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## EVIDENCE FOR A BIO-ENERGETIC INFLUENCE ON HUMAN DNA IN-VITRO: EFFECTS OF RECONNECTIVE HEALING PRACTITIONERS

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### ABSTRACT

*Context:* A previous hypothesis proposed a key role for conformational changes in macromolecules like proteins to mediate the biological effects of Healing Arts practitioners. This mechanistic hypothesis is supported by preliminary results by the author indicating healers could change conformation of purified DNA in aqueous solutions. *Methods:* Aqueous solutions of purified human DNA were treated with heat to partially unwind the two strands. A spectrophotometer was used to immediately monitor the spontaneous rewinding kinetics, a measure of the self-healing capacity of DNA, in the presence or absence of Healing Arts practitioners. *Result:* Using the same procedure as a previous study that showed different Healing Arts practitioners slowed down the rate of rewinding, Reconnective healers caused an increase in the rate of rewinding when compared with untreated controls. *Conclusions:* These results indicate that different states of consciousness associated with different healing modalities can produce opposite effects on the rate of DNA rewinding following heat shock. A model is proposed to explain a feasible mechanism for how conformational changes in biomolecules can mediate the self-healing response of DNA to the biofield energy of Healing Arts practitioners.

KEYWORDS: Healing practitioners, human DNA, conformational changes, self-healing

## INTRODUCTION AND BACKGROUND

Numerous studies have shown the clinical efficacy of healing arts practitioners (1). The term 'biofield therapy' has recently been introduced by the NIH, adopted by the emerging field of Complementary and Alternative Medicine and accepted by the US National Library of Medicine. The mechanisms by which physiological changes are produced are still unknown. It is proposed that a specific intentional state of consciousness of the healing arts practitioner causes an electromagnetic (EM) information transfer which is mediated by the biofields of the healer and healee (2,3,4). Others have previously proposed that consciousness itself is the carrier of bioenergy and that the source of these energies is the mind, not the brain [Add how you distinguish these two.](5). One experimental approach being taken is to examine specific biochemical pathways or key biomolecules within these pathways as mediators of the bioenergy healing response. Previous authors have shown that healers can change biochemical pathways such as DNA synthesis (6, 7,8), individual enzymes such as trypsin (9) or MAO (10) and individual biomolecules such as hemoglobin (11,12), IgA (13) and DNA (14,15).

An alternative approach to address the mechanisms of healing bioenergy would be to measure structural (conformational) changes in key biomolecules, rather than their functional activities. This approach has already been achieved with EM fields which are known to alter the conformation of proteins (16) and DNA

(17). With regard to biofield energy, it has been previously shown that healing arts practitioners can alter the secondary structure of human DNA by changing its ability to wind or unwind (14, 15). Subsequently, Strickland proposed that such conformational changes could offer a mechanism of action for healing arts practitioners (18).

Changes in the secondary structure of macromolecules are of particular interest because of the key role of hydrogen bonds as the primary electrostatic attractive force that holds biomolecules together. In the case of DNA, hydrogen bonds hold the two nucleotide strands together, forming the double helix conformation (19,20). Since electrons within hydrogen bonds have the interesting capability of quantum tunneling (21,22), winding and unwinding of the two DNA strands can be considered a quantum process.

A previous study with healing arts practitioners measured the rate of DNA rewinding after partially separating the two individual strands (15). The results indicated that Reiki and Qi-Gong healing arts practitioners slowed down the rate of rewinding, despite the conclusion from an even earlier preliminary study (14) that other healers could either wind or unwind the DNA helix, depending on their intention. The present study uses the same experimental protocol as in the 2002 study with Reconnective Healing practitioners and demonstrates that Reconnective Healing practitioners consistently speed up the rate of DNA rewinding. Thus, although all practitioners modulate the rate of DNA rewinding, practitioners from various healing arts schools affect the rate

differently. The implications of these findings will be discussed.

