

# The Effect of Radio Frequency Radiation (RFR) from Cell Phone Usage on In Vitro Human Astrocyte Cells (Glial Cells) and the Subsequent Intervention of the MRET Polymer on RFR Effects

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## Abstract

In light of the current research, the environment poses potential risks which one faces daily from ambient electromagnetic fields (EMFs) in the environment, otherwise known as, electromagnetic radiation. EMFs are unavoidable and certainly there are established relationships between, cancer, leukemia, hormonal dysfunction, miscarriage and numerous other negative effects on the central nervous system, the immune system and many or all of the sixty to one hundred trillion cells in the body.<sup>1,2,3,4,5</sup> EMFs predominantly affect neurological tissue and the largest collection of this tissue is the brain.

It is well documented that cell phones, which emit electromagnetic fields in the radio frequency range, can cause DNA damage, headaches, blurred vision, dizziness, fatigue, short term memory loss, neuralgias, tumours, sleep disturbances, aberrant brain wave activity and changes to cerebral blood flow, including altering the permeability of the blood brain barrier.<sup>6,7,8,9,10,11,12</sup> These findings, both the association and dose-relationships between cell phone usage and disease, place cell phone users into a high risk health group.<sup>13</sup> EMF effects are on a cumulative basis, and recent studies have concluded that cell phone users for greater than ten years have a significantly increased risk of glioma, a form of brain tumour.<sup>14</sup> Morgan has hypothesized, that based on the current body of knowledge involving the incubation

period for tumour growth in conjunction with the conclusive dose-response relationship found with cell phone usage and brain cancer,<sup>15</sup> that one can expect more than 400,000,000 cases of brain tumour in the next ten years.<sup>16</sup> This trend is consistent with the epidemiological studies linking cigarettes to lung cancer.<sup>17</sup>

A piezoelectric liquid crystal polymer of fractal geometry, Molecular Resonance Effect Technology, capable of generating a magnetic noise field, is used in the construction of a cell phone chip that has been shown to significantly decrease the physiological effects of electromagnetic radiation by interrupting the physiological perception of the waveform.<sup>18,19,20</sup>

The most common form of primary brain tumour is a glioma and astrocytomas are the most frequently occurring glioma.<sup>21</sup> A study was conducted to examine the effects of cell phone radiation on Normal Human Astrocytes and the effects of cell phone radiation on Normal Human Astrocytes when the MRET polymer was used as an intervention to radio frequency radiation of the cell phone.<sup>22</sup> The results demonstrated that the cell phone radiation decreased the number of Normal Human Astrocytes and when the cell phone was used with the intervention of the MRET polymer, the number of Normal Human Astrocytes increased.

