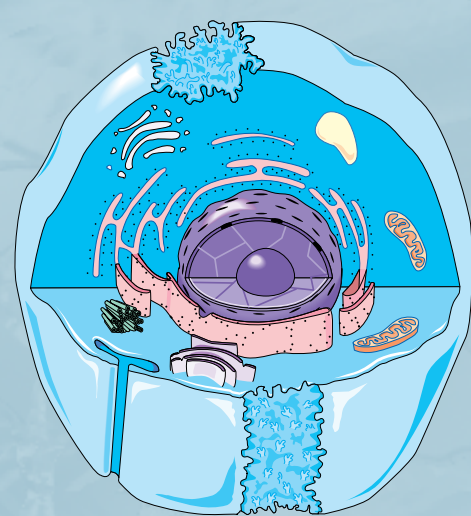


A "NEW CELL BIOLOGY" IS BEING ARTICULATED NOW THAT IS RELEVANT TO OUR STUDIES. CELLS ARE NO LONGER CONSIDERED TO BE MEMBRANE "BAGS" HOLDING ORGANELLES AND CYTOPLASM TOGETHER. RATHER, CELLS ARE ORGANIZED GELS AND SOLS THAT PHASE TRANSITION RAPIDLY IN RESPONSE TO MICRO-TO-MACRO STIMULI OF MANY KINDS.

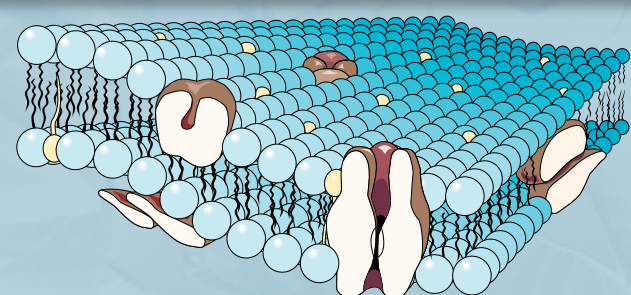
FOR ARTIFICIAL EMF TO AFFECT SO MANY ORGANELLES, CELL TYPES AND WHOLE TISSUES, SOMETHING UBIQUITOUS IS LIKELY INVOLVED. THE "BIG PICTURE" IS SUGGESTED IN OTHER MAPS AT [OSCILLATORIUM.COM](http://OSCILLATORIUM.COM). THIS MAP OFFERS A SAMPLING OF INTRACELLULAR/ORGANELLE EFFECTS AS DEMONSTRATED BY STUDIES.



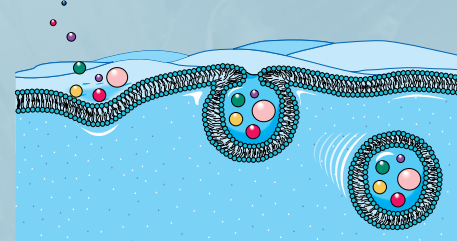
Cell with organelles

**THE NEW CELL BIOLOGY:**  
 ★ [GILBERT LING](#), [MAE-WAN HO](#)  
[GERALD POLLACK](#)

SEE OTHER MAPS:  
[INTERFACIAL WATER AND EMF](#)  
[TISSUE/ORGAN EFFECTS](#)  
[BIO-EFFECTS OVERVIEW](#)  
[PROPOSED MECHANISMS](#)  
[INDEX OF CELLULAR EFFECTS](#)



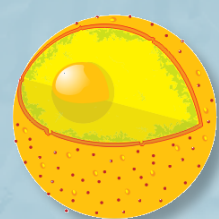
Membrane and Receptors



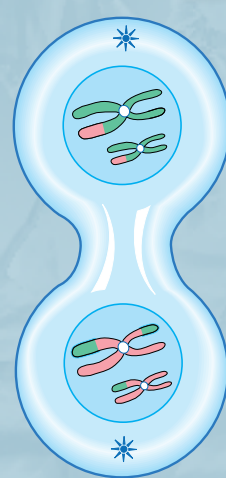
Membrane Vacuoles



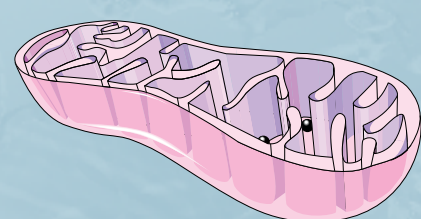
DNA Strand



Cell Nucleus



Dividing Cell



Mitochondrion

Cell death [Features of apoptosis](#)

[MW, pre-apoptotic signal](#)

Cell division [DNA and trophoblasts](#)

[Decreased reproduction](#)

Cellular oxidative stress [Oxidative stress and power line fields](#)

[Alterations in mitochondrial membrane](#)

[Induction of detoxification mechanisms](#)

Cellular nitrosative stress [Power line electric fields](#)

Changes in hormonal function [Melatonin antiox. function compromised](#)

Gene expression [Stress response genes](#)

[Multiple genes change expression](#)

Intracellular ions [Calcium oscillations](#)

[Cyclotron resonance](#)

Lipid damage [Peroxidation](#)

Membranes [Electroporation](#)

[Depolarization alterations](#)

[RF/MW induces clustering](#)

[Magnetic fields alter clustering](#)

[Millimeter waves, membrane changes](#)

[Cytoplasmic membrane shields organelles](#)

[Voltage sensitivity of ion channels changes](#)

[ELF inhibits T-type calcium channels](#)

Microfilaments [Magnetic field pulls](#)

Mitochondria [DNA oxidative damage](#)

[Mitochondrial dysfunction](#)

[Mitochondrial membrane unfolding](#)

Nuclear elements [DNA strand breakage](#)

[Chromatin condensation](#)

★ [Activation, stress genes](#)

[ELF, DNA strand breakage](#)

[Nuclei move in electric field](#)

[Transcription/translation changes](#)

Protein damage [Oxidation of proteins](#)

[Protein synthesizing properties](#)

[Advanced oxidation protein products](#)



Home: [Oscillatorium](#)  
 Newest version: [this map](#)  
 Date of this update: 11-14-15

**IMPORTANT INTRACELLULAR EFFECTS:**

- Alterations of calcium movement
- Oxidative stress
- Nitrosative stress
- Free radical damage to genetic material
- Alterations in gene expression
- Magnetic fields pull on cellular elements
- Magnetic fields pull on receptors
- Microwave effects on cell proteins
- Electric fields move charged elements
- Ion cyclotron resonance