## **PURPOSE**

Reconnection Healers claim they are accessing a different type of energy and are now making it available to humankind for the first time in history. In order to validate and support such a statement, three Reconnection practitioners were studied to determine whether they have a unique effect on DNA rewinding compared to other types of healers who were evaluated using the same in-vitro bioassay.

## **MATERIALS**

Human double stranded DNA fragments were purchased from Sigma-Aldrich. Low-grade distilled water (with trace amounts of minerals) was purchased from a local supermarket and decapped for 24 hours before use to equilibrate atmospheric gases.

## **METHODS**

The standard biochemical assay for DNA renaturation (19,20) was used with some modifications. A stock solution of human placental DNA (Sigma Chemical Co., St. Louis) was prepared at a concentration of 0.4 mg/ml solvent. The solvent used in all experiments contained 5mM NaCl and 1uM FeCl<sub>2</sub>. A trace amount of iron was added because a previous study had demonstrated that this increases the susceptibility to weak EM fields (23). For each condition (14 control runs and 7 experimental runs), the stock solution was diluted 1/10 in this solvent and immersed in 80°C water for 3 minutes to partially denature (unwind) the two strands. The DNA was then gently transferred to a quartz

cuvette and immediately placed inside a UV-visible diode array spectrophotometer (Hewlett Packard 8451A) for measurement. DNA rewinding was measured by taking eight sequential absorption readings (260nm) every 10 seconds.

For the seven experimental runs, three Reconnective Healing practitioners practiced Reconnective healing as if a subject was present who needed healing. No specific intentions were held by any of the practitioners. For each trial, an aliquot was prepared from the stock solution and placed on a table for the practitioner to treat for 10 minutes. Then the sample was placed in boiling water and transferred to the spectrophotometer, all while the practitioner continued to “heal” the sample. They stopped after the measurements were completed. Using different aliquots of DNA from the stock solution, this procedure described above was repeated 2-3 times in a row for each practitioner generating a total of seven treated samples from the seven separate trials. All three practitioners were evaluated sequentially in one afternoon. Fourteen control experiments were done using different aliquots of the same stock solution of DNA by following the exact same procedure as described above, except that no healing intervention was presented. Control experiments were done sequentially on the morning of the same day as the treated samples.

As DNA spontaneously rewinds after heat treatment, its ability to absorb light decreases over time. Therefore, the rewinding curve shows a gradual decrease. The rewinding curves were analyzed quantitatively by measuring the initial slope (first 60 seconds only) of

each curve using the IBM Excel software (see Figure 1). Therefore, these measurements represent the initial rate of rewinding – the DNA's immediate response to heat shock.

All calculated slope values were multiplied by 1000. All slopes had a negative value reflecting the decrease in absorption over time. Individual slope values for experimental and control experiments were analyzed for statistical significance using a two-sample t-test (assuming equal variances).

## RESULTS

A typical rewinding control curve showing the gradual decrease in absorption (increase in rewinding) over time is presented in Figure 1. The irregular shaped line connecting the 10-second points is generated from the raw data in a typical control experiment. The solid straight line was generated by the Excel software as a 'best-fit' line through the data points. The software also gives a numerical value for the slope of this line which was recorded. The slope values for the 14 different control experiments are presented in Figure 2. The straight horizontal line across the entire figure represents the average value for the controls. The average slope for all control experiments was  $-0.43 \pm 0.087$ .

The exact same procedure was used to measure DNA rewinding in the presence of three different Reconnective Healing practitioners as described above. The average slope of the rewinding curve over all seven healing trials was  $-0.60 \pm 0.11$  (see Figure 3). Statistical analysis of all controls and all treatment slope values indicated a highly significant

increase in the slope (a more negative number) due to the presence of Reconnective Healing practitioners ( $p=0.004$ ). The average magnitude of this effect, when calculated with respect to untreated controls, was 36%.

