

LOCAL AND NON-LOCAL EFFECTS OF COHERENT HEART FREQUENCIES ON CONFORMATIONAL CHANGES OF DNA

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INTRODUCTION

Recent studies have demonstrated the presence of quantum coherence in biological systems (1) and one of us (GR) has demonstrated that quantum fields can influence neurological (2) and immunological functions (3) at the cellular level. These studies support the existence of an endogenous electromagnetic field within the body which is coherent in nature. This hypothesis is also supported by two recent findings from the Institute of HeartMath (4). These studies demonstrated a) coherence in the ECG frequency spectra of individuals focusing on generating deep feelings of love, care or appreciation and b) a correlation between the ECG coherent patterns and electrical activity in the brain (5,6). These results support the idea that the heart acts as a master electrical oscillator radiating coherent frequencies throughout the body which promote health and vitality (7,8). Although the heart is known to emit an electromagnetic field, we believe that the energetic exchange of information between the heart and the rest of the body is mediated by a non-Hertzian quantum field which we refer to as heart energy.

The theory also proposes that physiological benefits of coherent heart frequencies are mediated through DNA. The theory is supported by Popp's demonstration that DNA emits quantum coherent photons (9) and that DNA spontaneously oscillates coherently (10). We have presented some preliminary evidence (11) which demonstrated that the conformation of DNA can be altered by individuals producing coherence in the ECG frequency spectra.

MATERIALS AND METHODS

A continuous state of deeply focused love was generated by Doc Lew Childre and by ten other members of the Institute of HeartMath capable of mental and emotional self-management. In addition several gifted healers and five university student volunteers were also asked to focus on feeling love. ECG measurements were taken and analyzed by fast fourier transform (FFT) techniques. The coherence ratio was determined by the percent of coherent to noncoherent epics during the entire two minutes of recording (4). DNA samples were given to all individuals approximately one minute after physiological recordings had begun. The subjects held a beaker with a test tube containing DNA inside for the next two minutes during which time ECG recordings were continued. Long distance studies were conducted at 0.5 miles away from the test area. Controls consisted of periods where no energy was sent. In addition, active broadcasting periods (1 minute) were unknown to the experimenter. For the remaining experiments control samples of DNA were left on the laboratory bench for varying amounts of time when no energy was being sent. In this case UV spectral curves were superimposable.

The DNA samples consisted of identical aliquots (labeled in a double blind fashion) of human placental DNA suspended in deionized water. At the beginning of certain experiments, DNA samples were heated (80° C for 2 minutes) to partially denature (unwind) the DNA. All samples were stored at 4° C in a separate building before and after each experimental run. For each sample, the conformation of DNA was measured before and after exposure to the subject's intention using a Hewlett Packard UV absorption spectrophotometer.

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RESULTS AND DISCUSSION

Individuals trained in generating feelings of deep love and appreciation showed high coherence ratios in their ECG frequency spectra (Figure 1) and all were able to intentionally cause a change in the conformation of the DNA. The amount of winding and unwinding of the two strands of the DNA helix can be directly measured by the height (amplitude) of the absorption peak at 260 nm using a UV spectrophotometer. The results indicate that the DNA conformation was affected differently according to the specific intention. For example, intentions to unwind the DNA caused a characteristic increase in the amplitude of the absorbance peak at 260 nm (Figure 1).

