

MRET-Shield Synopsis of Scientific Research

Updated on June 1, 2007

MRET-Shield “material and devices made, when placed in proximity to persons, animals and plants serve to lessen adverse health effects caused by electromagnetic radiation exposure. The material is responsive to magnetic field and emitting natural electromagnetic oscillations which are beneficial to humans, animals and plants, and off-set harmful aspects of EMR.”

US Patent No. 6,369,399 B1 “Electromagnetic Radiation Shielding Material and Device,” author Igor Smirnov, Ph.D., 2002

The MRET-Shield device was certified by UL in USA, 2002.

SAR (Specific Absorption Rate) Evaluation

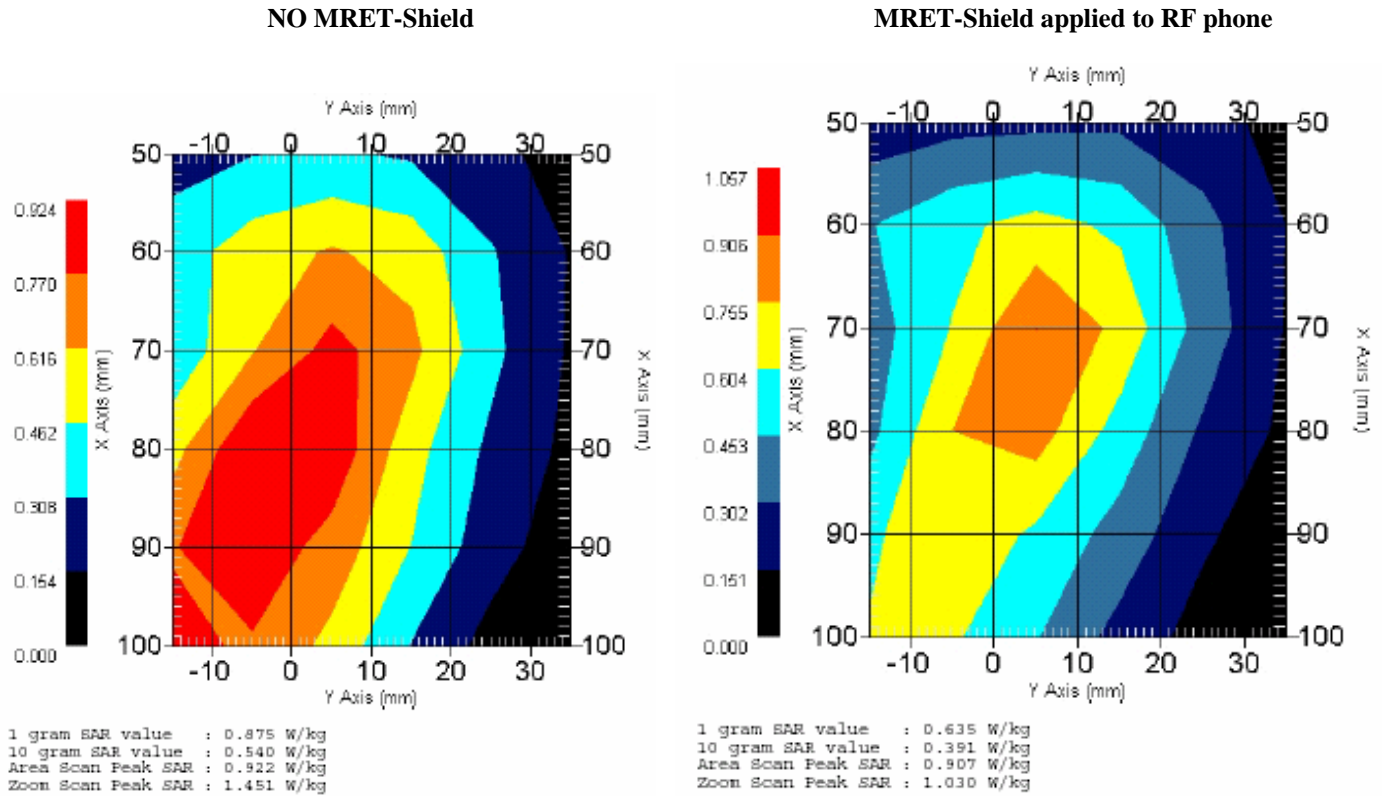
The SAR evaluation was conducted at RF Exposure Lab, Escondido, USA on two models of the RF (radio frequency) mobile phones with functioning frequency 836 MHz and three models with functioning frequency 1880 MHz. In compliance with SAR testing methodology the experiments were conducted on “phantom head” filled with water based jelly simulating living tissue.