Therefore, overall, the energetic treatments showed an increase (speeding up) in the rate of rewinding. In addition, there were significant differences from practitioner to practitioner and from session to session. The magnitude of these changes varied from 20% to 68%, measurements that were obtained in the second session of the first practitioner. This practitioner was unable to change the rewinding kinetics on their first session, suggesting the possibility of a learning curve. In contrast, the third practitioner had a significant effect on both trials. This practitioner, unlike the other two, kept a large distance of 3-6 feet between themselves and the DNA sample and even went behind the spectrophotometer on more than one occasion during the treatment. This practitioner performed most consistently, producing a marked stimulation of DNA rewinding on both trials. It is worth noting that the second practitioner was interrupted by a telephone call during two of her three trials. Since each Reconnective Healing session was an independent, we do not have the data required to attribute the variations to changes in the practitioner's healing abilities.

## DISCUSSION

The first study by the author demonstrated that healing arts practitioners can influence the conformation of DNA utilizing a static measurement assay which only took a

single spectrophotometric measurement before and five minutes after energetic treatments (14). In that experiment, DNA was partially denatured (unwound) using heat, so the DNA could either continue to unwind or it could rewind in response to an energetic intervention. The results indicated that the intention of the practitioner could influence the conformational states of DNA, since holding the intention to wind or unwind the DNA had the corresponding effect on the actual DNA. Therefore, it was concluded that conscious intentions either promote natural rewinding or promote unwinding.

The original procedure was subsequently modified to measure real-time, dynamic changes in the secondary structure of DNA during an energy healing treatment. This new dynamic assay was used in a second study by the author (15). The second study demonstrated that Reiki and QiGong healing arts practitioners decreased (slowed down) the rate of rewinding, compared to untreated controls, after partial denaturation (separation of the two strands). There are in fact biological processes that require slowing down in order to promote healing, the obvious example being the hyper-proliferative state of cancer cells. Nonetheless, slowing down rewinding seems counter-intuitive since healing energy would be expected to speed up rewinding as DNA returned to its natural helical shape. The factors previously considered relevant for slowing down rewinding are apparently no longer relevant for an intelligent healing energy such as that associated with Reconnective Healing.

Using the same dynamic DNA rewinding assay as in the author's second

study, the present study demonstrates that Reconnective Healing practitioners have a different effect on the rate of rewinding. Compared to untreated controls, all three Reconnective Healing practitioners increase (speed up) the rate compared to untreated controls, although to varying degrees. These results are supported by preliminary evidence from the second study by the author (15) where a healing arts practitioner, using the Original Wave technique, also increased the rate of DNA rewinding. Because a stimulatory effect on rewinding was seen with only one Original Wave practitioner, the observation was considered anomalous. Now that three additional practitioners, each using Reconnective Healing, also increase the rate of DNA rewinding, stimulatory effects on DNA must be considered when developing models to explain how consciousness can affect biomolecules.

Although these results appear to indicate opposite effects of different energetic healing arts approaches, we must bear in mind that control rates of rewinding vary from day to day. Therefore, we can only conclude that the rate of rewinding following treatment from healing arts practitioners is either faster or slower than the control on a given day. Nonetheless, numerous examples exist in the scientific literature indicating opposite or bipolar responses to external energetic or chemical influences.

One of the earliest references to the bipolar nature of bioenergy comes from ancient Chinese scriptures that describe positive and negative types of Qi energy. Experimental data now exist demonstrating that positive and negative Qi can be stored on opposite sides of a

2D inert carrier (24). Classical EM fields have been observed to have opposite or negating effects on cellular responses, depending on the frequency and intensity (25,26) as well as the polarity (27) of the incident radiation. Thus, certain frequencies stimulate a biological system, whereas other frequencies inhibit. In addition to EM fields, stimulatory or inhibitory biological responses have been reported for a variety of chemical (28) and electrical (29) signals. However, we must also consider that biological systems themselves are bipolar in nature and thus produce bipolar responses to various external stimuli. Thus, methylation of DNA can either increase or decrease its level of transcription, depending on whether the methylation inactivates a positive or negative regulatory element (30). Therefore, it is not presently clear whether bioenergy emitted from healing arts practitioners is bipolar or the DNA response is bipolar or both.