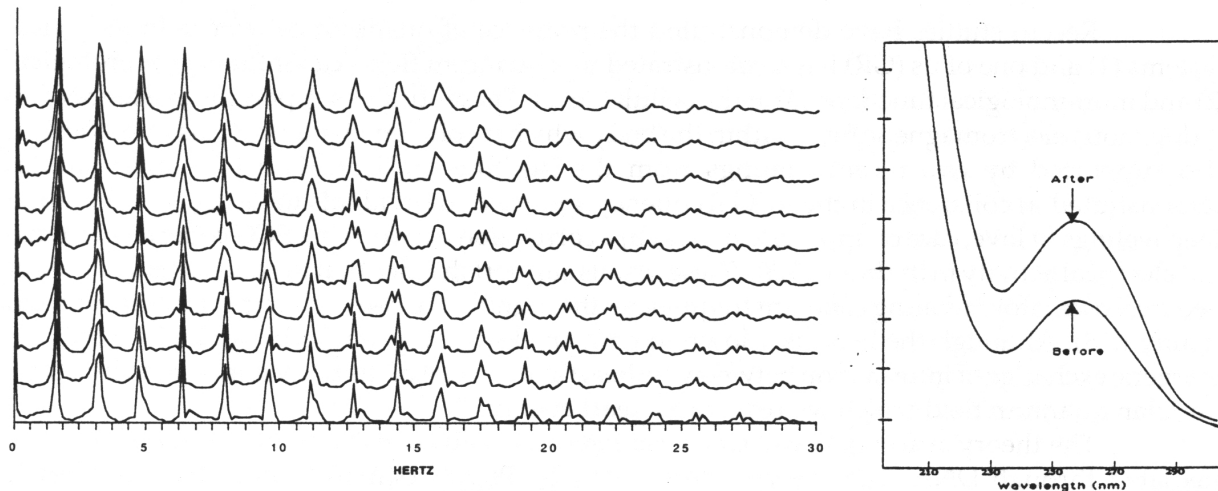


Figure 1. In the ECG spectra on the left, all the epochs are coherent. The change in the denaturation of the DNA (right) was three-times larger than could be produced by thermal and mechanical perturbation in the lab, suggesting physical/chemical alterations in the DNA bases.

The UV spectra in Figure 1 indicate a very large increase in absorption (denaturation) of DNA after being exposed to an individual generating a particularly high ECG coherence ratio which was sustained throughout the 2-minute exposure period. These changes were 3-fold larger than those produced by maximal thermal and/or mechanical perturbation, well known to denature DNA. The effects observed here go well beyond simply causing the DNA to completely separate. One possible explanation is that a physical/chemical alteration in the actual structure of the individual DNA bases (which make up a strand) occurred. Such changes could result in an increased absorption of UV by the DNA, causing an additional increase in the absorption peak (260 nm).

The results in Figure 2 indicate that individuals generating a relatively high ECG coherence ratio could also cause a decrease in the absorption peak (260 nm) of DNA. In this case, the subject's intention was to rewind the DNA back to its intact helical conformation. Previous experiments indicated that different states of consciousness produce different effects on DNA, but states which generate the highest coherence ratios produce the most marked effects on DNA (11). The dependence of the DNA conformation on the state of consciousness was also demonstrated using individuals who were not trained in generating deep states of love. These individuals showed characteristically low ECG coherence ratios and were unable to intentionally influence the DNA. In this case the before and after DNA spectra were superimposed and indistinguishable.