<sup>1</sup> Wertheimer N, Leeper E. Adult cancer related to electrical wires near the home. *Int J Epidemiol.* 1982; 11:p345-355. <sup>2</sup> Poole C, Trichopoulos D. Extremely low-frequency magnetic fields and cancer. *Cancer Causes Control.* 1991; 2:p267-276. <sup>3</sup> Adey W R. Evidence for tissue interactions with microwave and other nonionizing electromagnetic fields in cancer promotion. In Fiala J and Pokorny J (eds). *Biophysical Aspects of Cancer.* Charles University. Prague. 1987. <sup>4</sup> Draper G, Vincent T, Kroll M E, Swanson J. Childhood cancer in relation to distance from high voltage power lines in England and Wales: a case controlled study. *BMJ.* 2005; 330:p1290-1295. <sup>5</sup> Baris D, Armstrong B G, Deadman J, Theriault G. A mortality study of electrical utility workers in Quebec. *Occupational and Environmental Medicine.* 1996; 53:p25-31. <sup>6</sup> Salford L G, Brun A, Stureson K, Eberhardt J L, Persson B R. Permeability of the blood-brain barrier induced by 915 MHz electromagnetic radiation, continuous wave and modulated at 8, 16, 50, and 200 Hz. *Microsc Res Tech.* 1994; 27(6):p.535-42. <sup>7</sup> Salford L, Brun A E, Eberhardt J L, Malmgren L, Persson B R, 2003, "Nerve Cell Damage in Mammalian Brain After Exposure to Microwaves from GSM Phones." *Environmental Health Perspectives.* 2003;111:p.881-883. <sup>8</sup> Lai H, Singh N P. Acute low-intensity microwave exposure increases DNA single-strand breaks in rat brain cells. *Bioelectromagnetics.* 1995; 16:p.207-210. <sup>9</sup> Hamblin D L, Wood A W. Effects of mobile phone emissions on human brain activity and sleep variables. *Int J Radiat Biol.* 2002; 78:p.659-669. <sup>10</sup> Gandhi G, Singh P. Mobile phone users: Another high health risk group. *J Hum Ecol.* 2005; 18(2):p.85-92. <sup>11</sup> Ahlbom A, Green A, Kheifets L, Savitz D, Swerdlow A. Epidemiology of health effects of radiofrequency exposure. *Environ Health Perspect.* 2004; 112:p.1741-1754. <sup>12</sup> Mild, K H., Oftedal, G, Sandstrom M., Wilen J, Tynes T, Haugdsal B, Hauger E. Comparison of symptoms by users of analogue and digital mobile phones - A Swedish-Norwegian epidemiological study. *National Institute for Working Life, Umea, Sweden.* 1998; 23: p.84. <sup>13</sup> Gandhi G, Singh P. Mobile phone users: Another high health risk group. *J Hum Ecol.* 2005; 18(2):p.85-92. <sup>14</sup> Lahlkola A, Auvinen A, Raitanen J, Schoemaker M J, Christensen H C, Feychting M, Johansen C, Klaeboe L, Lonn S, Swerdlow A J, Tynes T, Salminen T. Mobile phone use and the risk of glioma in 5 North European Countries. *Int J Cancer.* 2007;120 (8):p.1769-1775. <sup>15</sup> Khurana, V. *International Journal of Oncology,* February 2008; 22(2): p.399-407. <sup>16</sup> Morgan L L. Interphone Brain Tumors Studies To Date: An Examination of Poor Study Design Resulting in an UNDER-ESTIMATION of the Risk of Brain Tumors. *BEMS, San Diego,* 12 June 2008. <sup>17</sup> Ibid. <sup>18</sup> Smirnov I V. Polymer Material Providing Compatibility between Technologically Originated EMR and Biological Systems. *Explore! for the Professional.* 2006; (15)4:p.26-32. <sup>19</sup> Smirnov I V. Electromagnetic Radiation Optimum Neutralizer. *Explore! for the Professional.* 2002;11(1):p.45-50. <sup>20</sup> Fisher H W, Pisarek S, Smirnov I V. The Beneficial Effect of MRET-Shield on Blood Morphology in Vitro Following the Exposure to Electromagnetic Radiation of Cell Phone. *Explore! for the Professional.* 2008; <sup>21</sup> Komaroff, A. Harvard Medical School Family Health Guide: Brain and Nervous System. New York. Simon & Schuster. 1999; p.357-358. <sup>22</sup> Smirnov, I V. Synopsis: Exposure of Normal Human Astrocytes Cells to Mobile Phone Radiation with and without MRET-Nylon Protection. Global Quantech, Inc., 2009.

## Introduction

Electromagnetic radiation (EMFs) are unavoidable and there is an established relationship between, cancer, leukemia, hormonal dysfunction, miscarriage and a plethora of negative effects on the central nervous system and the immune system.<sup>23, 24, 25, 26, 27, 28</sup>

EMFs predominantly affect neurological tissue and the largest collection of this tissue is the brain. It is well documented that cell phones, which emit radio frequency radiation, in conjunction with the carrier waves and the actual information transmitted, can cause genetic damage, aberrant brain wave activity and even changes to cerebral blood flow including altering the permeability of the blood brain barrier.<sup>29,</sup>

<sup>30, 31</sup> Since those initial findings, the association and dose-relationships between cell phones and disease place cell phone users into a high risk health group.<sup>32</sup> Cell phones usage has been linked to DNA damage, headaches, blurred vision, dizziness, fatigue, short term memory loss, neuralgias, tumours, and sleep disturbances to name a few.<sup>33, 34, 35, 36, 37, 38, 39, 40, 41, 42</sup>

Dr. V. Khurana, published the findings of his study in February 2008 on the alarming increase in the number of brain tumours due to the increasing electromagnetic radiation in our environment which he proposed are primarily due to cell phones.<sup>43</sup> He stated adamantly, "The link between cell phones and brain cancer can no longer be considered to be a myth."<sup>44</sup>