Specific Absorption Rate (SAR) characterizes the level of absorption of EMR by the tissue of the body. The absorption of EMR by biological systems can lead to the distortion of cellular transduction mechanism, to the development of thermal effect in cells, their damage and, consequently, to the distortion of cellular function. Due to these reasons FCC (Federal Communication Committee) established the standards for allowed SAR values in the range of 0.2 – 2.0 W/kg. The reduction of SAR values obviously is beneficial for human health. The test evaluation revealed the two key results:

- The application of MRET-Shield to the RF phones does not lead to any significant distortion of transmitted RF signals.
- In each experiment SAR values were measured in 242 points of “phantom head.” The application of MRET-Shield to the RF phones showed that “Hot Spots” remained in the same location as without MRET polymer and their amplitudes decreased in 90% of data points. The application of MRET-Shield to the RF phones led to the reduction of the majority of meaningful SAR values in these experiments in the range of 0.3% - 29.0%.

Below are presented the “Hot Spot” Area Scan Diagrams that provide evidence that the application of MRET-Shield to the RF phone did not change the location of “Hot Spot” and significantly decreased SAR values in the scanned area.

“Hot Spot” Area Scan Diagrams



Phone Model: LG VX6000; Frequency: 1900.00 MHz; Max. Transmitted Power: 0.256 W; Phantom data: APREL-SAM Left Ear; Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$.

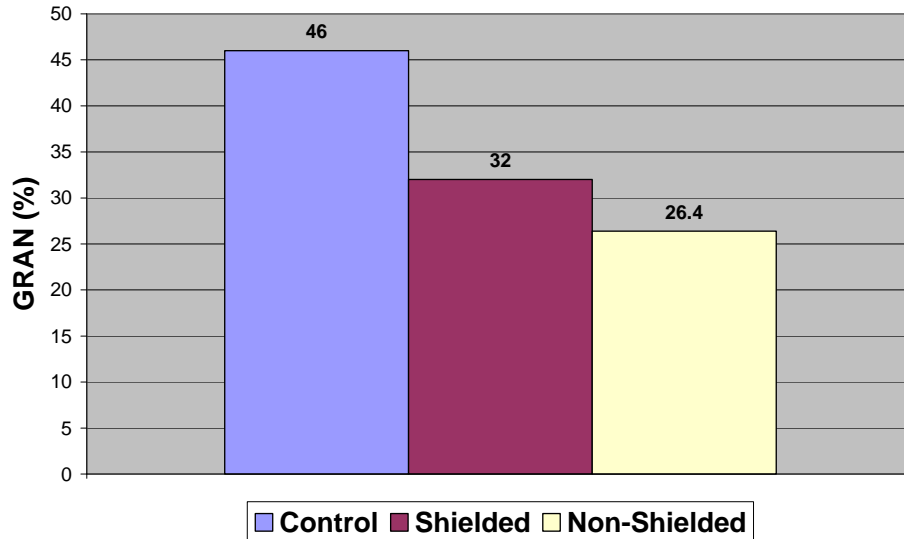
Human Blood Cells Research: Alteration of Percentage Content of White Blood Cells Count after the Exposure of Blood Samples *in vitro* to EMR

The beneficial effect of EMR shielding material (MRET-Shield) on human blood *in vitro* was observed at the laboratory of Cedars-Sinai Medical Center, Los Angeles, USA. The effect of the computer display radiation on human blood samples (22 samples in each group) was studied with and without installation of MRET-Shield and compared to control group not exposed to EMR. The blood samples were exposed to the computer display radiation at the distance of 15” (0.38 meter) for one hour. Test results are statistically valid with $p < 0.01$.

