



Voltage gated calcium channel protein

STUDYING THE DIVERSE EFFECTS OF ELECTROMAGNETIC FIELDS ON CALCIUM PHYSIOLOGY ALLOWS US TO UNDERSTAND WHY THERE ARE SO MANY DIFFERENT KINDS OF RESPONSES BY LIVING TISSUE. THIS MAP OFFERS SEVERAL OVERVIEWS AND A SELECTION OF INFORMATIVE STUDIES.

PARTIAL LIST OF EFFECTS OF EMF, ELF ON CALCIUM IN THE BODY

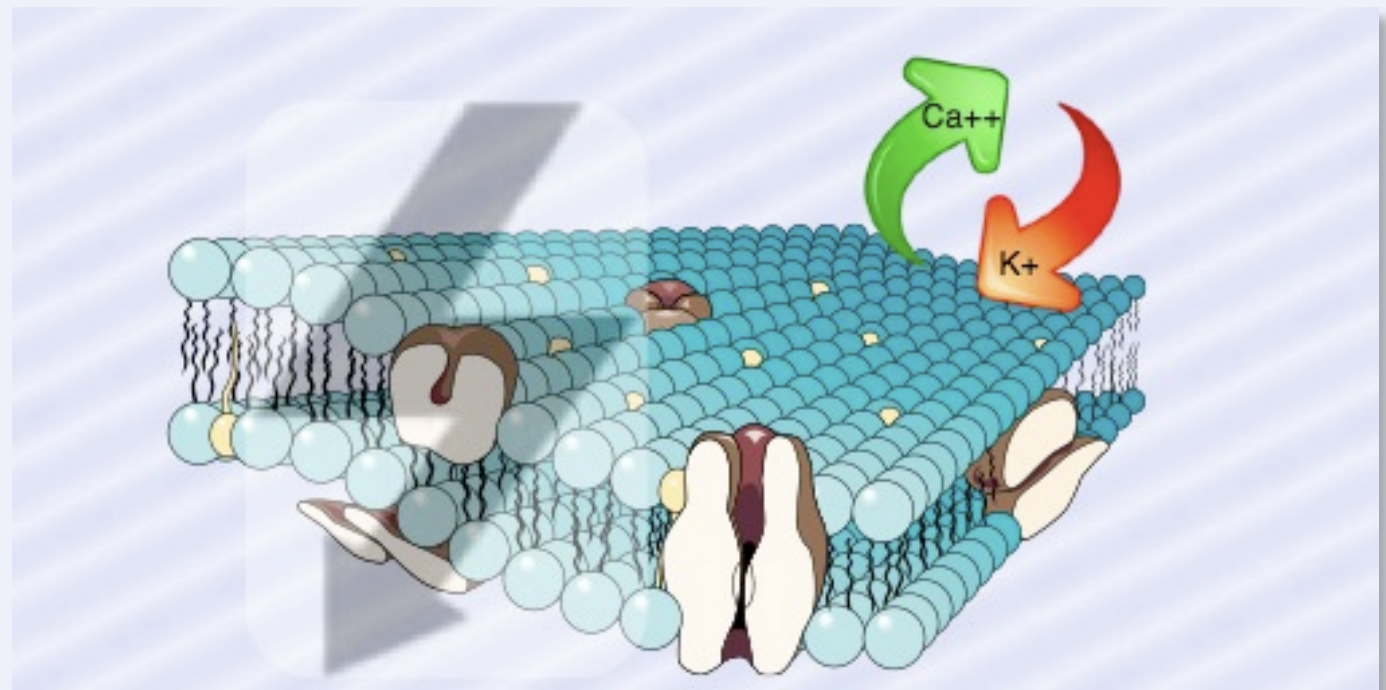
Membranes are structurally weakened when calcium replaced by potassium
 Calcium moves into cells as calcium channels open
 Lysosomes, weakened, leak enzymes, which can damage DNA
 Ornithine decarboxylase enzyme is activated
 Spurious cell signaling occurs from calcium-activated neurotransmitter releases
 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

CALCIUM EFFLUX AND EMF

"Dr Blackman has conducted far more experiments in his laboratory on this influx/efflux than anyone else. They have shown that calcium ion alteration occurs at particular carrier frequencies, particular signal strengths, particular modulation frequencies and in particular temperature ranges, but not in others which lie between them."