It is interesting to note that Reiki and QiGong practitioners slowed down DNA rewinding yet Reconnective Healing practitioners sped up or accelerated the rewinding process. The differential responses of different healing arts modalities on human DNA may also be due to the intrinsic nature of the respective bioenergy produced. Thus, Reiki practitioners tune into or access a specific set of cosmic healing energies associated with the Reiki tradition. They use special techniques that utilize Japanese kanji word symbols, sometimes mixed with Sanskrit, to facilitate resonance with cosmic Reiki healing energies. Once connected to these healing energies, they direct them into the patient. In contrast, Reconnective

Healing practitioners allow themselves to become a healing catalyst by accessing a universal field of healing energy, which includes Reiki and all known healing energies. They enter into a transcendent state of observation without judgment, intention or expectation and become one with the entire range of cosmic healing energies. Furthermore, Reconnective Healing practitioners access energies that require no direction as they inherently know the most appropriate and optimal treatment for the person and situation at hand. If the wide range of healing energies is considered in terms of frequencies, it is reasonable to propose that Reiki and QiGong practitioners tune into certain subsets of these frequencies, whereas Reconnective Healing practitioners access the comprehensive spectrum of healing frequencies.

Bioelectromagnetics researchers typically study one or two frequencies (a carrier and a modulation frequency) at a time. In some studies, two frequencies are more biologically active than a single frequency. For example, x-ray radiation and 30Hz EM fields by themselves have minimal cytogenetic effects, but in combination show a marked stimulation of chromosome aberrations (31). Furthermore, a technique called frequency-specific microcurrent treats medical conditions with electrical current modulated using pairs of frequencies rather than individual frequencies (3,32). Differential responses of biological systems to cell phones (as a source of multitude of frequencies) and signal generators (as a source of an individual cell phone frequency) have been reported in the literature. However, since no individual study (to the author's knowledge) has

compared single and multiple frequencies using the same experimental protocol, it is not possible to make a direct comparison.

Another reasonable hypothesis to explain why different healing modalities have different effects on DNA rewinding is based on the practitioner's intention, rather than on the intrinsic nature of the energy they are emitting. This hypothesis is supported by results from the first study by the author indicating that practitioners, using different healing techniques, could either increase or decrease DNA winding according to their intention (14). These results confirm other studies demonstrating the biological specificity of different intentions of healing arts practitioners (33). One such study demonstrated that the intention of a healer to increase cell growth resulted in an increased proliferation of E.Coli cells in-vitro, whereas the intention to slow down growth inhibited their proliferation relative to untreated controls (33). Reiki and QiGong practitioners held specific intentions to resonate with DNA and intentionally increase or decrease its winding dynamics. Reconnective Healing practitioners, however, focus more on being present, listening, receiving and observing without judgment, and less on the intended outcome. They do not specifically direct the DNA molecule or otherwise attempt to tell it what to do or how to do it. Instead, they allow the intelligence of the universal field to make the most appropriate determinations for the most optimal outcome.

Thus, although different types of healing modalities have differential effects on DNA rewinding in-vitro, it is not clear

whether these differences can be extrapolated to the clinical situation. It is likely, however, that under the same clinical situation, different healing modalities will yield different results that are consistent with the characteristics of the specific modality. It is known that healing arts practitioners do have clinically beneficial effects on the body (1). The differential response of DNA observed here could suggest different healing modalities may be more or less beneficial for effective treatment of biochemical or energetic imbalances. Some healing arts practitioners direct energy with specific intention at specific biological targets. However, when universal energies self-adjust to what is optimal for the individual, the need for healing energies to be directed at a specific biological target is no longer required.

### **Mechanism of Action**

In the search for a biochemical mechanism for energetic healing, various molecular pathways and molecular constituents of such biochemical pathways have been shown to be modified by healing arts practitioners (34). Cell growth (proliferation) is one of the most commonly studied biological processes. Although there are many biochemical pathways associated with cell proliferation, DNA synthesis is considered most fundamental. DNA synthesis is a complex sequence of individual biochemical steps resulting in DNA replication. One of the earliest events in this process is conformational changes in DNA. Therefore, the ability of healing arts practitioners to change DNA rewinding suggests that in-vitro conformational changes in DNA

represent a fundamental initial biochemical process that may initiate the healing response.

