conductivity less. The findings substantiate the presence and measurable effects of subtle energy, differing between bioenergy therapists and individuals with depleted energy. The study highlights the potential of these measurements to evaluate the properties of bioenergy and its effects on water, with possible broader applications in health and environmental sciences. The findings reinforce the concept of S.E. as a detectable phenomenon, paving the way for new insights into life, health, and disease.

**Keywords:** Energy healing; Biofield healing; Subtle energy (S.E.); Bioenergy; Conductivity; pH measurements; Spectral analysis; Coherent domains

## Introduction

There is a wide range of phenomena that have been the subject of scientific inquiry for a long time but continue to elude conventional measurement, understanding, and explanation. These include the memory of water, biofield (bioenergy) healing, various so-called paranormal phenomena, and, to some extent, dark matter and dark energy. None of these phenomena are accounted for within the current Standard Model of physics. To remain within the bounds of Ockham's razor, they can be tentatively attributed to the existence of a form of subtle energy (S.E.) or a subtle field. This elusive form of energy or field may consist of multiple distinct layers, as proposed by Tiller's model, which includes physical, etheric, emotional, and mental components [1,2]. Of particular interest is the layer of S.E. closest to ordinary matter, as it is the most accessible to empirical scientific investigation. This layer has been referred to by various names in the scientific literature, including the subtle field, biofield, bioenergy, orgone, and ether, among others [3-5]. Regarding the name 'biofield', it was coined in 1994 by a panel on manual medicine modalities convened at the National Institutes of Health (NIH) to discuss complementary

and alternative medicine (CAM) [6]. Notably, orgonomists, starting with Reich, conceptualized a field with similar properties, which they called "orgone." They regarded it as a fundamental component of both inanimate nature (e.g., weather phenomena, solar radiation) and living systems, essential for life and health. To harness and concentrate this energy, Reich developed a device known as the "orgone accumulator," which utilized alternating layers of dielectric and conductive materials. Remarkably, Reich reported its use in cancer treatment, a claim that, while controversial, underscores the potential significance of this form of energy [2,7].

Although we lack a lot of scientific understanding of S.E. as a form of vital energy (bioenergy), it is assumed to surround and penetrate living organisms, playing a crucial role in health, healing, and communication within living systems and among them [8,9]. It is also conceived as transcending its physical boundaries and dynamically interacting with its surroundings. Disturbances or disruptions in the flow of bioenergy are supposed to precipitate disease, while a balanced and unobstructed flow

indicates wellness and vitality [10]. This concept is integral to various traditional healing practices, including Traditional Chinese Medicine (TCM), Ayurveda, and other global traditions, where it is often viewed as a life force that animates and sustains life [11,12]. Bioenergy is considered to influence a broad range of physiological, psychological, and spiritual processes [13,14]. Scientifically, the study of bioenergy spans several disciplines: biophysics investigates the physical properties of living systems, including electromagnetic fields and biophoton emissions crucial for understanding bioenergy [8,15]. Tightly connected is psychoneuroimmunology examining interactions between the mind, nervous system, and immune system and how these interactions influence health and well-being [16]. Quantum biology explores the role of quantum processes in biological systems, which could elucidate the quantum field basis of bioenergy [17]. Bioelectromagnetics investigates a possible electromagnetic nature of bioenergy and related to this, potential therapeutic applications of electromagnetic fields. The theories and experimental evidence discussed in the literature suggest that electromagnetic fields, even extremely weak, may play a significant role in cellular signaling and regulation, thus offering potential therapeutic applications [18]. Since such effects are difficult to explain in a conventional physical way, it is conceivable that they could be triggered by endogenous subtle energy. Additionally, bioenergy is closely linked with the notion of the aura in various spiritual and esoteric teachings, described as a luminous emanation that reflects the physical, emotional, and spiritual states of beings [19].

Based on the above brief review of published scientific research and the more extensive investigations into S.E., we can infer that:

- It is detectable using specific measurement protocols involving living organisms or specialized instruments as transducers, supporting its existence in an objective, physically verifiable manner.
- It evades detection by standard instruments and conventional measurement protocols.
- While it may exhibit certain points of interaction with the electromagnetic field, it also possesses properties that extend beyond it.

These points logically suggest that, despite its elusive nature, S.E. (bioenergy) interacts with physical systems, albeit weakly, and can be empirically investigated under specific conditions. Given the presumed importance of bioenergy in organisms, this also provides clues about where and how it can be best detected. Since (a) organisms are predominantly composed of water and (b) their excitable processes depend on ionic states, it is reasonable to hypothesize that S.E. can interfere with ionization or alter the electric field in aqueous systems. The interaction between bioenergy and the ionic constituents of organisms suggests that this subtle energy, also used in healing, is probably fundamentally

of a dipolar electrical nature. Although this would not directly impact electric charges, it could subtly affect electric fields, dipolar molecular oscillations by exerting influence through resonance mechanisms. Given its dipolar nature and high dielectric constant, water is particularly interesting as a potential receiver and detector of subtle energy. According to a derivation from the theory of quantum electrodynamics (QED) by Preparata-Del Giudice [20-22], water forms coherent domains based on synchronous electronic oscillations. It is reasonable to expect that any electrical oscillations of S.E. to which water is exposed would couple and interact with these synchronously oscillating domains. Here we can assume that, following the same principles as for water, we can expect dipolar S.E. to form coherent domains within their own energy-field domain. According to QED, these domains are spontaneously generated and ordered in polar liquids, as they are thermodynamically favorable [22]. Although the theory of coherent water domains is regarded as speculative by some physicists, it has empirical – albeit somewhat indirect – support. This evidence is based on the exceptionally high dielectric constant of water, the existence of two distinct phases of liquid water with respect to the dielectric constant [23,24], and the Zhadin-Liboff effect, which is explained within the framework of Ion Cyclotron Resonance (ICR) theory [25-27]. Namely, Liboff and Zhadin have independently shown that in an electrolytic cell in which amino acid (glutamic acid) is dissolved in water, an electric current spike occurs after the application of a weak electric voltage in the presence of a weak static (B<sub>dc</sub>) and a very weak dynamic (B<sub>ac</sub>) parallelly aligned magnetic fields. The phenomenon can be satisfactorily explained only by water coherent domains theory [28].

