

# New Scientific Evidence on How Exposure to Electromagnetic Radiation Affects our Health

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There have been countless research studies in the last two decades finding strong [correlations between exposure to electromagnetic radiation and numerous health symptoms and diseases](#). But until recently no one has been able to clearly and conclusively explain why or how EMFs actually create health effects.

This has now been accomplished by Martin Pall, Professor Emeritus of Biochemistry and Medical Sciences at Washington State University.

He observed that because the pieces to this puzzle have been researched in a number of different domains, the solution has been in plain sight for twenty years but was not recognized until he put the pieces together.

In his recent [article](#) reviewing 24 research studies on how exposure to electromagnetic radiation affects animal cells and tissue, Martin Pall states:

*One of the great puzzles about the action of electromagnetic fields is how can they influence the biology of our bodies? The reason that this is such a great puzzle is that these fields are comprised of low energy photons, with energies too low to influence the chemistry of our bodies. So how can they possibly influence our biology? Many have argued that the only thing that they can possibly do is to heat things, and yet it is very clear that levels of exposure that produce only the slightest heating have been repeatedly shown to produce substantial biological effects.*

What Dr. Pall concludes in his paper is that the way that exposure to electromagnetic radiation has a physiological effect is through the disruption of calcium channels in cells.

# Calcium Channels

A calcium channel is a molecule that permits or prevents the passage of a calcium ion from the outside to the inside of a cell. Once inside the cell, the calcium ion stimulates the cell's chemistry to perform such tasks as making proteins, contracting muscles, releasing hormones, and firing neurons. Virtually every cell in the body uses calcium channels to respond to biological signals.

The important thing to understand is that the calcium ion does what it does because it is electrically charged—which means both it and its channel respond to electromagnetic fields. So if an electromagnetic field opens the channel, calcium ions flood into the cell and start doing what they do.

Dr. Pall's paper reviews studies in which EMF exposure produces biological effects that can be blocked by using calcium channel blockers, drugs that block the action of what's known as "voltage-gated calcium channels" (VGCCs).

What these studies show is that electromagnetic exposure acts by partially depolarizing the electrical charge across the plasma membrane of cells, activating the VGCCs; and it is the increased intracellular calcium levels that are responsible for the physiological reaction to electromagnetic exposure.

## Significance of the Paper

Martin Pall's paper is important in two ways:

1. There have been many claims that physiological effects of electromagnetic exposure can't possibly exist because there's been no known plausible mechanism of action of such exposure that could produce such effects. Clearly these claims are now irrelevant.
2. In future studies aimed at understanding the mechanisms of EMF exposure, scientists now know where to look.

Significantly, it is probable that this review is very much a "game changer"; it alters the whole question of whether EMFs actually can cause biological effects—a question that has been fraught with substantial confusion—into one in which specific, targeted questions can now be asked and answered experimentally.