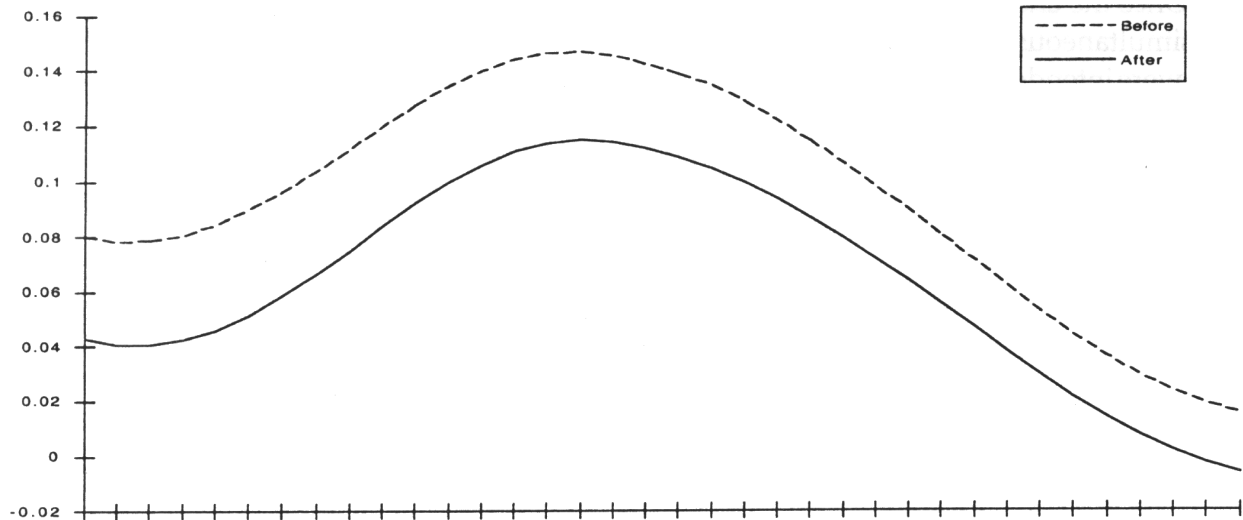


Figure 2. UV spectra of DNA showing a decreased absorption peak, which corresponds to rewinding of DNA.

One individual studied was upset and frustrated, and had little control over his emotions. This individual showed an unusually low ECG coherence ratio. However because of the strong intensity of his emotional experience, his energy caused a change in the conformation of DNA. The spectra in Figure 3 demonstrate the unusual effect of frustration on DNA. The results indicate an increased winding of the DNA and a shift in the absorption peak. This is an unusual effect which indicates that in addition to changing the conformation of DNA, an alteration in the physical/chemical structure of one or more of the bases in the DNA molecule has occurred. Although the incoherent energy associated with frustration resulted in a change in DNA, this individual could not intentionally bring about this change.

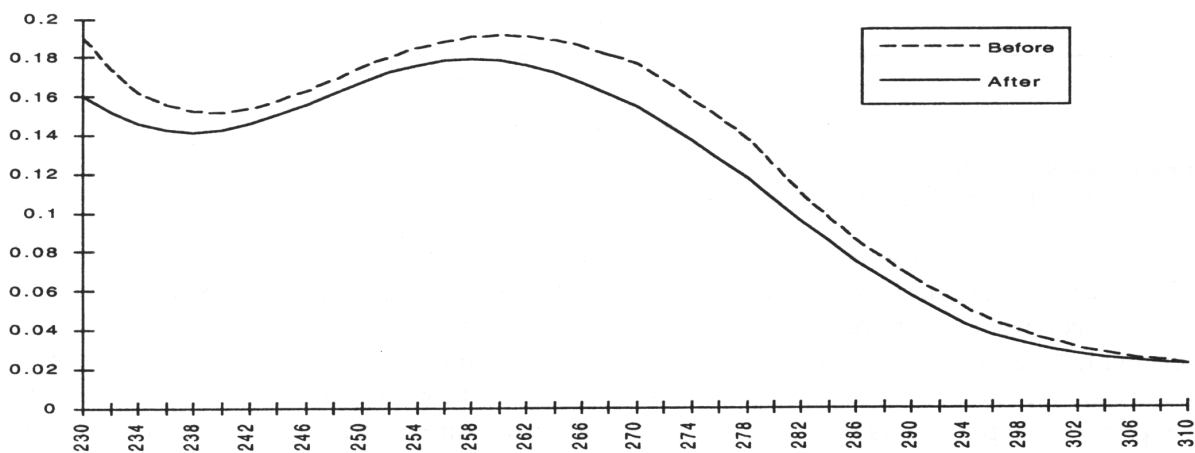


Figure 3. Unusual shift in the absorption spectra of DNA after being exposed to high-intensity frustration.

