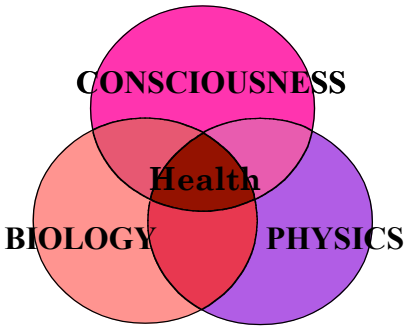

President
Maria Syldona, Ph.D.

Quantum Biology Research
670 Carll's Path
Deer Park, N.Y. 11729

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Cell Phone Radiation Induced Changes in Human DNA are Attenuated by the Aulterra Neutralizer

Introduction

Electromagnetic fields (EMF) in the form of x-rays, ultraviolet and microwaves are known to damage the body. Other portions of the EM spectrum, including radiofrequency waves emitted from cell phones (CP), computers and TV's are also harmful to the body. Government funded research by the Bioelectromagnetics community has now focused on the health hazards of CP due to their endemic use. Of the large number of studies, measured biological effects of actual, broad-spectrum CP radiation (not isolated or simulated components) only some show detrimental effects. As previously observed by the Bioelectromagnetic community with video display monitors, biological effects of such radiation are only observed when resonance conditions are met. It is now well established that many confounding variables, e.g.: the strength and orientation of the geomagnetic field, can create experimental conditions where biological effects are not observed (Ulmer, 2002). Thus, studies which failed to measure biological effects from CP radiation have simply not obtained the necessary resonance conditions required to observe the effect. It is tempting for CP manufacturers to focus on studies showing no effects and conclude CP radiation is safe despite the fact that in real-life, CP users are exposed to this radiation numerous times during the course of a day and over the course of several years. Most scientific studies do not take into account the chronic use of CP.

In some cases the bio-molecular sensors which resonate with the harmful radiation is known. Unfortunately, the most fundamental molecule in the body, DNA itself, can act as a target for such radiation even when it is non-ionizing and low-level (Blank, 1999). A recent study concluded that radio-frequency EMF from CP, at intensities similar to those emitted from contemporary CP, directly damage DNA (Mashevich, 2003). This is the same type of damage previously shown for UV and x-rays. Previous research with other types of EMF, not necessarily emitted by CP, indicated shape (conformation) changes in DNA (Semin, 1995). Either strand breaks or conformational changes in DNA can result in the formation of damaged proteins in the body.

There is clearly a need for technology to block or neutralize CP radiation. Since the radiation emitted from CP is so strong, inert materials which can absorb the radiation to significantly reduce the body's exposure are not readily available. The alternative approach is to use materials which radiate EMF of their own to neutralize the CP radiation. There are several examples in the scientific literature where one type of radiation will neutralize another (see

discussion). The Aulterra powder is an example of such a material which, because of its paramagnetic properties, radiates an EMF (Rein, 2000) which neutralizes the damaging effects of CP radiation on DNA (Syldona, 2001).

The purpose of this study was to replicate the results of a previous study with the Aulterra Neutralizer (Syldona, 2001) since the previous study used an older CP technology no longer in use and was done with a CP in the stand-by mode. The present study used a CP popular around 2002 which was tested in the receiving mode. In addition, at least twice as many experiments were done in the present study to further validate the protective effect of the Aulterra Neutralizer.

Experimental Methods

A highly sensitive bioassay has been developed by the QBRL to quantifying EMF effects by measuring conformational changes in human DNA (Rein, 2003). The procedure involves measuring the rewinding of DNA after heat shock which is well known to unwind the two strands that make up the DNA double-helix. After heating, the DNA rewinds back to its original intact conformation (Marmur, 1961). The rewinding process can be monitored by measuring the absorption of light as the DNA cools (Thomas, 1995).

The same three experimental conditions were used in the present study as in the original study. Control experiments were done first in the presence of ambient EM fields, but in the absence of any man-made EM fields. Then DNA rewinding was measured in the presence of the cell phone. In the third experimental condition, DNA rewinding was measured using the same cell phone containing an Aulterra Neutralizer placed inside the handle. Two weeks were allowed in between the second and third experiments to minimize any possible carry over due to EM condition of the laboratory environment (Tiller, 2004).

DNA Rewinding Assay

The same experimental protocol was used as in the previous study, except here the DNA was diluted in de-ionized water rather than a salt solution containing FeCl. Iron was included in the original experiment because a recent study demonstrated DNA was more sensitive to UV damage in the presence of trace amounts of iron (Audic, 1993). Since it is possible that the ferromagnetic iron might interfere with the paramagnetic material inside the Aulterra Neutralizer, it was left out in these experiments. Furthermore, it was decided to confirm the efficacy of the Neutralizer by putting DNA into a different aqueous environment. Therefore the NaCl was also left out in these experiments.