Considering the assumed similarity in electrical dipolarity, we may expect those coherent water domains to act as antennas interacting with S.E. oscillations. From an energetic standpoint, this interaction could cause the S.E. oscillations to either gain or lose some of their energy. These fluctuations can then translate into changes in the physicochemical parameters of the water, such as alterations in the tension of its electric field, resulting in charge separation or the reverse. This expectation is based on the fact that the excited state within the coherent domains has an energy level of 12.06 eV, just below the ionization energy threshold for charge separation, which is 12.6 eV [29]. A relatively minuscule, but resonantly tuned, electrical fluctuation can, therefore, dislodge electrons from their bound state, altering the electrical tension [30]. Our previous research supports this assumption, as we found that the interaction between S.E. and coherent water domains increased the electrical tension of water, as evidenced by ORP measurements [31, 32]. Another instance of this phenomenon is the spontaneous generation of electrical potential in the so-called EZ water, which is considered by theoreticians of ordered water domains to be an extended coherent domain [33,34]. The beneficial influence of normal S.E. (bioenergy) on life processes, where a positive effect on the coherent states of water domains can be anticipated, is also supported by Fröhlich's theory [35]. Fröhlich postulates that the health of an organism depends on

the coherence of dipolar oscillations in its cells. These coherent cellular oscillations are believed to orchestrate the complex biochemical reactions essential for organized life and are disrupted in cancerous tissue [36].

Thus, the fundamental theoretical premise suggests that supplying a dense S.E. field from bioenergy therapists to a human organism impacts its cellular water. This process enhances the endogenous coherent oscillations of the water, consequently facilitating healing by

- Restoring the rhythmic oscillations of the organism's bioelectromagnetic field that may have been disrupted,
- Raising the voltage in cellular or mitochondrial membranes that may lead even to re-differentiation of a cancerous cell as hinted and further elaborated in the works by Sundelacruz et al. [37], and Levin [38].

It follows from these general assumptions that we could measure the S.E. of bioenergy therapists through their effect on water. In this case, we expect that the values of some physicochemical parameters of the water will change when exposed to the therapists in the S.E. emanating state. In the field of bioenergy and biofield phenomena, researchers have employed a variety of methodologies to explore the possible effects of bioenergy on different systems, including water experiments [39], random event generators, noise field counters, Geiger counters, studies made on human organisms [40], and other organisms [41]. Previous research on the influence of human interaction and bioenergy on water and other materials and even organisms has yielded significant results, although the field remains controversial and requires further investigation. Some findings include water crystal formation (freezing) introduced by Masaru Emoto [42]. Other studies have tackled bioenergy detection via physicochemical methods. For instance, a study by Rein [43], and Matos [44] found that the electrical conductivity of water increased after being treated by energy healers. However, these findings have not been consistently replicated, and the underlying mechanisms remain unclear [44]. The directional intent of 286 qualified biofield therapy practitioners who meditated at a distance to alter the state of water molecules in specific flasks also affected the pH measurement system with possibly changing the properties of the electrode's internal electrolyte. Namely, this intention-mediated conditioning caused consistent pH fluctuations, which ceased after the electrolyte in the electrode was replaced, indicating an influence on the measuring device [44,45]. Similar effects, such as increased conductivity and pH in water treated with magnetic fields, have been reported by other researchers [46]. In addition to these findings, UV/VIS/NIR spectroscopic methods have been employed to investigate the effects of focused intention on water properties [44]. The results showed notable variations in the UV (175-375 nm), UV/VIS (375-575 nm), and VIS/NIR (575-954 nm) bands during the intention time-window. Specifically, there was a marked increase in relative absorption intensity in the UV range and significant variability

in the VIS range, with increased frequency of spectral changes and higher intensity. In the NIR range, fluctuations in intensity and dispersion were observed, indicating changes in the spectral properties during the experimental period. Besides, there are findings suggesting that focused intention may also influence the light-scattering properties of water, although further investigation is needed to understand the underlying mechanisms [44].

In our present study, we have focused on already well-established and protocolized methods such as measurement of electrical conductivity (c), pH, and UV/VIS/NIR spectrometry. Regarding conductivity and following particularly the ICR theory [27], we expected that the S.E. impact on water would knock out some ions from the surface of the coherent domains, thereby slightly increasing the conductivity of the detection liquid. A similar phenomenon has been observed in numerous studies regarding the detection of vigorously shaken highly diluted solutions [47-50]. Regarding the pH measurements of receptive waters, building on our previous investigations and theoretical considerations, we hypothesized that S.E. from bioenergy therapists interacting with exposed water would induce slight auto-ionization of water [51]. This would result in a decrease in pH in acidic water and an increase in pH in alkaline water. Additionally, we anticipated that a stronger S.E. impact, leading to further ion dissociation, would cause a more significant deviation from neutral pH, at least with alkaline waters. Furthermore, we expected that otherwise identical source waters, adjusted to different pH levels, would detect the S.E. impact differently due to their varying ionic compositions. Generally, we also anticipated that an alkaline receptive water would be more sensitive to detecting the S.E. impact, since it has been found that coherent domains tend to form on the basis of negative charge. Negatively charged hydration shells around hydroxide ions extending into coherent domains would be relevant here [33]. As a review by Yinnon shows, UV/VIS/NIR spectrometry of serially diluted and vigorously shaken solutions, presumably based on similar mechanisms as proposed here, is likewise a good marker of their ordered states [52]. Here, different wavelength band maxima are given (see [31] for more detail). In EZ (exclusion zone) water research, i.e., the layer of water adjacent to the hydrophilic surfaces, which has been thoroughly investigated, in particular by Prof. Pollack's team, a broad peak absorption is regularly found at 270 nm [53,54]. In specially treated and presumably highly ordered MiliQ water, a UV absorption band (around 300 nm) was found [55]. According to theoretical considerations, coherent domains postulated in QED should be the main agents for a universally detected higher UV absorption of dynamically ordered UHD water solutions [52]. In our study, we selected FIJI water as the S.E. detecting water. The decision was based on the following considerations. Firstly, FIJI water is already recognized within the scientific community, having been successfully utilized in previous research exploring the effects of bioenergy therapists on water [56]. Furthermore, our decision to use this water was based on its similar concentration of hydrogen carbonate anion as used in our previous experiments devoted to detect very weak signals from water [31,32,57].

In designing the study, we incorporated not only a control, consisting of water placed on a laboratory bench and treated identically to the water exposed to the S.E. therapists, but also a contrasting condition where the water was exposed to depleted (fatigued) individuals under the same experimental setup. We anticipated that the differences would be generally greater between these individuals and therapists than between the therapists and the bench control. In other words, we anticipated that bioenergy therapists would emit a more ordered and potent S.E., whereas fatigued individuals would emit a significantly less ordered or potentially disruptive S.E. This allowed us to test a theoretical assumption derived from various sources, particularly ergonomists: the dichotomy between ordering, health-promoting S.E. (OR), and dissipative, disordering, health-compromising S.E. (DOR) [58].