The use of conformational changes in bio-molecules to monitor the effects of healings arts practitioners was recently proposed by Strickland (18), who designed an experiment with Therapeutic Touch practitioners using conformational changes in proteins as a model system. Strickland (18) makes the point that protein folding is an energy-requiring system and should be sensitive to biofield energy. Support for a role for conformational states of DNA in healing follows from a previous experimental study demonstrating that conformational states of DNA are altered by EM fields (17). Thus, conformational changes in DNA or other biomolecules appears to offer a feasible “mechanism of action” behind healing energy treatments. Although the experimental data in the Strickland study did not reach statistical significance, there are methodological issues to consider. The inability to measure conformational changes in response to subtle healing energies is usually associated with non-optimal experimental conditions. It is known in the Bioelectromagnetics community that strong biological responses to EM fields typically occur during resonance conditions, which assumedly were not met in the Strickland study. It is interesting to note that in the Strickland protocol, several hours occur between the initial treatment and the actual measurement. In contrast, in the present study there is no time delay between treatment and measurements, since all measurements occurred in real-time as the practitioners were doing their treatment protocols.

This conclusion is also supported by a study with Qigong practitioners where changes in neutrophil were measured during 60 seconds of a healing treatment (35). Taken in conjunction with the present study, the results indicate that the body responds to the energy treatments over a very short time course – and future studies should take this into account when designing experimental protocols. This conclusion also raises questions about the long-term effects of healing energy. Bearing in mind the subtle and immediate nature of healing energy, clinical applications of such energetic treatments might be most appropriate as an energetic pre-treatment prior to a chemical (pharmaceutical or herbal) intervention. Again, bear in mind that the results of Reconnective Healing practitioners have a tendency to appear both fairly instantaneously and to be life-lasting.

In the search for a biophysical mechanism of action of healing energy, it has been previously proposed that EM fields mediate the effects of healing arts practitioners (6,36). Indeed, EM fields, of various frequencies, are known to be emitted from the hands of such practitioners (37). Furthermore, EM fields have been shown to alter the conformation (secondary structure) of DNA (17). It therefore seems reasonable to conclude that locally acting EM fields emitted by the hands of healing arts practitioners, at least in part, resonate with and produce changes in DNA. It is interesting to note that EM fields often slow down or inhibit physiological processes to a greater extent than they stimulate them (38).

Available experimental evidence for non-local effects of healers (39) and accessory prayer (40), however, does not



support the EM field theory of healing. Although the rapid decay of EM fields as they radiate from a source (i.e. the body) cannot explain reported distance healing effects, there are non-classical forms of EM fields that can propagate without losing energy (41) and can travel at supra-luminal velocities (42). It has also been pointed out that the biofield and the physical body contain and emit non-classical EM fields (43,44) and it has been proposed by the author that non-classical EM fields are involved with the natural healing process (5).

In addition to non-classical EM fields, the emerging field of Quantum Biology indicates that quantum processes can occur in the human body at physiological temperatures. Quantum fields associated with these processes might also offer a physical mechanism for energetic healing. Of particular interest here are recent studies demonstrating that quantum tunneling (45) and quantum entanglement (46) occur between base pairs in DNA. Thus, it appears that these quantum forces are having a macroscopic effect on DNA by helping hold together and stabilizing the macromolecule. When base pairs oppose each other on adjacent DNA strands, a hydrogen bond is formed (in addition to the well-known electrostatic bond) between the two bases. Hydrogen bond formation, in general, is associated with increased structural stability of proteins and nucleic acids (47). Therefore, the ability of Reconnective Healing practitioners to increase rewinding of DNA means more hydrogen bonds are formed and more quantum fields are generated. The ability to induce quantum processes is the essence of a new theory involving quantum control of molecular process

(48). This new field is based on probabilistic quantum mechanics and states that any system (including macromolecules such as DNA) can be characterized by its wave function. Furthermore, several practical applications of the theory have been used to “manipulate” the dynamic outcomes in simple molecular systems by inducing quantum coherence within the system. For example, by changing the optical parameters of an incident laser, the amounts and ratios of L and R enantiomers can be altered in a racemic mixture (49).