"The increased intracellular Ca²⁺ produced by such VGCC activation may lead to multiple regulatory responses." *Martin Pall*

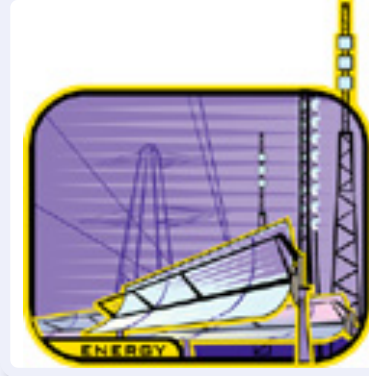
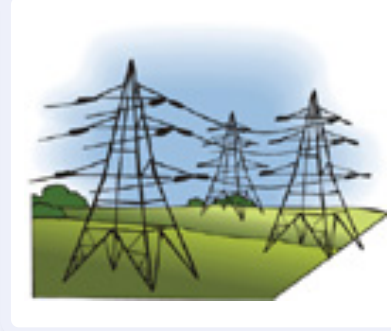
"Only if the frequency is low will the calcium ions have time to be pulled clear of the membrane and replaced by potassium ions before the field reverses and drives them back." *Mohammed Ygoub Esmail*



LOW FREQUENCY ALTERNATING FIELDS, AND HIGH FREQUENCY RADIATION IN SPECIFIC LOW FREQUENCY PULSED AMPLITUDE MODULATION WINDOWS, "CATAPULT" POSITIVELY-CHARGED DIVALENT CALCIUM OFF THE NEGATIVELY-CHARGED CELL MEMBRANES. AT LOW FREQUENCIES, IT MAY BE REPLACED BY MONOVALENT POTASSIUM (WHICH IS MUCH HIGHER IN CONCENTRATION AND MORE ENERGETIC AND CHEMICALLY ACTIVE DUE TO CYCLOTRON RESONANCE). POTASSIUM BONDING IS NOT AS PROTECTIVE TO MEMBRANES AND ALLOWS MORE (POTENTIALLY TOXIC) SUBSTANCES TO ENTER THE CYTOPLASM.

Studies

- [Bone calcium loss in ELF](#)
- [Cell death by calcium influx](#)
- [Role of calcium in electrotaxis](#)
- [Calcium ion efflux from brain tissue](#)
- [EMF, calcium, cyclotron resonance](#)
- [Bawin study on calcium efflux, EMF](#)
- [Biomarkers of induced EMF, cancer](#)
- [ELF, calcium channels, endocytosis](#)
- [Calcium increase in embryonic cells](#)
- [Loss of hippocampal pyramidal cells](#)
- [Blackman study, AC and DC, calcium](#)
- [Blackman study, calcium efflux, EMF](#)
- [Intracellular calcium oscillations, ELF](#)
- [ELF, upregulation of calcium channels](#)
- [Frequency windows and calcium efflux](#)
- [Blackman study: effects of temperature](#)
- [Altered intracellular calcium homeostasis](#)
- [Power-density windows of calcium efflux](#)
- [EMF, membrane calcium channel protein](#)
- [ELF, calcium channels, signaling changes](#)
- [Pulsed EMF, calcium influx, repair altered](#)
- [Calcium dependent functions affected by EMF](#)
- [HF-EMF, calcium channels, Brownian dynamics](#)
- [Calcium channels, EMF, neuropsychiatric conditions](#)
- ★ [Hippocampal Ca channels decreased by 835 MHz](#)
- [Increased calcium in cells, more channels opened in EMF](#)
- [Rapid influx of calcium with few E-pulses in high F, higher T](#)



- MARTIN PALL:**
- [PAPERS, VIDEO, AUDIO PRESENTATION, SLIDES](#)
 - [DR. MERCOLA INTERVIEW](#)
 - [VIDEO ON WIFI HEALTH EFFECTS](#)
 - [VIDEO ON EMF, CALCIUM CHANNELS](#)
 - [VIDEO: HOW WIRELESS CAUSES EFFECTS](#)
 - [AUTISM, CALCIUM CHANNELS, NMDA-RS](#)

RELATED MAP:
[EMF BIO-EFFECTS](#)

LIST OF STUDIES:
[EMF, CALCIUM EFFLUX](#)

(NOT EMF, BUT RELATED TO CALCIUM FUNCTION IN PHYSIOLOGY)
ROLE OF CALCIUM IN METABOLISM:
[CELLS, GELS, AND THE ENGINES OF LIFE](#)

- Overview articles
- [Cellphones, II: Calcium ion efflux](#)
 - ★ [VGCCs and Neurodegeneration](#)
 - [Martin Pall: WiFi, EMF biological harm](#)
 - [TetraWatch: Pulsed RF may affect efflux](#)
 - [The Cell Phone and the Cell: the Role of Calcium](#)
 - [Martin Pall: MW EMF acts on VG Calcium Channels](#)
 - [Andrew Goldsworthy: EMF, Calcium, slide presentation](#)
 - [Martin Pall: Calcium Efflux as mechanism of EMF effects](#)



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