

[ICEEMS: NON-THERMAL EFFECTS AND MECHANISMS](#)

★ [NIH TOXICOLOGY STUDY COMMENTS](#)

**MARTIN PALL**  
[PPT: EMF, BIO-EFFECTS MW ACT VIA VGC CHANNELS](#)  
[5G: 8 TYPES OF GREAT HARM](#)  
[VIDEO: UNEXPLAINED ILLNESSES](#)  
 ★ [VIDEO: HOW WIRELESS CAUSES EFFECTS](#)

[BIOINITIATIVE REPORT 2012](#)

★ [CINDY SAGE DISCUSSES THE BIOINITIATIVE](#)  
 ★ [CINDY SAGE GIVES HISTORY OF BIOINITIATIVE](#)

[BIOINITIATIVE PUBLIC SUMMARY 2014](#)

★ [WIFI HEALTH EFFECTS:](#)

★ [TETRA HEALTH EFFECTS:](#)

★ [DIGITAL TV HEALTH EFFECTS](#)

★ [MICROWAVE HEALTH EFFECTS](#)

★ [RFID READER HEALTH EFFECTS:](#)

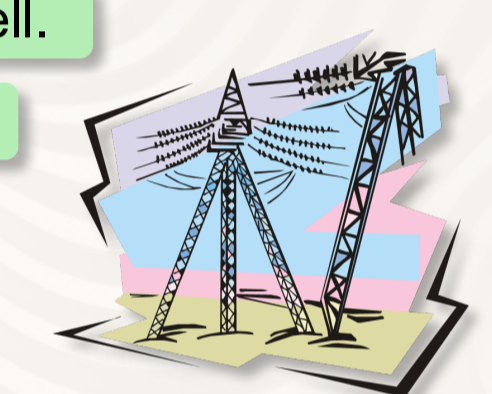
★ [SMART METERS HEALTH EFFECTS](#)

★ [MAGNETIC FIELDS HEALTH EFFECTS](#)

★ [CORDLESS PHONES HEALTH EFFECTS](#)

★ [WIRELESS COMM. DEVICES HEALTH EFFECTS](#)

★ [INTERMED. FREQUENCY MW HEALTH EFFECTS](#)



★ [MM WAVE AIRPORT BODY SCANNERS HEALTH EFFECTS](#)

[RON POWELL: OVERVIEW](#)

[ANDREW GOLDWORTHY: 2008 SLIDE SHARE](#)

[NEIL CHERRY: DOCUMENTS](#)

★ [DEVRA DAVIS: CHILDREN](#)

[MARTIN BLANK: NEW BOOK](#)

★ [ROSS ADEY: BIO. EFFECTS](#)

[DARIUSZ LESZCZYNSKI: 4 TAPES](#)

[JACK KRUSE: BIOEFFECTS OVERVIEW](#)

[OLLE JOHANSSON: SUMMARY VIDEO](#)

★ [JERRY PHILLIPS: CELLPHONES, TUMORS](#)

[DIMITRIS PANAGAPOULOUS: BIOLOGIC EFFECTS](#)

[CAMILLA REES: OVERVIEW LECTURE OF BIOEFFECTS](#)

[PAUL DART: WIRELESS TECH. HEALTH EFFECTS](#)  
[PAUL DART: DOCUMENTS TO FCC, REDUCE EXPOSURE](#)

★ [JOEL MOSKOWITZ: 5G \(MM WAVE\) HEALTH EFFECTS](#)

[JERRY FLYNN: COMMUNICATIONS ENGINEER, EMF DANGERS](#)

★ [ULRICH WARNKE: BIRDS, BEES, DESTRUCTION OF NATURE](#)

[K. SRI NAGESWARI: BIO-EFFECTS OF MW, MOBILE TELEPHONY](#)