The specific experimental protocol that was followed involved making a stock solution (0.4mg/ml) of human placental DNA (Sigma Chemical Co., St. Louis) in de-ionized water. The stock solution was diluted to 0.03mg/ml in de-ionized water and heat shocked (80^0C for 4 minutes). Immediately after heat treatment the DNA was gently transferred to a quartz cuvette and then placed in the cuvette holder inside the spectrophotometer. For EM field exposure, a mobile Audiovox cell phone (in operation-mode while plugged in) was placed face up on top of the cuvette inside the spectrophotometer. The exact procedure was repeated using the same cell phone containing the Neutralizer. The CP was placed on the cuvette immediately after heat treatment and remained there for the duration of the experiment.

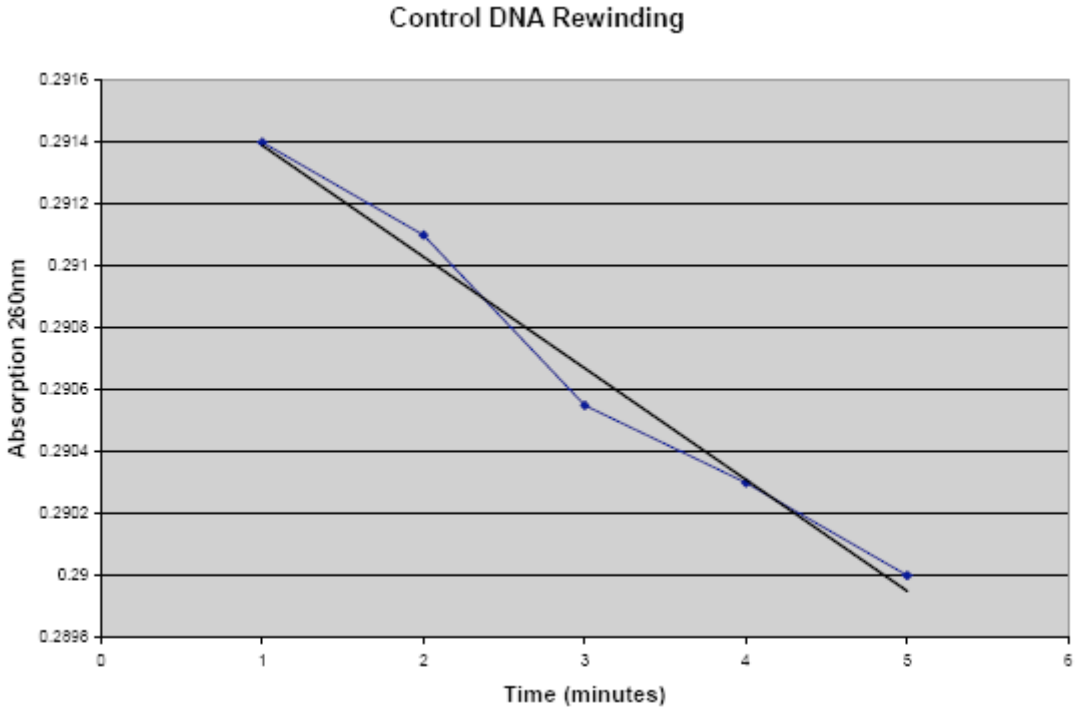
For all experiments, DNA rewinding was measured immediately after the CP was placed on the cuvette. Absorption of light at 260nm was measured using a UV-visible diode array spectrophotometer (Hewlett Packard 8451A) every 10 seconds over a fifteen minute time

period. As the DNA rewinds, it's ability to absorb light decreases over time. Therefore the calculated slope values are negative. Initial slope values over the first few minutes were calculated using the IBM Excel software for each separate experiment and then compared statistically using a two sample t-test (assuming equal variance). For statistical analyses (t-tests) were conducted using a total of 12 control experiments, 14 CP experiments and 22 neutralized CP experiments.

Results

Figure 1 shows a typical rewinding curve over the first few minutes. The initial slope over the first few minutes is classically used by biochemists in studying kinetics of biochemical reactions. The light grey irregular line is a plot of the raw absorption data collected by the spectrophotometer. The solid black line is the computer generated best-fit calculation of the slope.

Figure 1



Electromagnetic Fields from Cell Phones Effect DNA Recovery

The results presented below in Table 1 indicate the effect of CP radiation on DNA rewinding after heat shock. In the absence of CP radiation (control experiments), the average slope over all 12 experiments was -0.41 ± 0.065. In the presence of EM fields from the CP, the slope had an average value of -0.559 ± 0.056 over all 14 experiments. A more negative value for the slope reflects a faster rewinding rate following heat shock. These results indicate that the EM field from the CP produced a 40% increase in the rewinding rate. This effect of the CP radiation is highly statistically significant compared to the untreated control ($p<0.0001$).