The postulated role of non-classical and/or quantum energy fields in the natural healing process is consistent with the tenets of Reconnection Healing. It appears that the universal energies that they access are a comprehensive spectrum of healing frequencies best described as a higher aspect of light and information beyond their conventional definitions. These higher order properties of healing energy therefore account for the instantaneous and lifelong effects often observed following treatment with a Reconnective Healing practitioner. Contemporary definitions of quantum information (50) and non-classical light (51) appear to be consistent with the idea that these energies are involved with communication and healing mediated by the biofield (2,44).

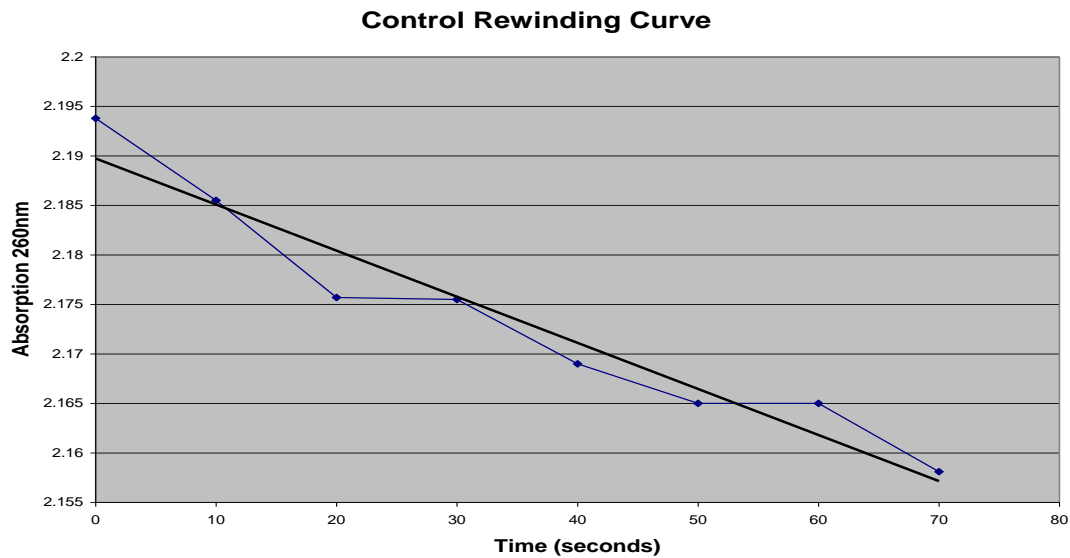
Whatever the mechanism of action turns out to be, the results of the present study support Strickland’s hypothesis that conformational changes in biomolecules can be used as a simple bio-assay to monitor the effects of healing arts practitioners. Further studies will be required to determine whether this

method is reproducible, operator independent and universal.