## Material and Methods

### Material and devices

#### Water used for the detection of bioenergy

##### Original Fiji water

For the fundamental receptive water, we used FIJI Water, sourced and bottled in Viti Levu, Fiji Islands. Originating 1,600 miles from the nearest continent, it's naturally filtered through volcanic rock in a rainforest, gaining minerals and electrolytes. The water emerges from a deep artesian aquifer, protected by rock layers, and is bottled directly at the source. General mineral analysis of FIJI water (as of March 2023): 140mg/L of bicarbonate, 18mg/L of calcium, 9mg/L of chloride, 0.3mg/L of fluoride, 13mg/L of magnesium, 16mg/L of sodium, 85mg/L of silica and 0.5 mg/L of sulfate. Total Dissolved Solids 220 mg/L. Total alkalinity 260 mg/L. The declared pH was 7.61.

##### Further Processing of FIJI water to attain three targeted receptive waters

The study aimed to evaluate the effects of bioenergy therapists on receptive water with three different pH values, including mildly acidic, neutral, and mildly alkaline. To achieve the targeted acidic pH (5.5), we used citric acid, a common mammalian metabolite (Sigma-Aldrich, Merck KGaA, Darmstadt, Germany). For calibrating the neutral pH (~7) and an alkaline pH (8.5), sodium hydroxide (Fluka, Honeywell Research Chemicals, Charlotte, North Carolina, US) was used.

### Measurement Devices and Methods

To evaluate the impact of bioenergy therapists on water, we employed various physicochemical methods and spectroscopic techniques. These included measuring electrical conductivity and pH and conducting relative absorption analysis across the UV/VIS/NIR spectrum. The spectrum was divided into eleven spectral bands: UV-C (200-280 nm), UV-B (280-315 nm), UV-A (315-400 nm), violet (400-450 nm), blue (450-485 nm), cyan (485-500 nm), green (500-565 nm), yellow (565-590 nm), orange (590-625 nm),

red (625-750 nm), and infrared (750-898 nm). We used Mettler-Toledo's Seven Excellence S470 (Greifensee, Switzerland) for measuring pH and conductivity. To ensure the integrity of our data, we incorporated simultaneous temperature measurements as a control measure, which is important especially with conductivity. Each individual measurement was conducted in a separate beaker. The measured range of accuracy (which deviates from the officially declared value and is not part of the observed, investigated, and considered measurement drift) for pH is  $\pm 0.05$ . For conductivity measurements, the use of a double steel pole cell with a built-in temperature probe effectively eliminates measurement errors. For the UV/VIS/NIR absorption spectroscopy measurements, we used a Nanocolor® UV/VIS II spectrophotometer from Macherey-Nagel (Düren, Germany), with a wavelength range of 190–1100 nm and a 50 mm quartz cuvette cell. The measurement accuracy was within  $\pm 1$  nm for wavelength and 0.003 for relative absorption. To obtain spectroscopic data, we employed a zero solution to zero the instrument for the solvent in which the compound was dissolved. Each measurement was conducted in a dedicated cuvette that was consistently used throughout the entire experiment. Before each new measurement, the cuvette was thoroughly cleaned to ensure the accuracy and reliability of the results.

### Experimental protocol

#### Bioenergy Healers (Therapists) and Depleted Human Volunteers

Based on our long-standing practice of testing bioenergy therapists through physiological measurements, we have selected five suitable candidates for this study, each with formal consent. We have also made a special selection for depleted humans from among the volunteers who otherwise take part in other tests carried out at our Institute as test subjects. They had to agree to the purpose and procedure of the research itself. Since they had to be tired or even stressed during the study, we gave them specific instructions. Although the therapists and depleted volunteers had different instructions before the study itself, they were subjected to the same protocol within the experiments. Therapists were told to energize the water, while the volunteers were told to refrain from focusing on or influencing the water, to maintain an appropriate state for experimental situations.

### Experimental design

We conducted five separate experiments over five weeks, exposing three types of water (acidic, neutral, and alkaline) to each of the three experimental situations (Bioenergy, Depleted human (entropic), and Control) during each week. It resulted in five replicates for each type of water under three situations.

### Experimental situations

The same procedure was performed with all volunteers (therapists and Depleted humans) with three types of FIJI water (neutral, acidic, and alkaline).

Water samples were exposed to three different experimental situations:

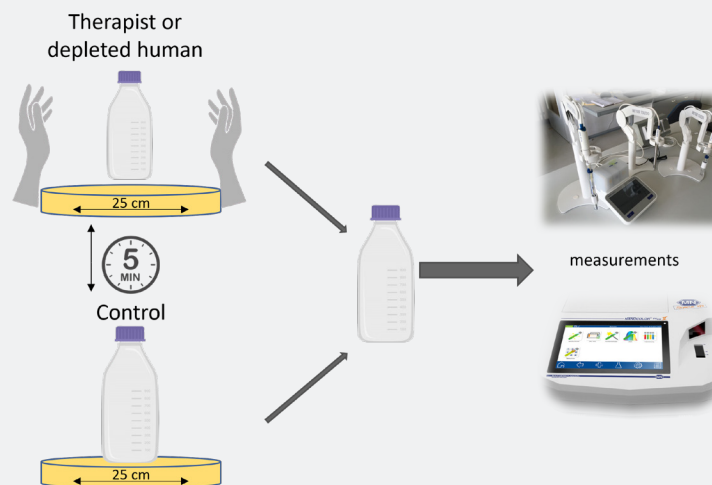
- Bioenergy (B): water was exposed to the therapist's assumed healing S.E. emanation;
- Depleted human (D): water was exposed to the assumed fatigued human S.E. emanation; and
- Control (C): water was placed in an empty room under identical environmental conditions without external influences.

These situations occurred in three different rooms: Bioenergy

in the first room, Depleted human in the second, and Control in the third room. In the experimental situation, 250 ml bottles (Rasotherm® GL 45, Meiningen, Germany), each filled with 130 ml of FIJI water, were placed on a wooden base. The base was specifically designed with a diameter of 25 cm, ensuring that there was no direct physical contact between the bottles and either the therapist or the human control subject, with a separation distance of 10 cm. The exposition of a receptive water bottle lasted 5 minutes, equally for therapists and the human subjects (see Figure 1). Figure 2 illustrates the experimental setup and schematizes the experimental procedure.



**Figure 1:** An example of the bioenergy (B situation) or fatigued human S.E. emanation (D situation) with a bottle containing receptive water placed on a wooden base.



**Figure 2:** The experimental setup was designed to measure the S.E. emanation's impact on the receptive water. In experimental situations, a therapist or a fatigued volunteer placed their hands at a determined distance from a water bottle for 5 minutes. A control water bottle was subjected to identical environmental conditions without human interaction. Following the exposure period, measurements were conducted on all receptive water bottles.

