

Comments on Notice of Inquiry, ET Docket No. 13-84

Submitted by Nancy Naylor 9/2/2013

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I am writing to express my concern over the current exposure guidelines for radio frequency and microwave radiation. I am hopeful that these guidelines will soon change in favor of protecting the American population. I feel passionately about this because my daughter has autism. I was unaware of the effect that the RF/MW that was constantly around her could have. I have since found that many of the biological effects of wireless radiation are very similar to the biological markers found in people with autism. The table below outlines these similarities. The studies references are listed at the end of this letter.

Non-ionizing Microwave Radiation	Autism Spectrum Disorder
Leaking Calcium Ions Hypocalcemia (Goldsworthy 2007) [1]	Boys with autism and autism-spectrum-disorder (ASD) are at higher than normal risk for thinner, less dense bones when compared to a group of boys the same age who do not have autism. (NICHD 2008) [2] It has been speculated that this is due to the casein-free diet that many ASD children are put on; however, this has not been speculation at this point.
Weakened Blood-Brain-Barrier (Salford 2007) [3]	Peptide molecules, which come from the proteins of gluten and casein products, result in opioid activity in the brain because they pass into the brain via an opened blood-brain-barrier. (Shattock 1991) [4] This also may explain how the toxins in the

	environment (or injected into the blood stream) may pass through the blood-brain-barrier and affect the child's nervous system.
DNA damage – increase in the single- and double-strand breaks of DNA (Lai, 1994) [5]	DNA damage and genetic mutations carry a substantial susceptibility to autism. (Weiss, 2008) [6]
Impairment of the immune system (Johansson, 2009) [7]	Antibodies found in the blood of autistic children suggest an abnormal immune response is common. (Stern, 2005)[8]
Decrease in the production of melatonin (Arnetz, 2007)[9]	Biochemical analyses performed on blood platelets and/or cultured cells revealed a highly significant decrease in melatonin level ($P=3 \times 10^{-11}$) in individuals with ASD. (Melke, 2008) [10]
Increase in apoptosis (Joubert, 2008) [11]	Studies indicate that the autistic cerebellum may be vulnerable to pro-apoptotic stimuli and to neuronal atrophy as a consequence of decreased Bcl-2 levels. (Fatemi, 2003) [12]
Decrease in levels of glutathione (Mittur 2000) [13]	Studies have shown levels of the antioxidant glutathione are typically about

	<p>50 percent lower in children with autism. (Kern 2006) [14]</p>
<p>Increased oxidative stress (Adey 1993) [15]</p>	<p>Convincing data demonstrate greater oxidative stress in groups of children with autism, as compared to controls. Oxidized biomolecules in blood (lipid peroxides in both red-cells and serum) and urine (isoprostanes) are significantly elevated in autism. The autistic brain has significantly increased levels of lipofuscin after age seven, and a more specific oxidative marker is found in cortical dendrites in even younger subjects. (McGinnis 2005) [16]</p>
<p>Mitochondria Dysfunction has been shown to be induced by exposure to microwave radiation. (Schmitz 2004) [17]</p>	<p>Biomarkers for mitochondrial dysfunction have been identified in many cases of autism and are believed to contribute to diagnostic symptoms including: cognitive impairment, language deficits, abnormal energy metabolism, and chronic gastrointestinal problems. (Rossignol, 2011) [18]</p>
<p>Electromagnetic fields – like those emitted by cell phones – have been shown to alter regional cerebral blood</p>	<p>In conditions like autism and chronic fatigue syndrome (CFS) it has been shown via SPECT (Single Photon Emission Computed</p>

<p>flow. (Huber 2005) [19]</p>	<p>Tomography) scans that there is a decreased flow of blood to the brain. (Gillberg, 1993) [20]</p>
<p>EMF produces pronounced changes in the molecular structure of hemoglobin and induced force acting on the charged particle of charge which may activate rouleau formation (an aggregation of red blood cells in a roll formation.) (Baieth 2008) [21]</p>	<p>Thrombophilia, a coagulation disorder, was found in 70% of the children with autism, and in many of the parents. (Bradstreet 2001) [22]</p>
<p>Reduced dopamine levels in PC12 cells exposed to low frequency electromagnetic fields (Opler 1997) [23]</p>	<p>Plasma and urine concentrations of homovanillic acid, a dopamine metabolite, have been reported abnormal in those with autism. (Ernst 1997) [24]</p>
<p>Wireless radiation leads to deaminization of amino-acids and thereby causes disturbance of ammonia utilization by the body. (Tamasidze 2007) [25]</p>	<p>Elevated ammonia is common in autism. A study of 65 children with autism found that 70% had levels above the reference range of the lab. (Bradstreet 2001) [22]</p>
<p>In an experiment on rats the concentration of serotonin was elevated in the hypothalamus of male rats after 1 month of EMF exposure. (Chance 1995)</p>	<p>Whole blood serotonin concentration were found to be significantly higher in drug-free autistics that in typical persons. (Anderson</p>

[26]	2006) [27]
In a Russian study of workers exposed to HF and microwave range (3 and 10 cm) EMF, the incidence of gastrointestinal tract diseases significantly increased with the increase of EMR exposure duration. (Nikitina, 2000) [28]	There is a high prevalence of gastrointestinal symptoms in children with autistic spectrum disorder. (Horvath 2002) [29]

We do not know with certainty if RF/MW exposure is the cause of her autism, but with a growing incidence of autism in children and no answers as to why it is growing so quickly, we should be proceeding with caution. The next generation depends on us. There is significant research here for us to be concerned. Implementing better guidelines will help us use modern technology while minimizing the effects on human health.

Guidelines for power density values should be based on RF/MW exposure guidelines that protect from nonthermal health effects. Current guidelines only allege to protect for thermal heating. FCC's power density value should be lowered from 1,000 uW/cm² to 0.0003 uW/cm².

Ref. THE BIOINITIATIVE REPORT 2012 A Rationale for Biologically-based Public Exposure Standards for Electromagnetic Fields (ELF and RF) <http://www.bioinitiative.org/>

Regulations should use only electric field based power density values for the RF/MW exposure standards and stop using Specific Absorption Rate(SAR) which only measures heating effect.

Moreover, safety standards need to be more conservative for special populations, including pregnant women, children the elderly and people with illness or autoimmune conditions.

THE BIOINITIATIVE REPORT 2012 A Rationale for Biologically-based Public Exposure Standards for Electromagnetic Fields (ELF and RF)

<http://www.bioinitiative.org/>

and Evaluation of Specific Absorption Rate as a Dosimetric Quantity for Electromagnetic Fields Bioeffects <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0062663>

The EPA must continue its non ionizing radiation protection research program for developing safe RF/MW exposure guidelines. The FCC is charged with promoting wireless technologies. The FCC cannot be objective when setting regulation standards of RF/MW radiation. Furthermore, only a health agency (which the FCC is not) has the expertise to evaluate the science on RF/MW exposure.

It is irresponsible to encourage and facilitate the expansion of Wi-fi and other wireless radiation which results in the involuntary exposure to RF/MW. The research is showing us that there are health effects. People should not be required to be exposed for RF/MW just to get an education or live in a community. Our regulations should give weight to science and the precautionary principle.

Sincerely,

Nancy Naylor

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