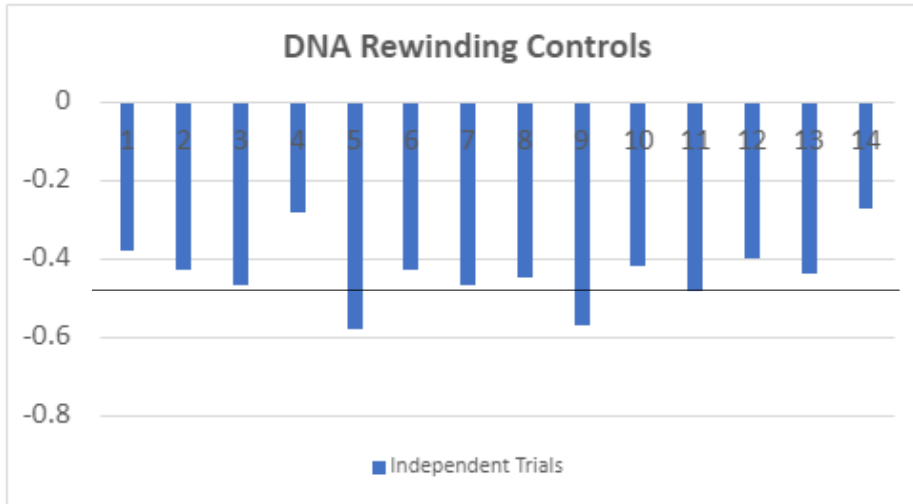
### CONCLUSIONS

This study demonstrates Reconnection Healing Arts practitioners speed up the rewinding of partially denatured, double stranded human DNA in a test tube. Previous studies with other healers consistently showed a slowing down of the rewinding process (15). Even older studies demonstrated that the intention of the healer could increase or decrease winding of intact helical DNA (14). These results indicate that the intention and/or the energy generated by different healers can have opposite effects on a key bio-molecule, DNA. This suggests that, at least with respect to DNA, there are two types of healers – stimulatory and inhibitory. It will be important to verify this bi-phasic response for other biomolecules or

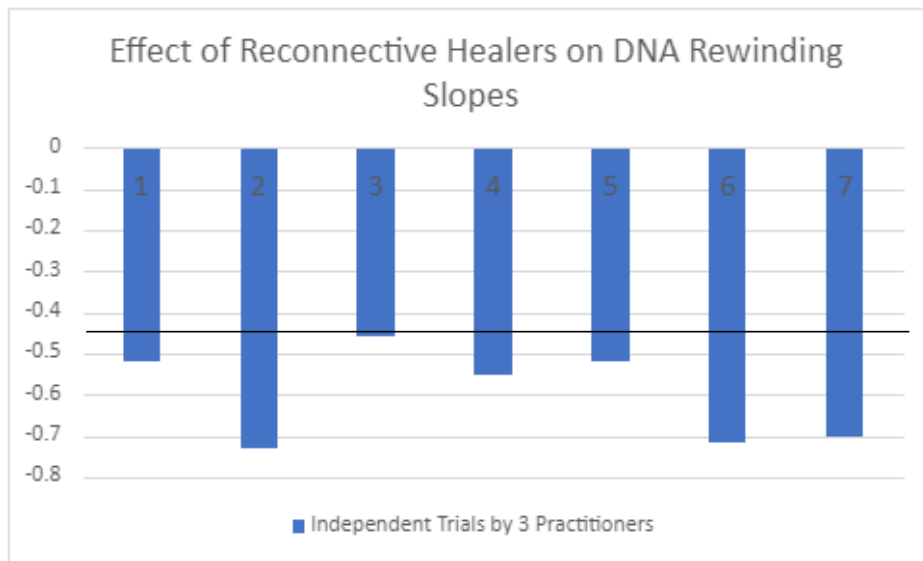
other biochemical processes because if it can be generalized to other parts of the healing process, it is a very important observation. It implies that a person seeking a healer may need a stimulatory healer or an inhibitory type of healer, depending on the type or stage of their illness. Furthermore, they may require one type initially, but at a later stage might require the other type. If this hypothesis is true, it will behoove us to characterize different healers to know which type they are. However, even if that information can be offered to individuals seeking the help of a healer, it is not obvious how such an individual will know which type of healer they need at a given point in time.



**Figure 1:** Control curve for DNA spontaneous rewinding after partial heat denaturation.



**Figure 2:** Rewinding slopes for 14 independent sequential controls runs. Horizontal line represents the average control slope



**Figure 3:** DNA rewinding slopes during treatment sessions by three Reconnective Healing practitioners. The first and third practitioners were tested twice (first 2 bars and last 2 bars), whereas the second practitioner was tested three times. The control slope is -0.43

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**CONFLICT OF INTEREST** – none

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