The White Blood Cells (WBC) consist of Granulocytes (GRAN), Lymphocytes (LYM), and “Minimum Inhibitory Dilution,” a measure of rare cells and a number of precursor white cells (MID). The exposure of blood samples to external EMR of the computer display resulted in alteration of the percentage counts in all types of WBC: GRAN, LYM and MID (measured in %). The installation of MRET-Shield on the computer display significantly reduced the level of changes of GRAN and LYM and almost did not affect

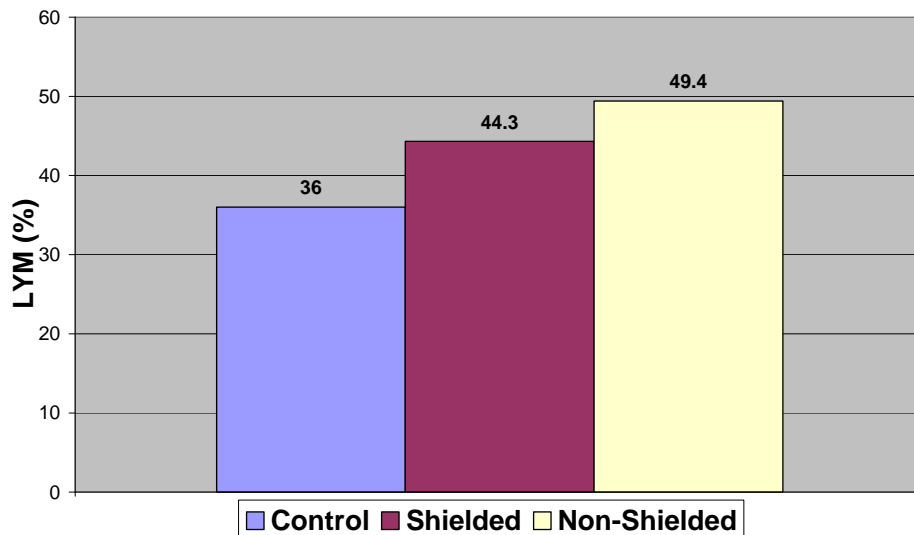
the level of changes in MID count.

EMR Effect on Granulocytes Count

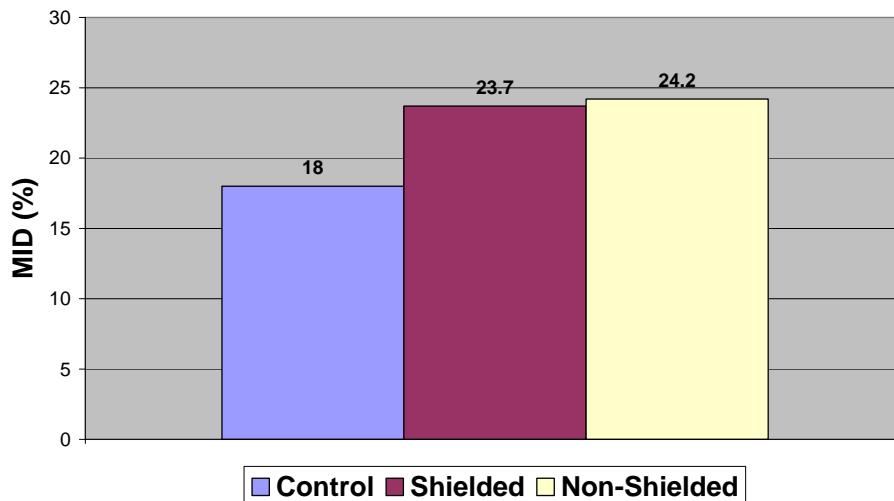


Granulocytes are a critical component of blood and play one of the most important roles in the immune system reactions and their decrease is not beneficial for the body function. The general consensus is that the increase of Lymphocytes above normal level increases the risk of leukemia, lymphomas, skin rash, etc.

