

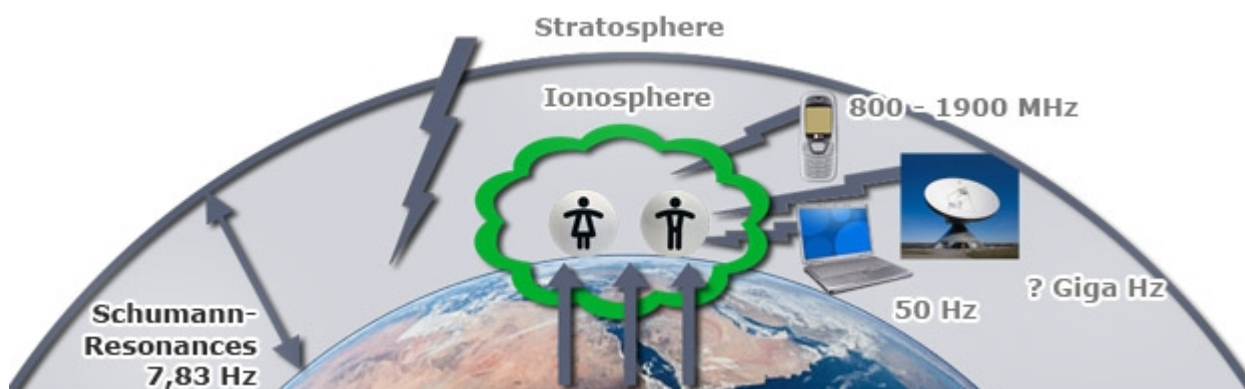


The NASA Research Study

Both the Russian space program and NASA observed that noticeable deteriorations can be seen in people who are in space, even for relatively short periods of time. That included, but was not limited to, bone deterioration, tissue deterioration and even depression.

Those observations prompted research that determined that the essential causative factor was that those people were outside the normal 7.83 Hz Schumann EMF signals of the earth, and prompted additional research to determine what could be done to resolve the problem.

That research led to the development of Pulsed Electromagnetic Field (PEMF) technology and devices that, in effect, technologically replace the natural PEMF frequencies of the Earth with similar signals generated with technology.





Thomas J. Goodwin, Ph.D.

Dr. Thomas J. Goodwin is best known for his work in physiology and bioengineering research, particularly for the study of human physiology and tumor biology, 3-D models as microbial hosts for infectious disease, and research into the **effects of ultra-low frequency electromagnetic fields on human tissues.**

Dr. Goodwin has been granted 20 U.S. patents, with several disclosures pending, has published more than 45 peer-reviewed scientific papers and is the recipient of more than 55 NASA Scientific and Technical awards. He is based at NASA's Johnson Space Center (JSC) in Houston, Texas.

NASA 4-year collaborative study on the efficacy of electromagnetic fields to stimulate growth and repair in mammalian tissues.

CHIEF INVESTIGATOR: Thomas J. Goodwin, Ph.D., Lynden B Johnson Space Center

The 4 year NASA study lead by Dr. Thomas Goodwin, PhD, on the ability of PEMF to improve the growth and repair of tissues in mammals is ground breaking research.

The research was not limited to PEMF therapy, but also **included forms of energy medicine including lasers, LEDs and static magnets.** After finding **PEMFs were the most effective in healing and regeneration**, Dr. Goodwin and his team looked at many different PEMF parameters including frequency, waveform, intensity, etc. What NASA found was that the **best results and greatest efficacy** came from **Low Frequency, Low Intensity, and Rapidly varying PEMF signals.** Basically frequencies and intensities that **closely match what the Earth gives us** with a signal that produces maximum healing effects on the body!

Specifically, NASA found the **best results with the PEMF** parameters below:

Rapid Time Varying Waveform – Specifically the Squarewave (sawtooth also fits this criteria)

Low Frequency: 10 Hz (close to the frequencies of earth)

Low Intensity: 1 – 20 microTesla, which is even less than the strength of the earth's magnetic field (33 – 66 microTesla)

Additionally NASA found that slowly varying (millisecond pulse, sine wave), non-varying (static magnetic) and LASERS had little or no effect.

The NASA study on frequency:

A waveform (TVEMF) generator of original design and capability was developed and used to generate the square wave waveform of strengths 1-6 mA (AC) , **10 Hz variable duty cycle**, which was pulse-width modulated. NHNP cells were subjected to these extremely **low-frequency magnetic fields**.

The NASA study related to intensity and waveform:

Initial results with the NHNP cells were quite startling, using **extremely low-level magnetic fields** (1 –20 microTesla). That is lower than the approximately 50 microTesla magnetic field strength of the Earth. They found the low-amplitude, rapidly time-varying magnetic fields exerted a very potent effect on the proliferation, morphology, and gene expression of the cells in culture, both in standard 2-dimensional culture plates as well as cells organized into 3-dimensional tissue clusters.

NASA discovered that the **benefits** of low frequency, low intensity, rapidly varying square wave PEMF includes **better healing** and **regeneration of damaged or diseased tissue**, greater **cell longevity**, **accelerated cell growth**, **improved cellular voltage** (mainly observed in nerve cells), upregulation of genes related to **collagen production**, **cell restoration**, and **cell growth**. *NOTE: upregulation is a mechanism that increases the creation of certain gene products.*

This study is a **landmark in proving the efficacy of PEMF therapy on human cells** for healing, growth and regeneration, specifically human nerve cells. These findings confirm that the **human body needs frequencies and intensities close to what the earth provides**, along with a rapidly varying waveform.

Dr. Goodwin has a patent on a PEMF device that uses these parameters. NASA's prototype developed at the Johnson Space center uses the low frequency, low intensity rapidly varying waveform.



Train Harder, Recover Faster, Perform Better!