

PLEASE SEE RELATED MAPS:

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- [TINNITUS](#)
- [INSOMNIA](#)
- [MELATONIN](#)
- [EEG AND EMF](#)
- [EMF AND THINKING](#)
- [MEMORY PROBLEMS](#)
- [ALZHEIMER'S DISEASE](#)
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- ★ [EMF AND BLOOD BRAIN BARRIER](#)

INDEX (PDF) OF ALL MAPS RELATED TO EMF AND THE BRAIN

EMF AND THE BRAIN:

- Cognitive, processing problems*
- Mood and behavior problems*
- Benign tumors*
- Malignant tumors*
- Tinnitus and sensory problems*
- Memory difficulties*
- Neurodevelopmental problems*
- Neuroinflammatory problems*
- Blood flow alternations*
- Melatonin and sleep problems*

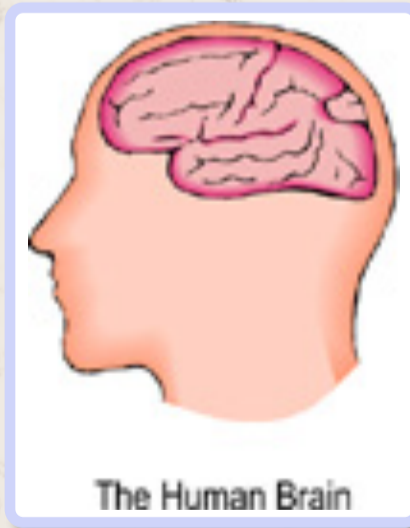
- [MW genotoxic, rat brains](#)
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Mix of effects

- [Prefrontal blood flow](#)
- [Reduced local blood flow](#)
- [Blood-brain barrier leakage](#)
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- [Focal barrier disruption, pulsed HF EMF](#)
- [RF, changed local blood flow, temperature](#)

★ [Barrier disruption, neurodegeneration, cell phones](#)



The Human Brain

Blood flow and barrier

- [Genetic effects](#)
- ★ [MW, dendritic spines shrink, hippocampus](#)
- [Whole body exposure, rat, adult neurogenesis](#)
- ★ [MW, changes in synaptic vesicles, numbers, size](#)
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BRAIN THERMAL EFFECTS AND DISTANCE FROM PHONE

- ★ [ELF, lipid profile changes, physiologic stress](#)

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THE BIOINITIATIVE 2012

- [Autistic Spectrum](#)
- [Neurology and Behavior](#)
- [Brain Tumors, Dr. Hardell](#)
- [Melatonin, Alzheimer's Disease](#)
- ★ [2017 Supplement: Brain Tumor Risk](#)
- [Changes in brain activity](#)
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Metabolic functions



BRAIN THERMAL EFFECTS AND DISTANCE FROM PHONE

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Genetic effects

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★ [Barrier disruption, neurodegeneration, cell phones](#)

Central nervous system diseases

- [Epilepsy](#)
- [Parkinson's disease](#)
- [Increased dementia](#)
- [Alzheimer's disease](#)
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- [Extensive neurodegeneration](#)
- [CFAP expression altered, gliosis](#)
- [Neurotoxicity, inflammation, EMF](#)
- [EMF one factor, rise neurodegeneration](#)

MULTIPLE BRAIN EFFECTS OF EMF

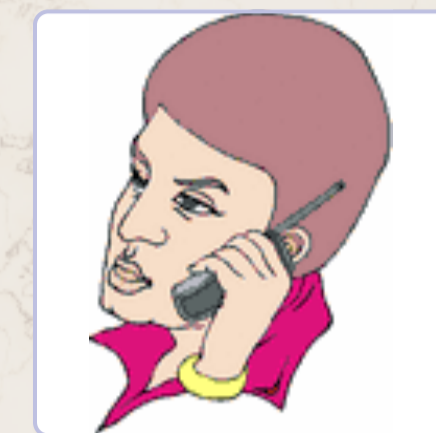
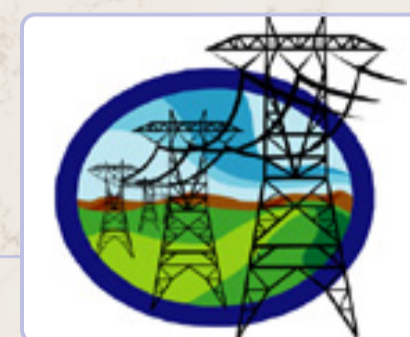


Neurosensory systems

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Mood/behavior

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- [Bavarian children, behavior problems](#)
- [Neurobehavioral problems, tower, Latvia](#)
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- [MW, anxiety and depression behavior, mice](#)
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- ★ [MW, rats, behavior, anxiety, learning changes](#)
- [MW, widespread psychiatric effects, depression](#)
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Tumors