EMR Effect on Lymphocytes Count



**EMR Effect on "Minimum Inhibitory Dilution"
(measure of rare cells and precursor white cells)**



The experiment revealed the decrease of Granulocytes count and the increase of Lymphocytes and precursor white cells counts in both cases. It also showed that the installation of MRET-Shield on the computer display significantly reduced the level of changes in Granulocytes and Lymphocytes counts.

The changes in the percentage level of GRAN were reduced by $(32 - 26.4)/(46 - 26.4) = 5.6/19.6 = \mathbf{29\%}$

The changes in the percentage level of LYM were reduced by $(49.4 - 44.3)/(49.4 - 36) = 5.1/13.4 = \mathbf{38\%}$

The changes in the percentage level of MID were insignificantly reduced by $(24.2 - 23.7)/(24.2 - 18) = 0.5/6.2 = \mathbf{8\%}$

Thus, the combined alteration of the percentage counts of GRAN, LYM and MID following the exposure to EMR of the computer display was:

without MRET-Shield 19.6 (GRAN) + 13.4 (LYM) + 6.2 (MID) = **39.2%**

with MRET-Shield 14 (GRAN) + 8.3 (LYM) + 5.7 (MID) = **28%**

This calculation shows that the installation of MRET-Shield on computer display reduced the level of combined changes in the content of White Blood Cells count (GRAN, LYM and MID) by $(39.2 - 28)/39.2 = \mathbf{29\%}$ in this experiment.

This experiment provides evidence that the exposure of human blood samples *in vitro* to EMR affects White Blood Cells morphology related to the stress response. Particularly, it affects such cellular process as growth, division and death of cells in all types of White

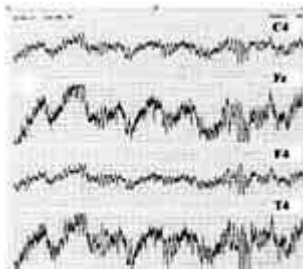
Blood Cells (GRAN, LYM and MID). The installation of MRET-Shield on the computer display significantly reduced the effect of EMR on blood morphology.

Electroencephalogram (EEG) test on human subjects at SA Biomedical Instrumentation Co, San Diego, USA

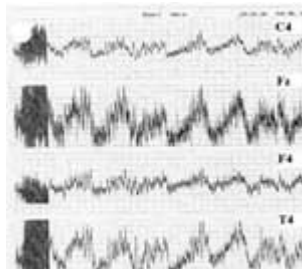
The EEG testing was conducted on the human subject introduced to the influence of EMR generated by the cellular phone (SAMSUNG Model No: SCH-2000) without MRET-Shield and with MRET-Shield installed on the phone.

Each test was run for 3 minutes and four channels were tested in all experiments. The cellular phone was located in standard operating position at the right side of the head.

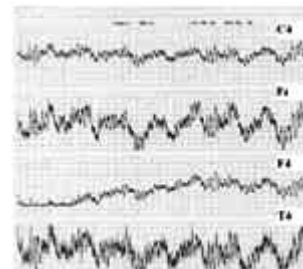
The comparison of the EEG charts with control EEG chart indicates that the installation of MRET-Shield on the cellular phone calms down the brain wave frequencies and can neutralize the electromagnetic stress and excitement caused by EMR emitted by cellular phone.