## Blinding

The experiment was conducted in a double-blind design, to ensure objectivity and eliminate bias. Both the measurement group and the analysts were blinded to experimental situations. Each experimental situation (B, D, and C) was randomly labeled with A, B, or C, resulting in labels ranging from 1 to 18 for each repetition of the situation. Receptive water samples were thus initially placed in bottles labeled A, B, and C. An assistant, uninvolved in measurements or data analysis, randomly assigned labels to the corresponding experimental situations and transported the labeled bottles to the designated rooms. After 5 minutes, the bottles were collected and taken to the laboratory for measurements. This procedure was repeated for all 17 remaining samples. The identity of each experimental situation was disclosed only after statistical analysis for all three experimental situations was completed.

## Sequential Process Management

The pouring and measuring procedures were carried out systematically and in variable order to avoid possible systematic measurement errors due to gradual (even if slight) measurement shift over time. It is particularly important in pairwise statistical comparisons, where a significant difference can be obtained only due to a gradual shift in the measurement values over time.

## Measurement Protocol

For the physicochemical measurements, the treated water samples were transferred from the bottles into beakers prior to conducting the measurements. Both physicochemical parameters (conductivity, pH) and temperature were measured simultaneously in their own separate beakers using the variable-order measurement method. Spectroscopy measurements also used a variable-order method. For these measurements, the water from previously exposed bottles was poured into a 50 mm quartz cuvette. All exposed waters, including the Control, were diluted to a 50% ethanol solution and tapped 15 times on the glass of the vial with an automatic tapping device at a frequency of approximately 4 Hz before being poured into a cuvette. The zero-solution cuvette was not subjected to tapping.

## Statistical Analysis of the Results

For estimating statistical significance, we applied appropriate tests regarding normality and the number of situations. In the case of the normal distribution, we used ANOVA; otherwise, we used the Friedman test. For post hoc analysis, we subjected the situations to a post hoc t-test (normal distribution) or/and Wilcoxon signed-rank test. When integrating the outcomes of more experiments, we used the Sign test for statistical evaluation. All tests were performed via pairwise comparison. In cases where the Friedman test did not show overall statistical significance, we proceeded with a post hoc analysis using the Wilcoxon signed rank test. This decision was based on the recognition that differences in

statistical results may arise due to issues of multiple comparisons and statistical power. The Friedman test, evaluating all situations simultaneously, may fail to detect differences across all situations, particularly when only some pairs differ significantly. Conversely, the Wilcoxon test, focusing on pairwise comparisons, offers greater sensitivity in detecting specific differences.

Statistical data analysis was performed using XLSTAT statistical software (XLSTAT PREMIUM-Evaluation 2022.3.1) for Excel. For basic statistical parameters of situations, we calculated the average, standard deviation, standard error, and normality with the Shapiro-Wilcoxon test. To estimate statistical significance in the data variation, we used Levene's test (based on median) or F-test for differences in variance and Cohen's D for assessing standardized effect size. Differences are considered statistically significant when  $p < 0.05$ . A statistical trend is identified when the p-value falls within the range of  $0.05 < p < 0.1$ .

## Normalization in multi-experiment evaluation

Given the considerable variability observed within individual experiments conducted with bioenergy therapists and in pursuit of a deeper understanding of the bioenergy therapists' effects on water, including discerning specific patterns, we undertook the integration of data from various distinct experiments. This integration entailed, for instance, combining data derived from an experimental situation but involving three different pH types of receptive water. Such a process necessitated normalization to ensure comparability and minimize statistical noise across datasets with disparate mean values. That was particularly crucial for assessing statistical significance in cases where data were integrated from multiple experiments. Normalization was executed through two methodologies. In the first approach, we selected a reference dataset and its Control situation (C1). We then calculated the difference between the average Control value of C1 and that of subsequent sets (C2, C3, etc.) and algebraically adjusted all values within these sets by this differential. This method was applied to the UV/VIS/NIR results. In the second approach, we normalized the values within each dataset by dividing them by the average Control value of their respective set. It has been applied to physicochemical measurements.

## Results

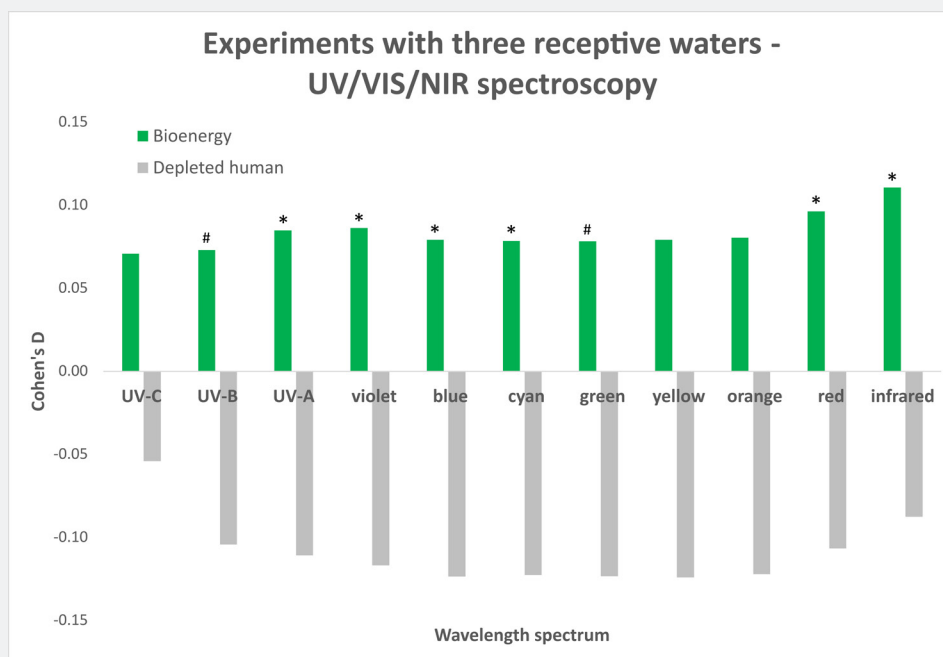
### UV/VIS/NIR Measurements

The results of the normalized integrated data from three pH types of receptive waters are presented in Figure 3. This graph demonstrates that the relative absorption of the Bioenergy situation is the highest across the entire wavelength spectrum, while the Depleted human situation exhibits the negative absorption. The Friedman test revealed a statistical trend for UV-A ( $p = 0.104$ ), blue ( $p = 0.101$ ), and cyan ( $p = 0.064$ ) wavelength spectra. Post hoc analyses showed a statistical trend for the UV-B and green bands for the B situation. All spectral ranges, except for the UV-C, yellow, and orange wavelengths, showed statistically