Since different intentions produced different effects on the DNA conformation, it was of interest to see whether a specific intention could be directed toward a specific DNA sample. Three identical aliquots of DNA were held by an individual, generating sustained coherent heart frequencies, who intended to denature two samples to different degrees and not to influence the third sample at all. Once the energy allotment was assigned to each sample of DNA, the different

intentions were simultaneously “broadcast.” The results in Figure 4 indicate that the two DNA samples which were intended to change showed increased absorption peaks to different degrees, while the third sample showed no change in absorption compared to an untreated control sample. The ability to focus and direct a specific intention to different DNA samples indicates that the coherent energy field associated with the state of deep love can be modulated with specific frequency information associated with specific intentions. These results further indicate that the energy field is not an uncontrollable amorphous field. These results confirm previous research by one of us (GR) which indicated individuals generating coherent heart frequencies could intentionally modulate the growth of tumor cells resulting in either an increase or decrease in their ability to synthesize DNA (12). These results also indicate the physiological relevance of the conformational changes in DNA observed in these studies. Denaturation of DNA is one of the earliest changes which occur prior to cell division.

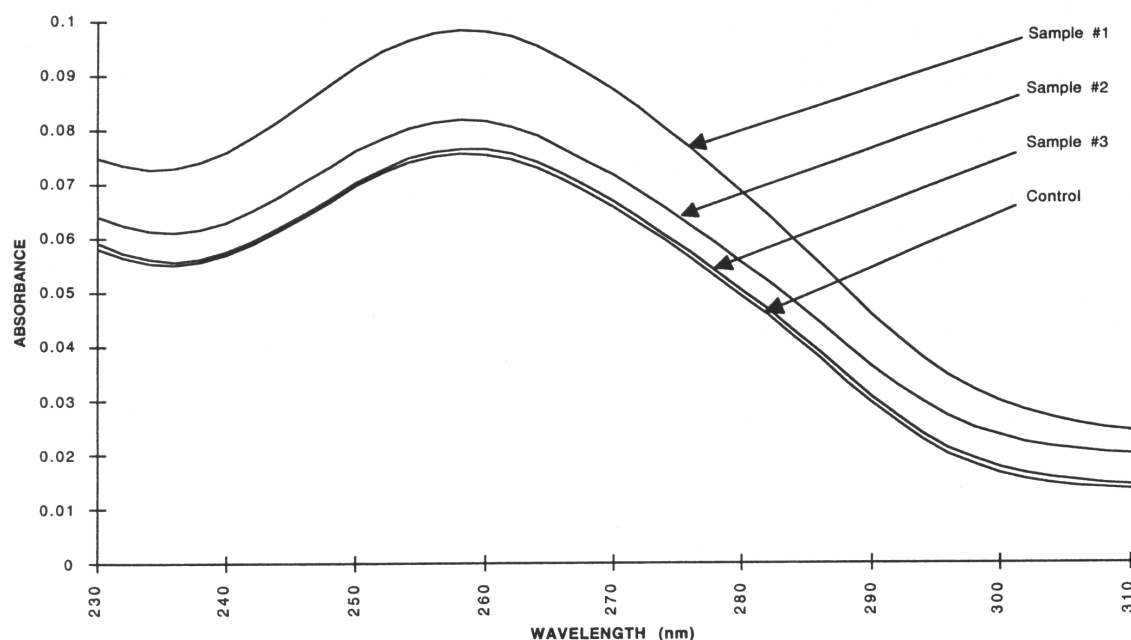


Figure 4. Three DNA samples were held at the same time with the intention of simultaneously causing different effects in two samples, while leaving the third sample unchanged.

It was also of interest to determine whether coherent heart energy can influence DNA at a distance. The data in Figure 5 are the results on one such experiment, where the individual generating coherent heart energy was approximately 0.5 miles from the DNA sample. In this experiment, the intention was to increase DNA winding. In other experiments the intention to unwind the DNA caused an increase in the absorption peak at 260 nm (data not shown). In contrast to the previous experiments in which the DNA conformation was measured immediately after being exposed to heart energy, these experiments examined the time course of the effects. The results are complex and depend on the energies involved. The general conclusions from these series of experiments indicate that different individuals and different intentions produce characteristic changes in the time course. Thus, in some experiments effects were seen immediately after sending energy, whereas in other experiments effects were seen only after a given period of time.