Specifically there have been conclusive studies proving the relationship between cell phone usage and gliomas, which are the largest group of primary brain tumours.<sup>45</sup> There are several kinds of gliomas: astrocytomas are the most common and can develop anywhere in the brain or spinal cord; brain stem

gliomas, which grow in the lowest part of the brain; ependymomas, which develop inside the brain or in the lining of the ventricles, and oligodendrogliomas, which most often grow in the cerebrum however these are extremely rare tumours.<sup>46</sup>

With the conclusive findings of Lakhola et al (2007) confirming the relationship of cell phone usage to gliomas, and considering the latency periods for developing many cancers are in the range of twenty to thirty years, this would indicate that the world's population is about to enter the plausible time frame where we will see these numbers become significant statistically, and that by 2020 the American medical system will not be equipped to deal with the vast numbers of new cancers.<sup>47</sup>

Cell phones have not been in use for a long time (currently into the third decade) considering the latency period of disease but the evidence points to the fact that there is a disease relationship to electromagnetic field exposure. If we were to extrapolate the growing use of cell phones, the ever-increasing amounts of cell towers, and the virtually omnipresent Wi-Fi signals with the known relationships to disease and the projected latency periods in conjunction with the already existing radio and television generated radiation, it is safe to say that the worst is yet to come. Furthermore, if one were to extrapolate the latency periods for tumour growth based on the existing body of information, one might expect twenty to thirty years as an appropriate target and that by using epidemiological projections similar to those of cigarette smoking, the world should expect a minimum of 400,000,000 victims of brain tumours in this period.<sup>48</sup>

<sup>23</sup> Sage C, Carpenter D, Eds. BioInitiative Report: A Rationale for a Biologically-based Public Exposure Standard for Electromagnetic Fields (ELF and RF). BioInitiative Working Group. USA. August 31, 2007; Section 1:p.3. <sup>24</sup> Wertheimer N, Leeper E. Adult cancer related to electrical wires near the home. *Int J Epidemiol.* 1982; 11:p345-355. <sup>25</sup> Poole C, Trichopoulos D. Extremely low-frequency magnetic fields and cancer. *Cancer Causes Control.* 1991; 2: p267-276. <sup>26</sup> Adey W R. Evidence for tissue interactions with microwave and other nonionizing electromagnetic fields in cancer promotion. In Fiala J and Pokorny J (eds). *Biophysical Aspects of Cancer.* Charles University, Prague. 1987. <sup>27</sup> Draper G, Vincent T, Kroll M E, Swanson J. Childhood cancer in relation to distance from high voltage power lines in England and Wales: a case controlled study. *BMJ.* 2005; 330:p1290-1295. <sup>28</sup> Baris D, Armstrong B G, Deadman J, Theriault G. A mortality study of electrical utility workers in Quebec. *Occupational and Environmental Medicine.* 1996; 53:p25-31. <sup>29</sup> Salford L G, Brun A, Stureson K, Eberhardt J L, Persson B R. Permeability of the blood-brain barrier induced by 915 MHz electromagnetic radiation, continuous wave and modulated at 8, 16, 50, and 200 Hz. *Microsc Res Tech.* 1994; 27(6):p.535-42. <sup>30</sup> Salford L, Brun A E, Eberhardt J L, Malmgren L, Persson B R, 2003, "Nerve Cell Damage in Mammalian Brain After Exposure to Microwaves from GSM Phones." *Environmental Health Perspectives.* 2003;111:p.881-883. <sup>31</sup> Sirav B., Seyhan N. Blood-Brain Barrier Disruption by Continuous Wave Radio Frequency Radiation, *Electromagnetic Biology and Medicine,* 27 (1); (in press), Feb 2009. <sup>32</sup> Gandhi G, Singh P. Mobile phone users: Another high health risk group. *J Hum Ecol.* 2005; 18(2):p.85-92. <sup>33</sup> Lai H, Singh N P. Acute low-intensity microwave exposure increases DNA single-strand breaks in rat brain cells. *Bioelectromagnetics.* 1995; 16:p.207-210. <sup>34</sup> Hamblin D L, Wood A W. Effects of mobile phone emissions on human brain activity and sleep variables. *Int J Radiat Biol.* 2002; 78:p.659-669. <sup>35</sup> Gandhi G, Singh P. Mobile phone users: Another high health risk group. *J Hum Ecol.* 2005; 18(2):p.85-92. <sup>36</sup> Ahlbom A, Green A, Kheifets L, Savitz D, Swerdlow A. Epidemiology of health effects of radiofrequency exposure. *Environ Health Perspect.* 2004; 112:p.1741-1754. <sup>37</sup> Mild, K H., Oftedal, G, Sandstrom M., Wilen J, Tynes T, Haugdsal B, Hauger E. Comparison of symptoms by users of analogue and digital mobile phones - A Swedish-Norwegian epidemiological study. *National Institute for Working Life, Umea, Sweden.* 1998; 23: p.84. <sup>38</sup> Fisher H W. *The Invisible Threat: The Risks Associated With EMFs.* Wood Publishing, Toronto. 2007. <sup>39</sup> Saderzki S, Chetrit A, Jarus-Hakak A, Cardis E, Deutch Y, Duvdevani S, Zultan A, Novikov I, Freedman L, Wolf M. Cellular Phone Use and Risk of Benign and Malignant Parotid Gland Tumors—A Nationwide Case-Control Study. *Am J Epidemiol.* 2008; Feb 15;167(4):p.457-67. <sup>40</sup> Agarwal A, Deepinder F, Sharma R K, Ranga G, Li J. Effect of cell phone usage on semen analysis in men attending infertility clinic: an observational study. *Fertil Steril.* 2007. May 3. <sup>41</sup> Lean G. Mobile phone radiation wrecks your sleep. *The Independent.* January 20, 2008. <sup>42</sup> Khurana, V. *International Journal of Oncology,* February 2008; 22(2): p.399-407. <sup>43</sup> Khurana G. Mobile phones and Brain Tumours- A Public Health Concern. Feb 7, 2008. www.brain-surgery.us. <sup>44</sup> *ibid.* <sup>45</sup> Lakhola A, Auvinen A, Raitanen J, Schoemaker M J, Christensen H C, Feychting M, Johansen C, Klaeboe L, Lonn S, Swerdlow A J, Tynes T, Salminen T. Mobile phone use and the risk of glioma in 5 North European Countries. *Int J Cancer.* 2007;120 (8):p.1769-1775. <sup>46</sup> Komaroff, A. Harvard Medical School Family Health Guide: Brain and Nervous System. New York. Simon & Schuster. 1999. <sup>47</sup> Erikson C, Salsberg E et al. *J Oncology Practice.* 2007;3(2): p.79-86. <sup>48</sup> Morgan L L. Interphone Brain Tumors Studies To Date: An Examination of Poor Study Design Resulting in an UNDER-ESTIMATION of the Risk of Brain Tumors. *BEMS, San Diego,* 12 June 2008.