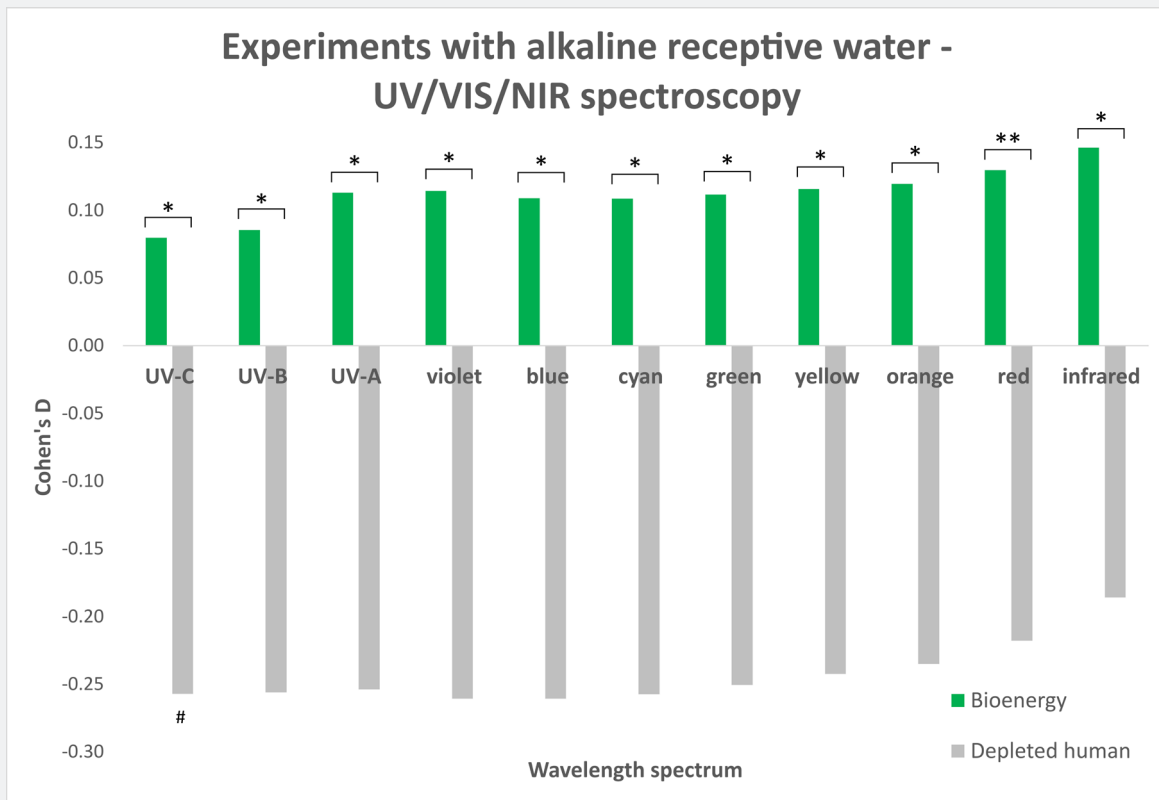
significant differences in the B situation. In analyzing the effects of the alkaline receptive water, a statistical trend was observed in the Friedman test for blue ( $p = 0.084$ ) and green ( $p = 0.077$ ) wavelengths. Statistically significant differences were observed for yellow ( $p = 0.032$ ) and orange ( $p = 0.033$ ) wavelengths. Post hoc analysis revealed that the most pronounced differences between the two situations across the entire spectrum were found in alkaline water (Figure 4), with consistent statistical significance between B and D observed across all wavelengths. Notably, B exhibited positive absorbance throughout the spectrum, while D showed even higher rates but in negative absorbance across the same range. Thus, the difference between the two tested groups is very conspicuous.

Statistical analysis of the experimental data obtained from

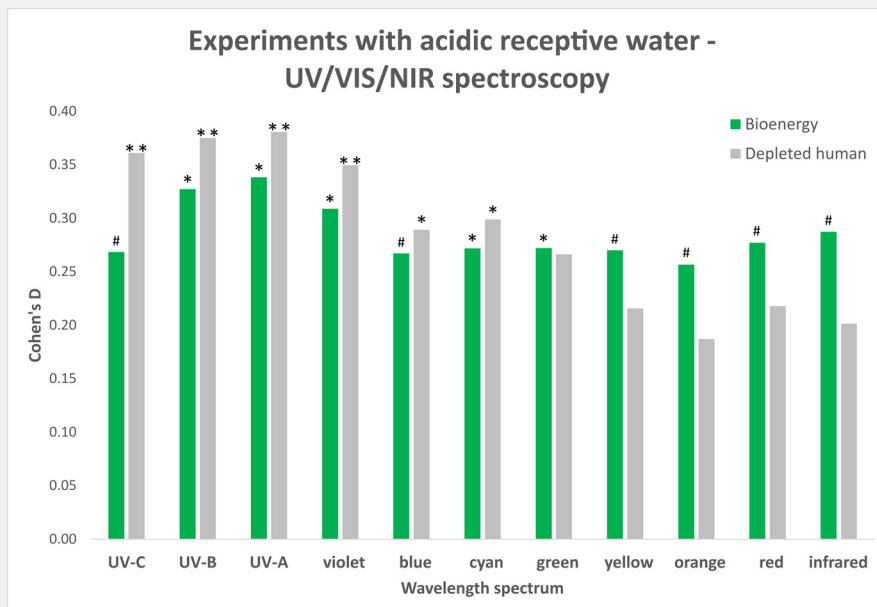
the acid receptive waters revealed interesting differences. The Friedman test demonstrated statistically significant differences for the UV-A ( $p = 0.020$ ) and violet ( $p = 0.043$ ) bands and statistical trends for the UV-C ( $p = 0.059$ ), blue ( $p = 0.084$ ), and cyan ( $p = 0.087$ ). In contrast to the observations from the alkaline receptive water, the trend in acidic water demonstrates a reverse pattern, as illustrated in Figure 5. Post hoc analysis shows that D exhibits a higher absorbance compared to B, which is statistically significant relative to C, particularly from the UV-C to the cyan band. Conversely, in the range from the green to the infrared bands, the B situation demonstrates a slightly higher positive absorbance and exhibits either a statistical trend (UV-C, blue, yellow, orange, red, and infrared) or statistically significant differences (UV-A, UV-B, violet, cyan, and green) throughout the entire observed spectrum.