Control EEG chart of the subject not introduced to EMR of cellular phone



EEG chart of the subject introduced to EMR of cell phone **without** any protection



EEG chart of the subject introduced to EMR of cell phone **with MRET-Shield** protection

Comparative Study of the Effects of Microwave Radiation Neutralizers on Physiological State of Human Subjects

This research was designed to investigate whether microwave (MW) radiation of mobile phone can induce changes in the human's physiological state. The study was conducted at ELSYS Corp, St. Petersburg, Russia with the help of Vibraimage System (RU 2187904, WO 02/51154) on four EMR-protection products: MRET-Shield (US Patent No. 6,369,399 B1) and three other competitive neutralizers – made in Japan (JP), made in Russia (RU), and made in Taiwan (TW). The research was conducted on 10 human subjects with 5 minutes exposure to the mobile phone in each experiment.

1. This research showed that there were statistically significant changes in the physiological state of the human subjects after the 5 minutes exposure to the mobile phone radiation in talk mode.

2. The installation of MRET-Shield on the mobile phone significantly reduced the level of changes in the physiological state of the human subjects and made them insignificant.
3. The installation of all other tested neutralizers on the mobile phone, on the contrary, increased the level of changes in the physiological state of the human subjects.

The Distribution of Frequencies is the most informative integral characteristic of human body micro-vibrations. It shows the values and the range of frequencies of human body micro-vibrations as well as the percentage rate of each frequency in the distribution. There is direct correlation between stress reactions of the body and the changes in the parameters of the Distribution of Frequencies.

The histograms presented below show the difference in the Frequency Distributions of human body vibrations before and after the exposure of the human subject to the mobile phone radiation in talk mode. It is possible to notice that the installation of MRET-Shield on the mobile phone made the difference almost indistinguishable (Fig 2).

The histograms without any neutralizer (Fig 1) and with three other neutralizers except MRET-Shield (the example of Japanese neutralizer on Fig 3) show substantial changes in the Frequency Distributions.

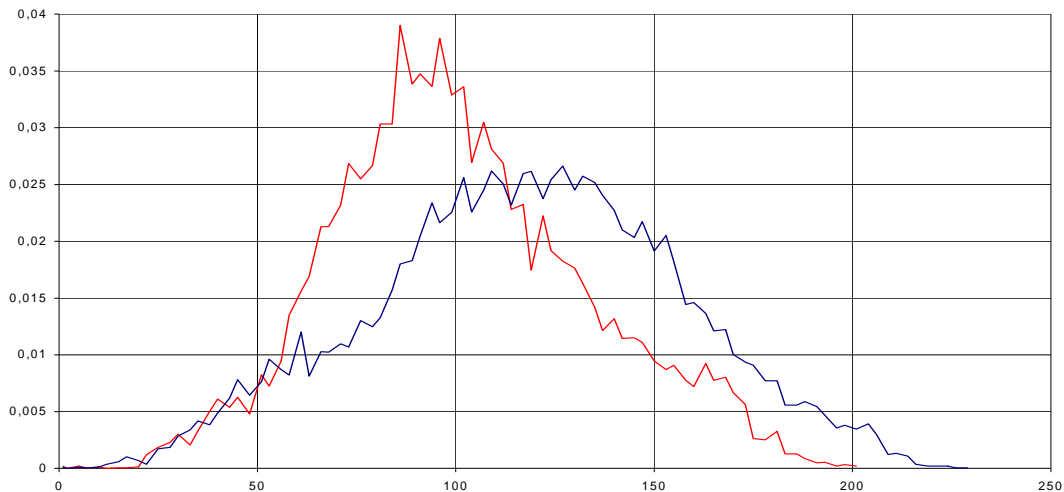


Fig 1: “FM” mode: *the histograms* of human body Frequency Distribution before (red diagram) and after (blue diagram) 5 minutes exposure to the mobile phone in talk mode without any neutralizer.