Spatially coherent magnetic noise fields have been shown to interfere with the physiological reception of the damaging components of radiation at the cellular level and overall offer a form of shielding and consequently minimal and/or no damage can ensue.<sup>49, 50, 51, 52, 53, 54, 55, 56</sup>

A Russian-American scientist, Igor V. Smirnov Ph.D., has invented a polymer that actually incorporates passive magnetic noise field technology to interrupt the perception of electromagnetic radiation wave form from the receptors the body. This technology involves the superimposition of a random noise field wave onto damaging electromagnetic wave forms thereby eliminating all effects.<sup>57, 58</sup>

<sup>59</sup> The MRET- Nylon Polymer compound has a special fractal geometric structure. The nature of fractal nano-rings structure and enhanced piezoelectric properties of this compound generates random, subtle, low frequency oscillations when exposed to the external electromagnetic or radio frequency radiation. The polymer has been shown to significantly decrease or eliminate the physiological effects of electromagnetic radiation.<sup>60</sup> The Patented MRET-Shield polymer has been laboratory tested involving standard acceptable physiological criteria such as EEG, MRA (magnetic resonance angiography), SAR (specific absorption rate), thermography, live blood cell microscopic analysis, and Complete Blood Count (CBC).<sup>61</sup> All of these physiological parameters demonstrate extremely positive results to the point that, in almost all cases, the resultant findings are equal to or superior to the controls.

The MRET polymer can significantly reduce or eliminate both the thermal and non-thermal biological effects of electromagnetic radiation by imposing the random low frequency oscillations (noise field) on RF waves. The theoretical concept of the electromagnetic noise field is related to the ability of the noise field to intervene and offset the thermal effects.