**Figure 3:** Relative mean values of Cohen's D for the UV/VIS/NIR relative absorption measurements with all three pH types of receptive water ( $N = 252$ ). Marks: #:  $p < 0.1$ , \*:  $p < 0.05$ . Marks above the bars indicate statistically significant differences compared to the Control situation ( $= 0$ ), as determined by post hoc analysis.



**Figure 4:** Relative mean values of Cohen's D for the relative absorption of eleven spectral bands with alkaline receptive water (N = 84). Marks: \*: p < 0.05, \*\*: p < 0.01. Marks above the connecting line between bars indicate statistically significant differences between the two situations compared, as determined by post hoc analysis. Control situation (= 0).

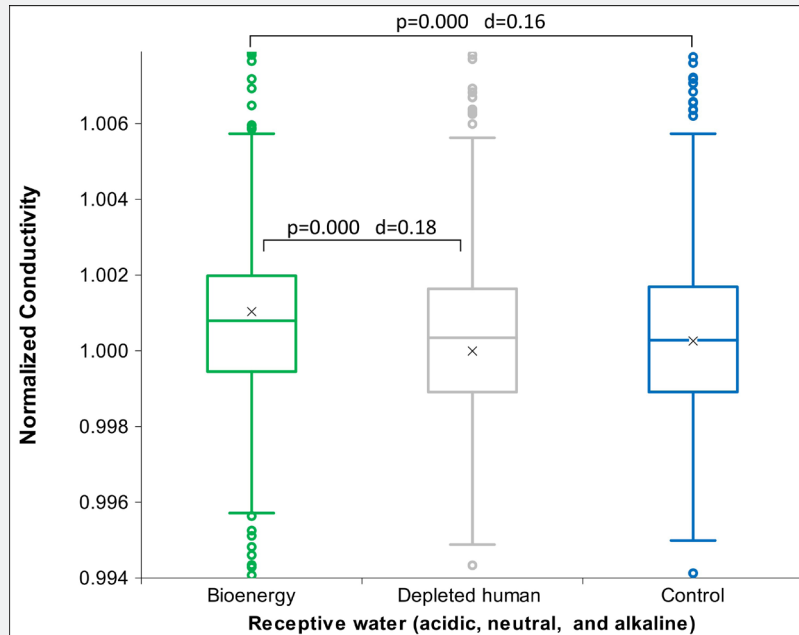


**Figure 5:** Relative mean values of Cohen's D for the UV/VIS/NIR relative absorption measurements with acidic receptive water (N = 84). Marks: #: p < 0.1, \*: p < 0.05, \*\*: p < 0.01. Marks above the bars indicate statistically significant differences compared to the Control situation (= 0), as determined by post hoc analysis.

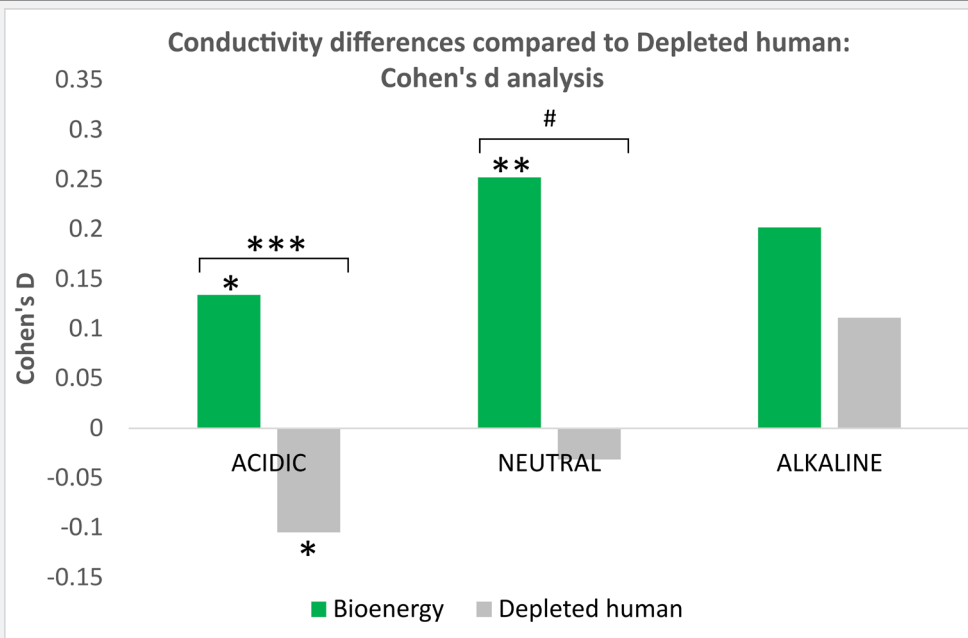
Physicochemical Measurements

Starting with conductivity, by normalizing the results for the three pH types of receptive water within each of the B, D, and C

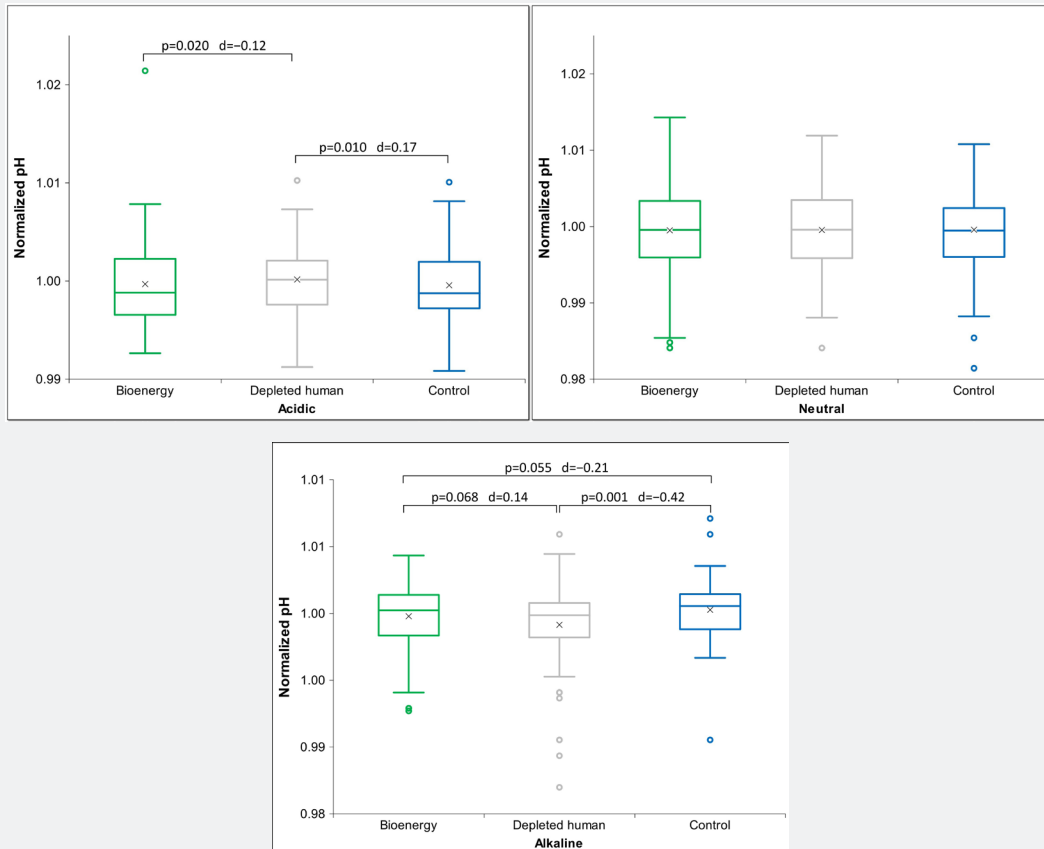
situations separately, the statistical analysis indicates that when bio energy therapists are involved, the conductivity is higher (Figure 6).