Table 1

	Average Slope	SD	% Change	n	p (vs control)
Control	-0.41	0.065		12	
Cell Phone (CP)	-0.559	0.056	+40	14	<0.0001
CP +Neutralizer	-0.43	0.115	+5	22	NS
CP+Neutralizer (< cont)	-0.30	0.069	-32	7	<0.005

Neutralization of the Cell Phone with the Neutralizer

The results in Table 1 indicate that the CP containing the Neutralizer produced an average slope of - 0.43 ± 0.11 for all 22 experiments. This average value is not significantly different than the control value (-0.41) indicating that the harmful effect of the EM field from the CP is completely neutralized by the presence of the Neutralizer. It is interesting to note that in some experiments the rewinding slope values were even less than the control values.

Discussion

The results of this study indicate that CP radiation speeds up rewinding of DNA after heat shock. In the previous study, CP radiation slowed down DNA rewinding (Syldona, 2001). These opposite effects could be due to the fact that different types of cell phones (new vs. old technology) were used in the two studies and they were used in different modes (stand-by mode vs. operating mode). A CP in operating mode will generate a stronger EMF. Other scientific studies have observed that the direction of a biological effect is dependent on the intensity of the applied MF with opposite effects at high and low doses (Prato, 2000; Kujawa, 2004).

The sensitivity of DNA to EMF is also dependent on its ionic environment (Sukhoviia, 1980). In the previous study DNA was surrounded by sodium and iron ions which are known to bind to DNA (Deng, 1996) and influence its helical structure (Kuznetsov, 1997). Iron is ferromagnetic and influences the susceptibility of DNA to EMF (Audic, 1993). Furthermore, the iron and possibly even the sodium ions themselves could absorb EM radiation and complicate the interpretation of the results, since these ions are known to mediate biological effects of EM fields (Balcavage, 1996). The interaction of different ions with DNA and the CP radiation is complex and could account for the opposite effects observed in the two studies.

The results of the present study confirm those of the previous study thereby demonstrating that CP induced changes in DNA are completely reversed when an Aulterra Neutralizer is added to the CP. In the present study the CP effect on DNA was twice as strong as before (40% vs. 22%) and the Neutralizer still showed 100% protection. In some experiments not only did the elevated slope values return to normal, but they went below control values. This indicates that in approximately one-fifth of the experiments, the neutralized CP radiation actually slowed down DNA rewinding. Recent experiments with Reiki healing practitioners have demonstrated that their energy also slows down DNA rewinding (Rein, 2003). It is therefore predicted that when these resonance conditions are met, the neutralized CP radiation could actually have a beneficial effect on the body. However, since this effect only occurs 20% of the time, it is not clear whether over long term exposure to CP radiation a clinically relevant beneficial effect will actually occur.

It was previously observed that the EMF generated from the Aulterra powder induces an oscillatory winding and unwinding behavior in DNA (Rein, 2000). Since rewinding of DNA strands involves the formation of hydrogen bonds, which exhibit quantum properties, it was proposed that the Aulterra powder radiates a quantum field which is highly coherent (laser-like). This observation was offered as a feasible mechanism to explain how the Aulterra Neutralizer could cancel the detrimental effects of CP radiation, since it is known that adding coherent information to a classical EMF modifies its ability to influence biological systems (Litovitz, 1994).

A more thorough examination of the scientific literature indicates that other mechanisms are also likely to explain the results of the present study. These studies do not require that the EMF radiating from the Aulterra powder be coherent, but rather indicate that even classical EMF emissions can produce the same neutralizing effects. Paramagnetic substances like the Aulterra powder can both generate magnetic fields (due to the presence of unpaired electrons) and can absorb magnetic fields (a property called magnetic susceptibility). Thus, it is likely that the Aulterra powder also generates a classical EMF which can couple to and neutralizes the EMF from the CP. Although classical EMF theory does not predict two interacting EMF can influence each other, scientific evidence indicates that the biological activity of one EMF can be altered in the presence of a second EMF. For example, Comorosan first observed an interaction between two perpendicular high-frequency EMF in air which annihilated the effect of the primary EMF on the crystalline lattice structure of an enzyme substrate (Comorosan, 1980). More recent experiments combine low frequency EMF with static magnetic fields. These experiments indicate a complex interaction between the two fields where the biological activity of the low frequency EMF can either be enhanced (Jenrow, 1996) or reduced (Blackman et al, 1995) depending on the orientation and the amplitude of the two fields. In some orientations and amplitudes no modulation of the biological activity is observed. Therefore, interaction between the two fields only occurs under certain resonance conditions. In the present study there is also a complex interaction between the EMF radiating from the CP, the energy radiating from the Neutralizer and the geomagnetic field. Although resonance reported by Jenrow (1996) and Blackman (1995) only occurs under certain correct conditions, in the present study the CP radiation was still completely neutralized by the energy radiating from the Neutralizer. In contrast to Jenrow's experiments (1996), under no conditions were the biological effects of the CP radiation enhanced (slope values greater than 0.56).

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