## Method

Dr. Quiang Xu of AltheaDx Technology in San Diego, California was in charge of overseeing the Normal Human Astrocyte investigation.<sup>62</sup> Normal Human Astrocytes (NHA) (Lonza #CC-2565, Lot 80982) were grown in a humidified incubator at 37 °C with 5% CO<sub>2</sub> to generate a sufficient number to conduct the experiment.

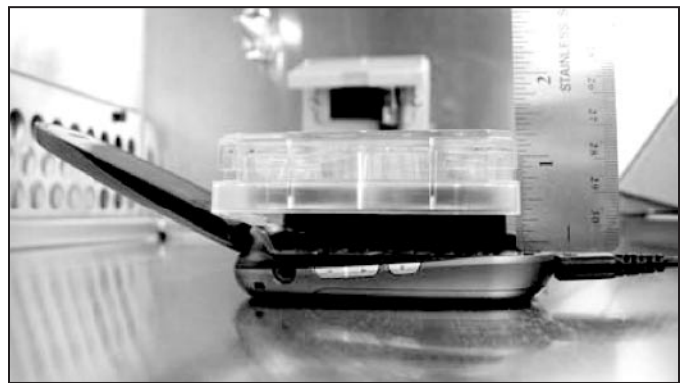
The cells were harvested with trypsin and counted with a hemocytometer using trypan blue. The cell viability was 88.9% and 281,667 cells per well were plated into six wells, two wells each on three six well plates and then incubated overnight.

An LG Verizon cell phone, Model #VX8350, FCC ID BEJ VX8350, SW version #VX835V03, HW Rev. 1.1, MEID A0000000C4F8FC5, employing an AC power source was placed directly beneath and centered under one plate of NHA duplicate cell cultures at a distance of 0.5 inches below the growth surface.

The LG cell phone was called by a phone and the calling phone's hand set was placed next to the speaker of an operating radio so that the cell phone would be continuously active for the duration of the exposure. The cells were exposed to the radiation from the phone for one hour at room temperature. Following the one hour cell phone exposure, the cells were placed back in the incubator for 24 hours.

A second identical NHA culture was then exposed similarly to the same cell phone and in the same geometry with the addition of the MRET-Nylon protection which was placed over the cell phone ear speaker as shown in *Figure 5*.

The cells were exposed to the cell phone radiation for one hour and then placed into the incubator for 24 hours. During the cell phone trial with the MRET-Nylon protection exposure, a third plate containing identical cells labelled 'Control Plate' was placed in another room for one hour. Following an hour at room temperature with no exposure to a cell phone, it was placed into the incubator for 24 hours.