This time period varied from 10 minutes to 60 minutes, depending on the energy being sent. Furthermore, once the effect was manifest, it either continued to increase or reached a plateau, depending on the experiment.

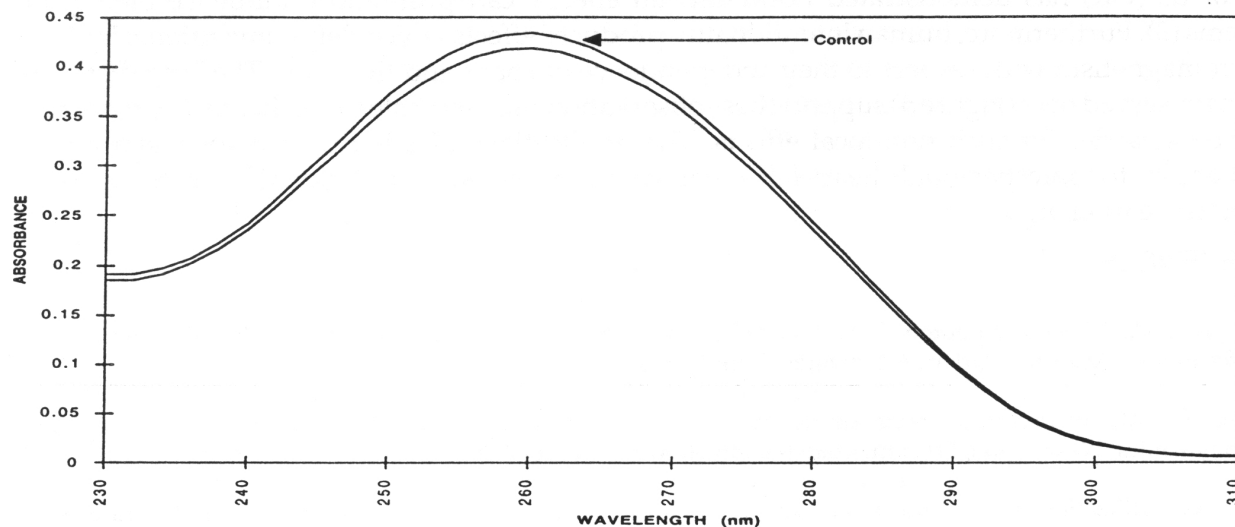


Figure 5. The long-distance effect of coherent heart energy modulated with the intention to increase the winding of DNA. Measurements were taken 90 minutes after initial exposure to heart energy.

CONCLUSION

The results extend our initial observation that coherent heart energy generated during the loving state can alter the conformation of DNA in solution (11). This study was the first to correlate electrophysiological measures of ECG with biological changes occurring outside of the body. We have also observed a correlation between coherent heart energy and the humoral immune system by measuring changes in salivary IgA (13). Thus coherent heart energy can produce biological effects both inside and outside of the body.

All individuals capable of generating high ECG coherence ratios could alter the conformation of DNA according to their intention. Intending to unwind or wind the DNA produced increases or decreases in the UV absorption peak at 260 nm. Untrained individuals, who were not able to sustain feelings of love, showed low ratios of ECG coherence and were unable to intentionally alter the conformation of DNA.

The conformational states of DNA are important in DNA replication and repair in addition to transcription, a process which results in generation of proteins and enzymes which regulate a wide variety of basic cell functions. The results of this study indicate that the heart's energy field can directly modulate these basic cell functions (via a direct action on DNA). Such an information transfer from the heart's energy field to the DNA and therefore to all cells in the body has not been previously described. This energy transfer is distinctly different from the known electrical and chemical communication from the heart to the brain. The implications for such an energy transfer system within the body are as profound as those arising from psychoneuroimmunology, which only considers the link between the brain/mind and the immune system. Since heart energy can also communicate with the brain, it is likely that heart energy can also modulate and direct mind/body interactions. We have coined the term *cardioneuroimmunology* to describe such interactions.