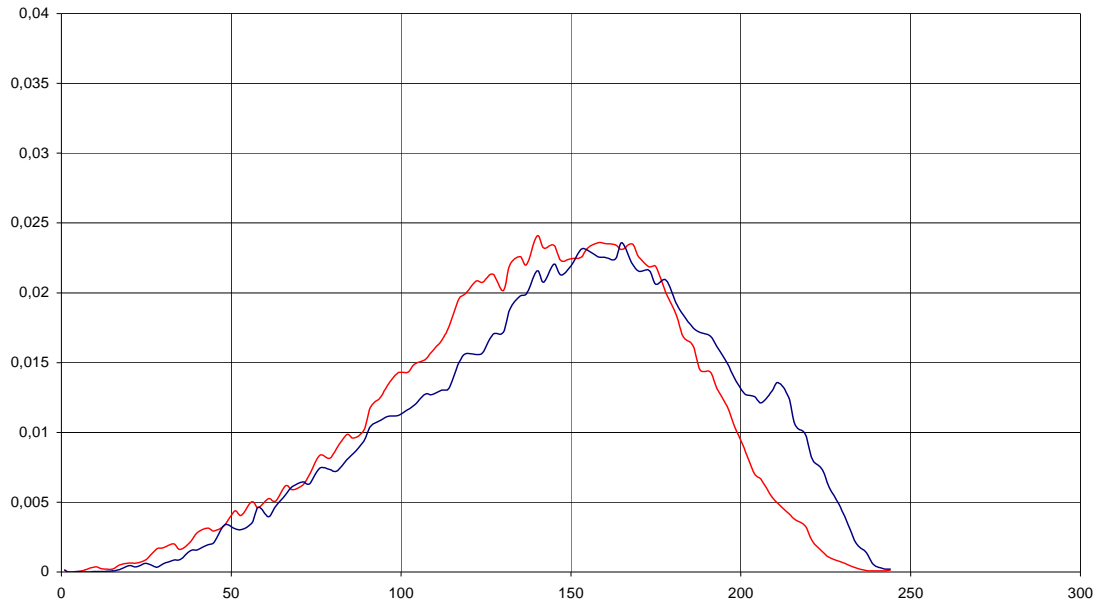


Fig 2: “FM” mode: *the histograms* of human body Frequency Distribution before (red diagram) and after (blue diagram) 5 minutes exposure to the mobile phone in talk mode with MRET-Shield.

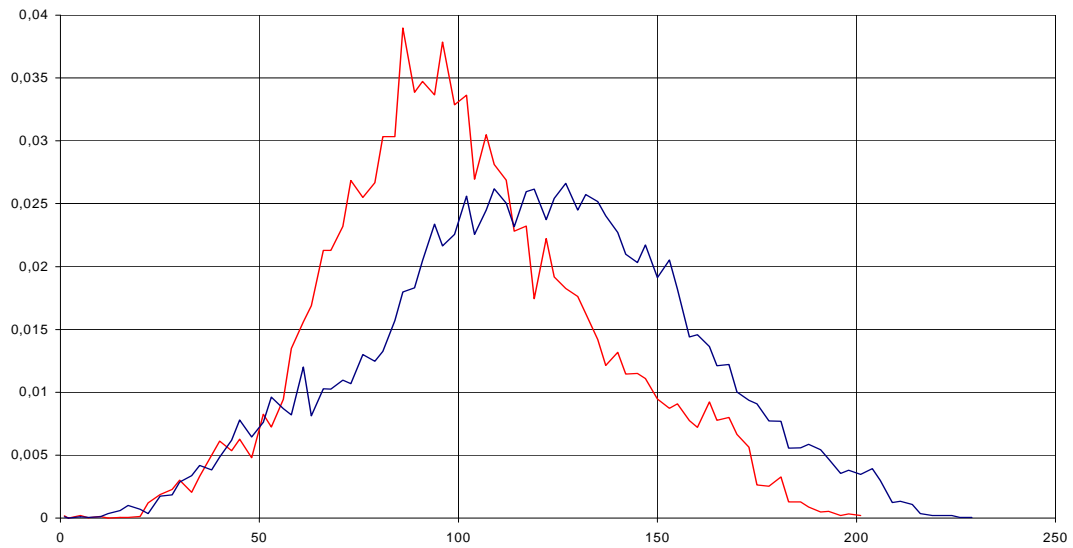
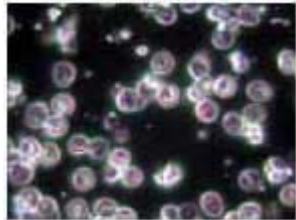