*Figure 1: Exposure of Tissue Culture to Cell Phone Radiation (Side View)*

<sup>49</sup> Li C, Jiang H, Fu Y. A study on dose-effect of suppression to gap junctional intercellular communication function by 50-Hz magnetic fields] *Zhonghua Yu Fang Yi Xue Za Zhi*. 1998; 32(3): p. 142-4. Chinese. <sup>50</sup> Zeng Q, Chiang H, Fu Y, Lu D, Xu Z. Electromagnetic noise blocks the gap-junctional intercellular communication suppression induced by 50 Hz magnetic field] *Zhonghua Lao Dong Wei Sheng Zhi Ye Bing Za Zhi*. 2002; 20(4):p.243-5. Chinese <sup>51</sup> Litovitz T A, Montrose C J, Doinov P, Brown K M, Barber M. Superimposing spatially coherent electromagnetic noise inhibits field-induced abnormalities in developing chick embryos. *Bioelectromagnetics*. 1994;15(2):p.105-13. <sup>52</sup> Litovitz T A, Penafiel L M, Farrell J M, Krause D, Meister R, Mullins J M. Bioeffects induced by exposure to microwaves are mitigated by superposition of ELF noise. *Bioelectromagnetics*. 1997; 18(6):p.422-30. <sup>53</sup> Litovitz T A, Krause D, Montrose C J, Mullins J M. Temporally incoherent magnetic fields mitigate the response of biological systems to temporally coherent magnetic fields. *Bioelectromagnetics*. 1994; 15(5):p.399-409. <sup>54</sup> Yao K, Wu W, Wang K, Ni S, Ye P, Yu Y, Ye J, Sun L. Electromagnetic noise inhibits radiofrequency radiation-induced DNA damage and reactive oxygen species increase in human lens epithelial cells. *Mol Vis*. 2008; (19)14:p.964-969. <sup>55</sup> Yao K, Wu W, Yu Y, Zeng Q, He J, Lu D, Wang K. Effect of superposed electromagnetic noise on DNA damage of lens epithelial cells induced by microwave radiation. *Invest Ophthalmol Vis Sci*. 2008;49(5):p.2009-2015. <sup>56</sup> Wu W, Yao K, Wang K J, Lu D Q, He J L, Xu L H, Sun W J. Blocking 1800 MHz mobile phone radiation-induced reactive oxygen species production and DNA damage in lens epithelial cells by noise magnetic fields. *Zhejiang Da Xue Xue Bao Yi Xue Ban*. 2008; 37(1): p.34-38. <sup>57</sup> Li C, Jiang H, Fu Y. A study on dose-effect of suppression to gap junctional intercellular communication function by 50-Hz magnetic fields] *Zhonghua Yu Fang Yi Xue Za Zhi*. 1998;32(3): p142-4. Chinese. <sup>58</sup> Zeng Q, Chiang H, Fu Y, Lu D, Xu Z. Electromagnetic noise blocks the gap-junctional intercellular communication suppression induced by 50 Hz magnetic field] *Zhonghua Lao Dong Wei Sheng Zhi Ye Bing Za Zhi*. 2002;20(4):p.243-5. Chinese <sup>59</sup> Litovitz T A, Montrose C J, Doinov P, Brown K M, Barber M. Superimposing spatially coherent electromagnetic noise inhibits field-induced abnormalities in developing chick embryos. *Bioelectromagnetics*. 1994;15(2): p.105-13. <sup>60</sup> Smirnov I V. Polymer Material Providing Compatibility between Technologically Originated EMR and Biological Systems. *Explore! for the Professional*. 2006; (15)4:p.26-32. <sup>61</sup> Fisher H W, Pisarek S, Smirnov I V. The Beneficial Effect of MRET-Shield on Blood Morphology *in vitro* Following the Exposure to Electromagnetic Radiation of Cell Phone. *Explore! for the Professional*. 2008;17(4). <sup>62</sup> Smirnov, I V. Synopsis: Exposure of Normal Human Astrocytes Cells to Mobile Phone Radiation with and without MRET-Nylon Protection. Global Quantech, Inc., 2009.



Figure 2: Exposure of Tissue Culture to Cell Phone Radiation (TopView)

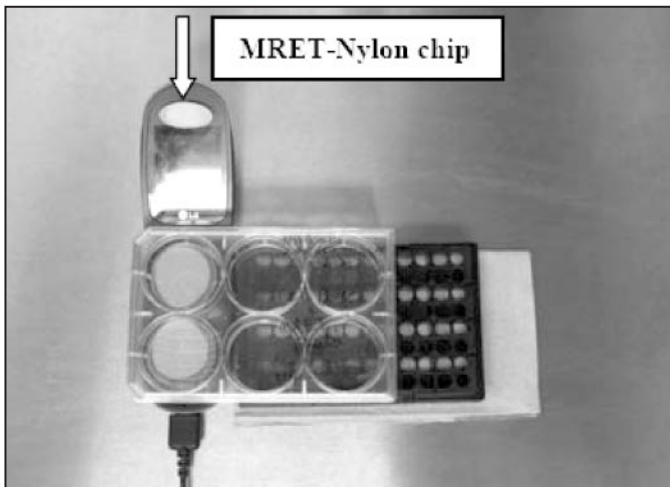


Figure 3: Exposure of Tissue Culture to Cell Phone Radiation with MRET Polymer (TopView)

After the 24 hour incubation period, the cells were harvested from each plate using trypsin and counted with a hemocytometer using trypan blue dye to obtain cell count and viability data. The cell count data consists of replicate wells for each treatment condition. Each cell was harvested using the same volumes and the same pipet procedural action.

For each sample RNA was extracted from the duplicate one, the top well shown in the experimental setup. The RNA was processed according to the Affymetrix Gene Chip Whole Transcript (WT) Sense Target labelling Assay. The resultant labelled cDNA was hybridized to Affymetrix Human Gene 1.0 ST arrays and scanned. The data was normalized using RMA normalization with the Affymetrix Expression Console software. This normalized data was used for the correlation analysis.