The results in this study also reveal some previously unknown properties of heart energy. Bioenergy has been traditionally considered to be electromagnetic in nature (14), since endogenous and exogenous EM fields can produce a variety of physiological effects associated with healing. The unusual ability of heart energy to carry three different frequency patterns associated with different intentions (Figure 4) suggests a non-electromagnetic information carrier. Indeed one of us (GR) has demonstrated non-Hertzian energy can profoundly influence biological systems (3). Furthermore, human intentionality produces effects which defy conventional laws of electromagnetism with respect to their independence of space and time (15). The long distance effects observed here (Figure 5) support these observations and indicate that coherent heart energy may be a carrier for such non local effects. The implications of this research suggest a novel mechanism for interpersonal, heart-felt communication between individuals which involves coherent heart energy.

REFERENCES

- (1) Popp, F. A. Coherent photon storage in biological systems. In: F. A. Popp, *et al.*, eds., *Electromagnetic Bioinformation*. Munich: Urban & Schwarzenberg (1989).
- (2) Rein, G. Modulation of neurotransmitter function by quantum fields. In K. H. Pribram, ed., *Behavioral Neurodynamics*. Washington, D.C.: Internat. Neural Network Society (1993).
- (3) Rein, G. Utilization of a cell culture bioassay for measuring quantum fields generated from a modified caduceus coil. Boston: *Proc. 26th Intersoc. Energy Convers. Engineer. Conf.* (1991).
- (4) McCraty, R., M. Atkinson and G. Rein. ECG Spectra: The measurement of coherent and incoherent frequencies and their relationship to mental and emotional states. *Proc. 3rd Annual Conf. of the Internat. Soc. Study Subtle Energies & Energy Medicine*, Monterey, CA. (1993).
- (5) McCraty, R. and M. Atkinson. Correlations between ECG and EEG recordings from individuals in a loving state of consciousness. (In preparation).
- (6) Wilson, E. Studies of hands on healing and their corollaries. *Proc. 3rd Annual Conf. of the Internat. Soc. Study Subtle Energies & Energy Medicine*, Monterey, CA. (1993).
- (7) Childre, D. L. *Self Empowerment: The Heart Approach to Stress Management*. Boulder Creek, CA: Planetary Publications (1992).
- (8) Paddison, S. *The Hidden Power of the Heart*. Boulder Creek, CA: Planetary Publications (1992).
- (9) Rattemeyer, M., F. A. Popp and W. Nagl. Evidence of photon emission from DNA in living systems. *Naturwissenschaften* 68 (1981): 572.
- (10) Garyaev, P. P., K. V. Grigoriev and V. P. Poponin. DNA solutions studied by Laser Correlation Spectroscopy: Experimental evidence for spontaneous temporal self-organization. *Bull. Lebedev Physics Instit.* 12 (1992): In press.
- (11) Rein, G. and R. McCraty. Modulation of DNA by coherent heart frequencies. *Proc. 3rd Annual Conf. of the Internat. Soc. Study Subtle Energies & Energy Medicine*, Monterey, CA. (1993).
- (12) Rein, G. *Quantum Biology: Healing with Subtle Energy*. Boulder Creek, CA: Planetary Publications. (1992).
- (13) Rein, G. and R. McCraty. Effect of positive and negative emotions on salivary IgA. (In preparation).
- (14) Becker, R. O. and G. Seldon. *The Body Electric*. New York: W. Morrow & Co. (1985).
- (15) Dunne, B. J. and R. G. Jahn. Experiments in remote human/machine interactions. *J. Scientific Explorat.* 6 (1992): 311.