Fig 3 “FM” mode: *the histograms* of human body Frequency Distribution before (red diagram) and after (blue diagram) 5 minutes exposure to the mobile phone in talk mode with Japanese (JP) neutralizer.

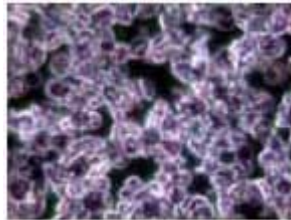
Live Blood Cells Analysis

The Live Blood Cell Analysis was conducted at Quantum Biotech Ltd., Singapore. Drops of blood samples were taken from the fingertip of the subject before and after his introduction to EMR of the cell phone during 5 minutes with and without the installation of MRET-Shield. The blood samples were observed under the microscope.

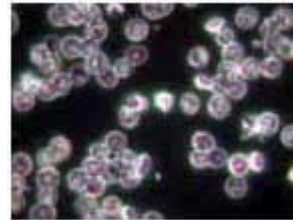
The comparison of the images with control one indicated that the installation of MRET-Shield on cell phone neutralized the effect of EMR at substantial level. The image of blood sample of the subject after his exposure to cell phone without MRET-Shield shows the pattern of Rouleau formation (cells are stacked forming worm-like pattern) which usually corresponds to the symptoms of fatigue, shortness of breath, and poor blood circulation because red blood cells cannot carry enough oxygen. The image of blood sample of the subject after his exposure to cell phone with MRET-Shield shows immediate restoration of blood cells morphology.



Control blood sample of human subject **not exposed to EMR**



Blood sample of human subject **exposed to EMR** of cell phone **without** any protection



Blood sample of human subject **exposed to EMR** of cell phone **with MRET-Shield**

Testing on Plant Seeds, Beans and Yeast

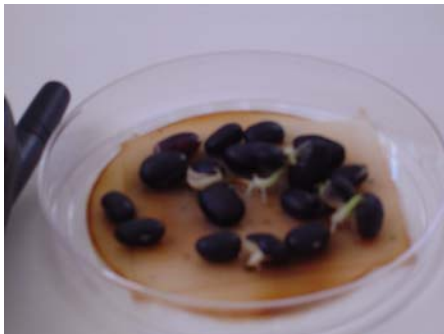
The biological experiment was conducted at Global Quantech, Inc., San Diego, USA on plant seeds, beans, and yeast microorganisms to verify the efficacy of MRET-Shield. Samples of plant seeds, beans, and yeast microorganisms were located in the close proximity to cellular phones. Cellular phones were operating in stand by mode during this experiment, another words, experiment provided effects of the 'near' field.

The significant difference was observed in the growth cycle of green beans, black beans and black seeds on the twelfth day. There was not observed any significant difference in the samples of fennel seeds which did not spread out and in the growth of yeast microorganisms. Based on the results with green beans, black beans and black seeds it is reasonable to conclude that the installation of MRET-Shield on cell phone can protect living cells against harmful, suppressive effects of EMR.

1st day:



12th day



Without MRET-Shield protection

With MRET-Shield protection

Cranial Nerve Cell Test

Cranial Nerve Cell Test was conducted at Tex Chu Ltd., Taypei, Taiwan on 30 human subjects to verify the central nerve system and following immune system reactions to the exposure of human subjects to different sources of electromagnetic radiation with MRET-Shield protection (blue color bar) and without MRET-Shield protection (green color bar) respectively. The results are valid with $p < 0.01$.

This test proved that the installation of MRET-Shield on different sources of EMR actually supports and enhances immune system.