<sup>63</sup> Smirnov I V. Polymer Material Providing Compatibility between Technologically Originated EMR and Biological Systems. *Explore Magazine*. 2006;15(4):p.26-32. <sup>64</sup> Gandhi G A. Genetic damage in mobile phone users: some preliminary findings. *Indian J Hum Genet*. 2005;11:p.99-104. <sup>65</sup> Salford L G, Brun A, Stureson K, Eberhardt J L, Persson B R. Permeability of the blood-brain barrier induced by 915 MHz electromagnetic radiation, continuous wave and modulated at 8, 16, 50, and 200 Hz. *Microsc Res Tech*. 1994; 27(6):p.535-42. <sup>66</sup> Khurana G. Mobile phones and Brain Tumours- A Public Health Concern. Feb 7, 2008. www.brain-surgery.us. <sup>67</sup> Litovitz T A, Krause D, Montrose C J, Mullins J M. Temporally incoherent magnetic fields mitigate the response of biological systems to temporally coherent magnetic fields. *Bioelectromagnetics*. 1994; 15(5):p.399-409. <sup>68</sup> Litovitz T A, Montrose C J, Doinov P, Brown K M, Barber M. Superimposing spatially coherent electromagnetic noise inhibits field-induced abnormalities in developing chick embryos. *Bioelectromagnetics*. 1994;15(2):p.105-13. <sup>69</sup> Smirnov I V. Polymer Material Providing Compatibility between Technologically Originated EMR and Biological Systems. *Explore Magazine*. 2006; 15(4):p26-32.

## Results

	Pre-trial Data	Control	Unshielded Cell Phone Trial	MRET Shielded Cell Phone Trial
Cell number count per well	281,667	196,000	175,000	231,000
Cell number count per ml	93,889	70,000	62,500	82,500
Differential %			-10.71%	+17.85%

## Discussion

There are issues that merit discussion in this preliminary investigation since the experimental design intended to examine the effect of radio frequency (RF) radiation emitted by cell phone usage on Normal Human Astrocytes and the potential intervention of these effects by the use of the noise field (MRET) polymer. The unprotected cell phone usage caused a 10.71% decrease in the number of Astrocytes (NHA) when compared to the control value. The MRET protected cell phone usage caused a 17.85% increase in the Astrocyte count. The protective shielding effect of the MRET polymer is statistically significant and the damaging effects of the unprotected cell phone radiation is as well. The addition of the noise field polymer consistently led to the elimination of these effects and in this case a post-incubation increase in astrocytes, a finding that was better than the control. This finding has been consistently corroborated by previous investigations<sup>63</sup>.

The effects of RF radiation have been linked to many diseases and disorders<sup>64</sup> and a relationship has been established to the potential for even greater physiological damage.<sup>65, 66</sup> Since noise fields function via a temporally incoherent mechanism that has demonstrated the ability to alter the perception of the damaging radiation wave,<sup>67, 68, 69</sup> one must assume that not only have there been changes mediated by the noise field polymer to the number of Normal Human Astrocytes, but that other effects and subsequent physiological implications and health risks that were not evaluated in the realm of this study were also reduced or eliminated.<sup>70</sup> The significance of the change in any resultant parameter of an investigation yields a physiological indicator which can then be used merely to interpret the validity of whether or not a change has occurred. The subsequent interpretation of the nature of this change, based on reproducibility will give us insights into the value of the phenomena. This preliminary investigation yielded

results that indicate damaging effects on Normal Human Astrocytes caused by cell phone usage and also the beneficial protective effect of the MRET polymer in totally eliminating those effects. In light of the recent findings on the relationships between cell phone usage and gliomas, the MRET polymer demonstrates a beneficial intervention to protect astrocytes from the combination of electromagnetic and radio frequency radiation damage.

### Conclusion

This investigation provides evidence that a one hour exposure of Normal Human Astrocytes to mobile phone radiation in conjunction with a twenty-four (24) hour post exposure incubation decreases the number of astrocytes. The study also confirmed that the application of the MRET polymer on an active mobile phone reduced the negative biological effects of the microwave radiation (EMR) on Normal Human Astrocytes. 🌸

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<sup>70</sup> Fisher H W, Smirnov I V. *Molecular Resonance Effect Technology: The Dynamic Effects on Human Physiology*. Britannia Publishing. Toronto. 2008;p.113-114.