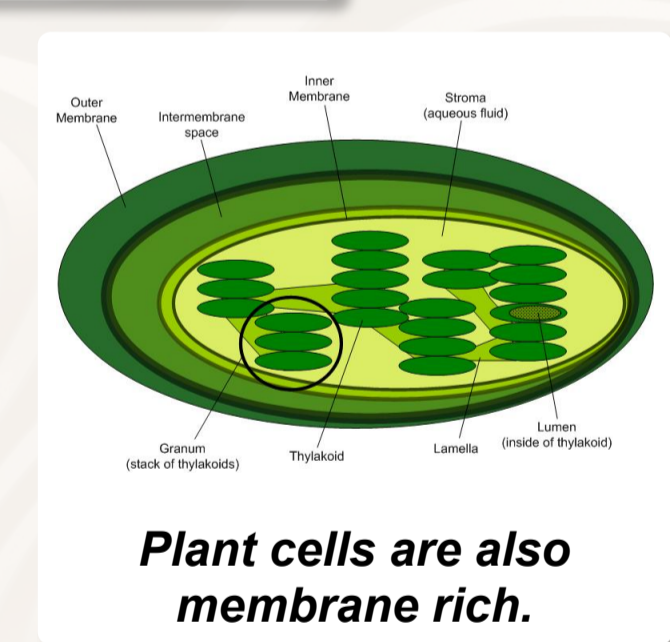
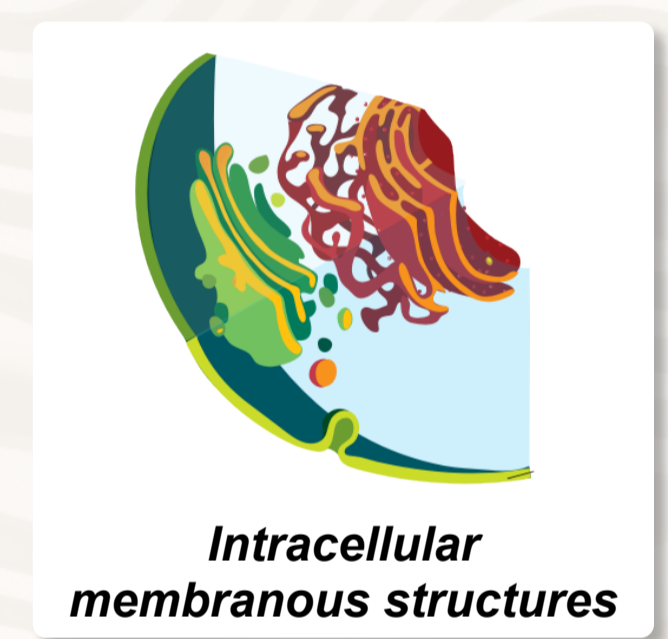
★ [ERICA MALLERY-BLYTHE: EMR, A MODERN HEALTH HAZARD](#)

**EMF AND BIOEFFECTS:  
 CASCADES OF  
 CELLULAR EVENTS**  
 EXPERTS SPEAK OUT

True for ELF as well as RF modulated at ELF.

16 Hz. most important window

Nonlinear windows:  
[Carl Blackman, Ph.D.](#)



HF pulsed alternating fields produce currents.

Complex modulated frequencies on RF carrier waves induce physiologic effects, particularly in some frequency windows.

Mechanism (per Goldsworthy): Divalent pos-ions such as calcium are shaken from membrane during active windows of pulsed EMF, and are replaced by monovalent pos-ions such as potassium -- at certain frequencies. Membrane potassium allows leakage; calcium and other molecules enter cell, initiating **activity cascades**.

Mechanism (per Pall): EMF strikes membrane and triggers opening of voltage gated calcium channel. Calcium enters cell and initiates **activity cascades**.

Mechanism (as understood, per Ling/Pollack et al): Intracellular water forms hydration shells (EZs) at neg-charged protein/polymer surfaces, separating them. Events which alter water structure (such as EMF) cause water to exit space and divalent pos-ions such as calcium enter to link neg-charged proteins/polymers. As proteins undergo conformational change, **activity cascades** are initiated. Water dynamics are responsible for metabolic cascades rather than membrane functions.

Calcium triggers intracellular event cascades, using resources and energy, producing waste, free radicals.

Free radical damage from mitochondrial activity, resource depletion may occur.

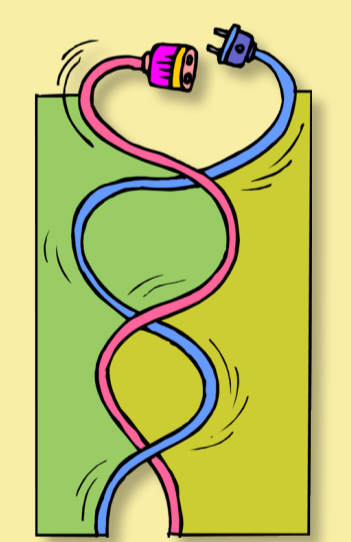
Free radicals damage extra-, intracellular membranes, DNA, RNA.

Cellular activity within damaged organelles spills lysosomal content inside the cell.

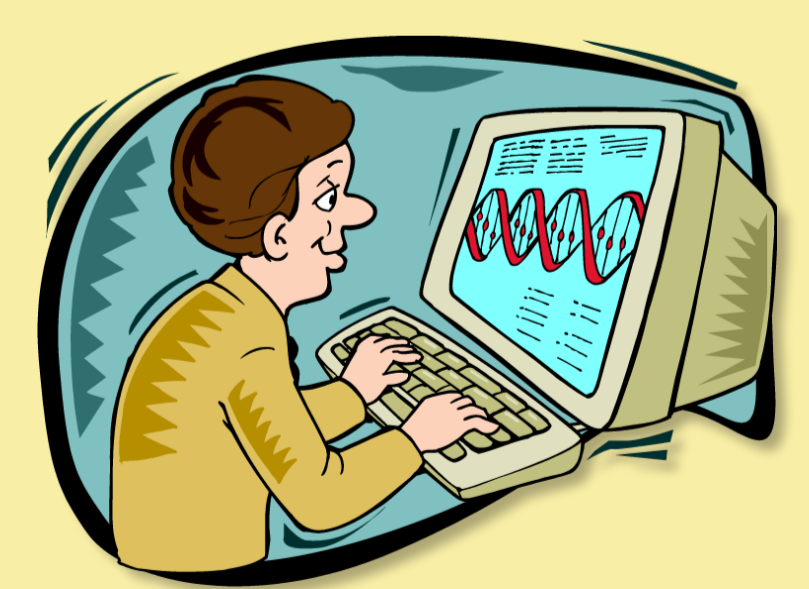
Cellular activity may bring neurons too close to threshold, triggering aberrant firing.