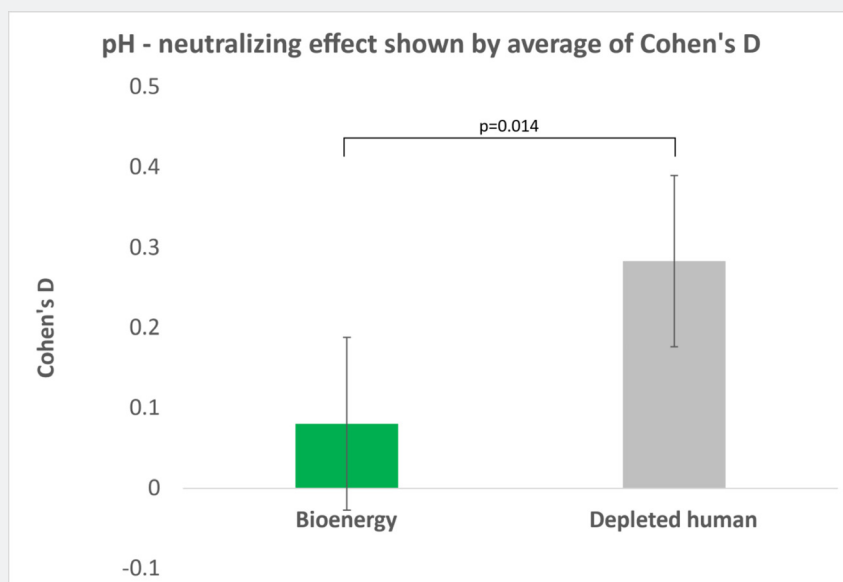
**Figure 6:** Box plot of normalized conductivity across all three pH types of receptive water and three experimental situations. Box plots present the median and quartiles, with circles representing outliers and an 'x' annotation indicating the mean, for (N = 270). Significances of post-hoc analyses (p-values and d-values) are presented, too..



**Figure 7:**Relative mean values of Cohen's D for the conductivity measurements with all three pH types of receptive water, (N = 90). Marks: #: p < 0.09, \*: p < 0.05, \*\*: p < 0.01, \*\*\*: p<0.0001.



**Figure 8 :** Box plot of normalized pH (a) acidic, (b) neutral, and (c) alkaline receptive waters across all experiments. Box plots present the median and quartiles, with circles representing outliers and the 'x' mark indicating the mean (N = 90). Significances of post-hoc analyses (p-values and d-values) in differences are presented, too.



**Figure 9:** Graphical representation of relative Cohen's D values illustrating the pH-neutralizing effect. To demonstrate this effect, the mean d-values of alkaline and acidic receptive waters were used. For the alkaline receptive waters, the d-values were reversed, as in an ordinary presentation, a positive d-value would stand for a higher pH, signifying an ionizing effect, i.e., distancing from pH = 7. The difference between D and B is statistically significant (N = 10).

The Friedman test shows statistical significance among three situations ( $p = 0.000$ ). Post-hoc analysis reveals significant differences between B situation and the other two. The result comprising 270 pairs is highly statistically significant ( $p = 0.000$ ). The relations are presented in Figure 6. In terms of the different pH types of receptive water, the mean Cohen's D values are consistently higher for B, indicating a positive Cohen's D in comparison to both D and C (Figure 7). As shown in Figure 7, no statistically significant difference is observed for alkaline water. However, a statistically significant difference is shown for acidic and neutral waters, both in comparison to the control (for B and D) and between B and D themselves. For neutral water, we can see the largest and highly statistically significant increase in conductivity for B. Interestingly, the pH of this water is very close to the pH of human blood. Fatigued individuals showed no effect here. The pH measurements exhibited notable differences, as seen in Figure 8. The Friedman test revealed statistically significant differences between acidic and alkaline water ( $p = 0.021$  and  $p = 0.002$ , respectively; see Figures 8a and 8c). However, no statistical differences were observed with the neutral water (see Figure 8b). For fatigued volunteers (D) relative to the Control situation (C), a neutralizing effect is observed, with pH values approaching 7 on both sides, particularly for acidic and alkaline waters (Figures 8a and 8c). In contrast, for the therapists (B) in relation to D, an ionizing effect is evident for acidic water, as the pH shifts further towards acidity. However, it remains comparable to the Control situation (Figure 8a). For alkaline water, however, a neutralizing effect for B is observed, with the pH decreasing towards a value of 7 compared to the Control (Figure 8c). If we consider only acidic and alkaline receptive waters, a neutralization effect is observed, either in the B:C or D:C comparison, with the latter showing a stronger effect, as shown in Figure 9.

### Discussion

In preparing the research on S.E. originating from bioenergy healers and fatigued volunteers, we made several assumptions discussed in the Introduction. Our underlying tacit assumption was that by using our previously developed measurement protocols for detecting subtle effects on water from highly diluted solutions [31,32,57]. With bioenergy therapists we would successfully reflect differences in subtle energy. A series of experiments not only confirmed this hypothesis but also validated our explicit expectation that, in general, the differences between the S.E. of therapists (B) and Depleted humans (D) would be greater than between the therapists and the bench control (see Figures 6, 7 for conductivity measurements, and Figures 3, 4 for spectral bands). The observation also supports another assumption, namely, that there are two modalities of S.E.: one health-promoting (enhancing orderliness) that can be called bioenergy (at least in a narrow sense) and another the opposite, disruptive, enhancing entropy, which could be roughly compared to the atmospheric energetic stagnation concept described by DeMeo [58] and Reich's concept of deadly orgone (DOR) [59].

