Metabolic Solutions Report
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How Fluoride Kills Human Cells

Researchers uncovering mechanisms behind fluoride's toxicity

Fluoride, the "Golden Child" of dental professionals around the world, seems to have a "dark side" that few outside a very specialized field of the scientific community are aware of. As disturbing as it may be, fluoride apparently has the ability to cause DNA damage and even "cell death" in human cells.

In a new study, researchers from the National Institute for Environmental Studies in Japan note that "Even though fluoride toxicity is increasingly being considered to be important, very little information is available on the mechanism of action of fluoride."

You might think that most everything would be known about a chemical that is being added to our water and prescribed for our children, but regrettably this is not the case.

Researchers decided to investigate the mechanism by which fluoride's is able to kill cells by observing how it affects human leukemia cells. Cancerous cells are often used in research on toxicity because they are more active than normal cells.

They found that the fluoride induced a form of cell death known as "apoptosis" in a dose-dependent and time dependent manner.

Now, if fluoride killing cancerous cells were the "end of the story", this would be a great breakthrough in cancer treatment and would likely save many lives. Unfortunately, things are not quite so simple.

Lead researcher Dr. C.D. Anuradha, in comments to the Optimal Wellness Center, explains that "fluoride in general is harmful to any type of cell. We have seen that fluoride causes cell death in other non-cancerous cells but however the mode of death has been found to be different." Instead of causing apoptosis, in normal cells fluoride seems to kill cells through a different mechanism, known as "necrosis".

Cell Death - Murder or Suicide?

Apoptosis, also known as "programmed cell death" in a process governed by genes in which the cell dies from within upon activation by some stimulating factor. It is a useful phenomenon, which occurs often as part of the normal functioning of the human body, as it gets rid of unwanted cells. The term apoptosis is derived from the Greek word that signifies "the dropping of leaves from the trees." The falling leaves are no longer needed, just as is the case with the unwanted cells, so they are gotten rid of, and recycled back into the earth.

Necrosis, on the other hand, is an externally influenced death, which occurs through some type of local injury (as loss of blood supply, corrosion, burning, or the local lesion of a disease).

A useful analogy between apoptosis and necrosis might be to compare suicide (apoptosis) to murder (necrosis).

Is it Dangerous at Much Lower Doses?

Now many readers may ask the intelligent question of - How does this affect me? Are the much lower concentrations found in fluoridated water and toothpaste a danger to my family and me?

The answer unfortunately is that nobody knows for sure. However, Dr. Anuradha states that, although the concentrations are quite low "…still we expect some amount of damage even at lower concentrations, since at higher concentrations the results are quite clear that the difference is enormous and significant."

She notes that the issue of therapeutic fluoridation is the subject of much debate. Could this be the reason that Japan does not fluoridate ANY of its water supplies? This can't be said with certainty, but after all, doesn't it make sense to keep a potentially dangerous substance out of the water and not FORCE the entire population to consume it?

In the United States currently about 60% of the population drinks fluoridated water, although if the federal government has its way, that percentage will rise dramatically. This is especially true with states like California MANDATING the fluoridation of the public water supplies over a certain size.

How it Caused Cell-Death

Dr. Anuradha and colleagues found that fluoride caused apoptosis in the human leukemia cells by activating an enzyme called caspase-3, which has been identified as a key mediator of apoptosis of cells in humans and other mammals.

The authors note that "The results clearly suggest that fluoride causes cell death in HL-60 (human leukemia) cells by causing the activation of caspase-3 which in turn cleaves PARP leading to DNA damage and ultimately cell death."

What Type of Fluoride?

Except for readers with strong scientific backgrounds, most people don't realize that there is really no such thing as plain "fluoride". When it said that "fluoride" is added to the water, in reality it is a fluoride-compound such as sodium fluoride (NaF), which is the form used in these toxicity experiments.

While this may be the most well known and well-studied of all the fluoride compounds, it is actually very rarely used for water fluoridation. In over 90% of the fluoridated water in the US, the chemicals used are one of the silicofluorides (either fluosilicic acid or sodium silicofluoride).

However, these chemicals have been shown to act much differently from the much simpler sodium fluoride. In one study, it was shown that these chemicals enhance the cellular uptake of lead (http://www.fluoride-journal.com/98-31-3/313-s25.htm).

Being that there is evidence that silicofluorides may be even more toxic than NaF, it is quite possible that the DNA damage and cell-killing ability might be even greater in the type of fluoride used in the water supplies.