SPECIFIC MAPS RELATED TO THESE EFFECTS:

Microwaves pass more easily through membranes than lower frequency waves, due to the resistance properties of cell membranes.



EMF-treated water is just as damaging to membranes as EMF application, so it may be that "treated (cell phone to head)" blood may damage membranes throughout the body.



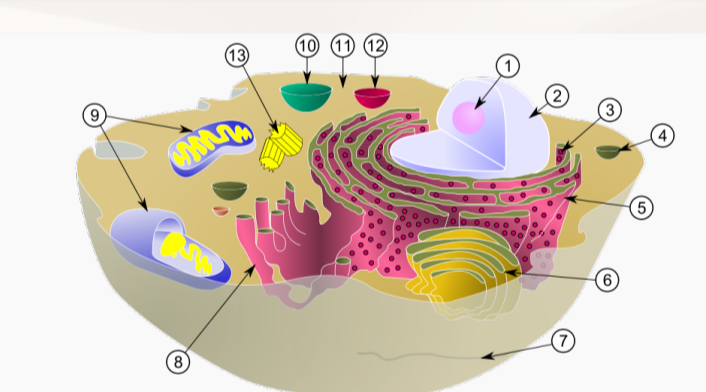
The bio-effect "is not a heating effect, but mainly an electrical effect on the fine structure of the electrically-charged cell membranes upon which all living cells depend."

- [EEG](#)
- [DNA](#)
- [Cells](#)
- [Brain](#)
- [Blood](#)
- [Water](#)
- [Autism](#)
- [Tinnitus](#)
- [Insomnia](#)
- [Hormesis](#)
- [Melatonin](#)
- [Nonlinearity](#)
- [Methylation](#)
- [Natural EMF](#)
- [Membranes](#)
- [Mitochondria](#)
- [Timing Stress](#)
- [Free Radicals](#)
- [Electric Fields](#)
- [Calcium Efflux](#)
- [Mechanisms](#)
- [Living Systems](#)
- [Memory Problems](#)
- [Modulation Effects](#)
- [NeuroInflammation](#)
- [Mast Cell Response](#)
- [Alzheimer's Disease](#)
- [DNA Fractal Antenna](#)

**HANDBOOK BIO-EFFECTS EMF**

CLASSIFICATION OF EFFECTS:

- By type of field/radiation**
  - Magnetic
  - Electric
  - Static
  - Radiofrequency
  - Combination and variations
  - Duration of exposure(s)
- Thermal vs. non-thermal effects**
  - Heat-induced structural changes
  - Stress and adaptive changes
- By part of body affected**
  - Organ/tissue
  - Cell or organelle
  - Receptor or ligand
  - Molecular effects
- By change in function**
  - Free radical cycles
  - Oscillatory behavior
  - Electrical behavior
  - Movement of ions
  - Gene expression
  - Energy production
  - Membrane permeability, functions
- By symptoms**
  - Perceived physiologic
  - Observed physiologic
  - Observed pathologic
  - Cognitive, behavioral



MesserWoland

**MEMBRANE-RICH STRUCTURES OF CELL INTERIOR**

- Organelles:
- (1) Nucleolus
  - (2) Nucleus
  - (3) Ribosomes (little dots)
  - (4) Vesicle
  - (5) Rough endoplasmic reticulum (ER)
  - (6) Golgi apparatus
  - (7) Cytoskeleton
  - (8) Smooth ER
  - (9) Mitochondria
  - (10) Vacuole
  - (11) Cytosol
  - (12) Lysosome
  - (13) Centrioles within Centrosome



WHAT HAPPENS WHEN CALCIUM ENTERS CELL?

Cellular activity is initiated and amplified.  
 Mitochondrial activity speeds up, more ROS.  
 Energy produced, cell might fatigue.  
 Nutrients are used, perhaps depleted.  
 Bi-products created, released.  
 Cortisol, adrenalin upregulated, fatigued.  
 Immune system suppressed.  
 Neurons closer to threshold, more irritable.  
 Neurodevelopment altered by spurious signals.  
 Cell resources redirected to pump extra calcium out of cell  
 Foreign chemicals and allergens more easily penetrate membrane  
 Entrance of albumin through blood-brain barrier damages neurons  
 Stratum granulosum of the skin may weaken, allowing substances to penetrate

ALL TISSUES ARE AFFECTED -- SOME MORE THAN OTHERS

- Fluid elements
- Genetic tissues
- Epithelium
- Special sensory organs
- Immune system tissues
- Nervous system tissues
- Endocrine tissues
- Cellular elements
- ReDox elements
- Membranes and receptors