Regarding hypotheses about conductivity, we followed the ICR theory discussed and referred to briefly in the Introduction. We expected that the S.E. impact on water would knock out some ions from the surface of the coherent domains, thereby slightly increasing the conductivity of the detection liquid. However, it could also strengthen orderliness of water, thereby raising its conductivity following the proton hopping mechanism [60,61]. In any case, the hypothesis was validated, even when all experiments comprising 270 measurements for all three pH types of receptive water and all five therapists (especially between B and D situations and between B and C) were evaluated (Figure 6). These findings align with observations presented in the paper of Kernbach et al. [62], which investigated the impact of weak emissions on water parameters such as conductivity and pH. Looking in more detail at the results of the conductivity measurements concerning the pH of the receptive water and the two varying sources (B and D), the following important observation emerges. For all three kinds of receptive water, bioenergy therapists expressed higher conductivity than fatigued volunteers (Figure 7), which is in line with expectation. The most significant difference between B and D can be observed for acidic and neutral waters, where therapists proved to have a positive (higher conductivity) effect. In contrast, fatigued volunteers have the highest negative score. It leads us to hypothesize that, according to the neutral control (C) and in line with our assumptions, therapists emit a more ordered S.E., whereas the S.E. stemming from fatigued human organisms tends to be more disruptive or entropic, especially when it comes to conductivity mechanisms bound to Grotthuss mechanism of proton transfer that predominates in acidic solutions [63].

For the pH measurements, we assumed that an increase in bioenergy emanation would result in greater ions' dissociation, consequently causing a more pronounced deviation from the neutral pH (pH ionization effect). Again, we can look at the situation regarding the kinds of receptive waters. Focusing on the therapists (B), we find that, in relation to volunteers (D), there was a statistical decrease in pH for acidic water (Figure 8a), and alkaline water (Figure 8c), and a decrease for alkaline water in relation to C; Figure 8c. These results indicate that the therapists produced a relatively mild neutralizing (deionizing) effect, only observed with alkaline water. It may be a consequence of reducing the auto-ionization of water, similar to decreasing the temperature. To our surprise, this neutralizing effect was even more pronounced in pH measurements of all three types of receptive water exposed to fatigued volunteers (Figure 9), being statistically significant even with acidic water. It may indicate interference with both types of water ions, hydronium and hydroxide, reducing their activity, possibly by making them more tightly bound to their hydration shells. Regarding UV/VIS/NIR relative absorption rate, our working hypotheses propose that higher bioenergy irradiance would correlate with supporting coherent domains in water, leading to increased absorption at least in the UV range, while we may expect the opposite for a fatigued human organism. Figure 4 illustrates

that expectations are largely achieved for alkaline water across the entire observed spectral range. When examining the relative absorption of B and D against C (set to zero) across spectral bands for both acidic and alkaline receptive water, it becomes evident that the effects for alkaline water align with our expectations and correspond to the theoretical model. The case is notably different with acidic waters (Figure 5). While the measurement values of therapists' S.E. remain positive (increased absorption), the effect changes with fatigued volunteers, resulting in highly positive absorption, which is statistically significant from UV-C to cyan range. This difference in absorption suggests that alkaline and acidic receptive waters react oppositely to more disruptive S.E. yet maintain the same general response to the more ordered S.E. of therapists, with similar Cohen's D values. This disparity suggests that acidic water with its preponderance of hydronium ions may be more responsive to detecting energy from disruptive S.E. In alkaline receptive waters, the situation is reversed (Figure 4), which is consistent with evidence that EZ water is negatively charged and alkaline, as well as with theoretical predictions regarding negatively charged coherent domains [22,33,64]. These domains may interact with ordered S.E. in a manner distinct from acidic water, which is dominated by H<sub>3</sub>O<sup>+</sup> ions. Further research is needed to validate this hypothesis, which could provide a basis for distinguishing between dissipative and ordering natures of S.E.

A comparison of Figure 5 and Figure 7 reveals that for condition B and acidic water, both methods-conductivity and UV/VIS/NIR spectroscopy-demonstrate a positive effect. According to our hypotheses, this indicates greater molecular ordering and stronger absorption, even in the presence of predominant hydronium ions. In contrast, the S.E. emitted by fatigued volunteers appears to disrupt the Grothuss proton transfer mechanism (resulting in reduced conductivity, as shown in Figure 7) while concurrently enhancing absorption. This study shows that relatively basic measurements of water can differentiate the effects of a bioenergy healer and a fatigued individual and, by inference, their subtle energy. By continuing this line of research, we might one day better understand the uncharted territory of subtle energy, its underlying mechanisms, and modalities. Of course, this is a vision based on the outcomes of what is still largely pilot study, and much further systematic research will be needed to bring this vision closer to reality.

## Conclusion

The study not only corroborates the working hypotheses but also opens new avenues for further research into distinguishing the various modalities of S.E. originating from human organisms, whether from therapists or ordinary individuals. The key confirmations and findings of the present study are outlined below.

- The study confirms a variety of effects of S.E. on water and also demonstrates that relatively basic measurements of water can be used to distinguish bioenergy therapists from fatigued individuals according to their S.E.

- Bioenergy therapists exhibited statistically significantly higher conductivity in receptive waters than fatigued ordinary individuals. As this effect was most pronounced in neutral water, where at the same time there was no detectable effect on pH (ionization), we may infer that the emanation of S.E. from the therapists mainly raised the dynamic orderliness of the water.

- Across all three pH water types, relative absorbance across the spectrum shows positive and mostly statistically significant values for therapists, while the emanation from ordinary individuals results in negative absorption with no statistical significance (Figure 3). This difference is particularly pronounced in alkaline water (Figure 4). Notably, in the case of acidic water, relative UV/VIS/NIR detection reveals positive values for all wavebands for both therapists and ordinary individuals (Figure 5).

- When comparing therapists and ordinary individuals across the three pH types of water, a significant correlation emerges between absorption and conductivity. Specifically, while the values remain consistent for therapists, they are reversed for ordinary individuals (acidic vs. alkaline), as illustrated in Figures 4 and 5 (absorption) and Figure 7 (conductivity). This variation in detection according to the pH of the receptive water strongly suggests a difference in the quality (modality) of the S.E. between therapists and ordinary individuals.

- The overall effect on pH can be characterized as neutralizing (shifting toward pH = 7). Once again, therapists differ notably from ordinary individuals, with the latter exhibiting a more consistent and distinct effect. This further highlights the differing modalities of emanation between therapists and non-therapists.

## Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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