- [Glioma](#)
- [Astrocytoma](#)
- [New EU study](#)
- [A Child's Brain](#)
- [Acoustic neuroma](#)
- [ELF, cancer promoter](#)
- [Glioma, temporal lobe](#)
- [Glioma, acoustic neuroma](#)
- ★ [Double brain cancer risk](#)
- [Occupational powerline exposure](#)
- ★ [NTP Report, increased glioma](#)
- ★ [MetaAnalysis, glioma, wireless phones](#)
- [Electrical appliance use, adult brain tumors](#)
- [25 year latency, brain tumors, cell phones](#)
- [Study, number of cell phone contracts, tumors](#)
- [Long term cell phone use increases tumor risk](#)
- [Study, deceased mobile phone users, controls](#)
- [Study on tumor promotion vs. tumor causation](#)
- [Mobile phone, case studies, glioma, temporal lobe](#)
- [Mobile and cordless phone risks, glioma since 1965](#)
- [Mobile phone use, intracranial tumors, meta-analysis](#)
- ★ [CERENAT study, more risk in heavy, chronic users](#)
- [Rising brain tumor rates in US, cell and cordless phones](#)
- [Increased risk of tumors, 290%, after 10 years cellphone use.](#)

NON-IONIZING ELECTROMAGNETIC FIELDS: EFFECTS ON THE BRAIN



Neural architecture

Glia

- [Receptor changes](#)
- [Hippocampal neurogenesis](#)
- [Hippocampal neuron density](#)
- [Brain weight affected, young](#)
- [Rates, cerebellar morphology](#)
- [Serotonin receptor deformation](#)
- [RF, structural hippocampal changes](#)
- [MW exposure impairs synaptic plasticity](#)

Neuroprocessing

- [Gender related changes](#)
- [Pain response changes](#)
- [Ion channel transduction](#)

- ★ [Wi-Fi, microRNA expression](#)
- [Increased excitation/facilitation](#)
- ★ [Nonlinear sensory transduction](#)
- [Decreased cytochrome c oxidase](#)
- [Attentional changes, gender, W-Fi](#)
- [Change in motor evoked potentials](#)
- [Induction of stochastic resonance](#)

- [Upregulation calcium channel function](#)
- [Audio: Brain changes from electronics](#)
- [Electrical fields, polarization of neurons](#)
- [Dirty electricity, stress, neurotransmitters](#)
- [Osmolarity affects threshold field effects](#)

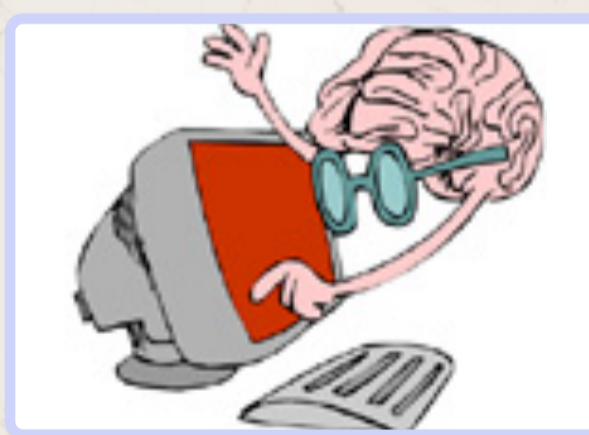
4G, cell phones, 30 minutes, neuroprocessing

"Undeniable effects", EMF "maestro" to neurons

★ MW, hippocampus, genetic expression, "omics"

Cognition

- [Attention, memory](#)
- [Impaired cognition](#)
- ["Digital Dementia"](#)
- [Attention, reaction time](#)
- [Rumination, vulnerability](#)
- [Executive function changes](#)
- [Faster, less accurate learning](#)
- [Cognitive neurogenotoxic, MW](#)
- [Wi-Fi and memory, cognitive tasks](#)
- [Alteration of cognition, 5-HTP, MW](#)
- [Children, cellphones, ADHD increase](#)
- [Mobile phones, cognitive changes, youth](#)
- [Low level MW, cognitive changes, DNA damage](#)



OVERVIEW OF NEUROLOGIC EFFECTS

DR. JOEL MOSKOWITZ: EMF AND BRAIN CANCER

Home: [Oscillatorium](#)
Newest version *this map*
Date of this update: 10-07-18



Oxidative damage

- [Mitochondrial DNA](#)
- [Antioxidant depletion](#)
- [Brain oxidative damage](#)
- [Beware your cell phone](#)
- [Oxidative damage, 900 MHz, rat](#)
- [Oxidative damage, 950 MHz, rat](#)
- [Cellphones, Wi-Fi, oxidative stress](#)
- [Low intensity MW, oxi. stress, rat brain](#)
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- [Neurotoxicity, mitochondria, oxidation, brain](#)
- [EMF, ringtone, vibration, each produce oxi. stress](#)

BRAIN TISSUE DEHYDRATION

FMRI: DEFAULT MODE NETWORK HYPERCONNECTIVITY IN EHS

NTP: DON'T BELIEVE THE HYPE

HIGH QUALITY STUDIES INDICATE TUMOR RISK

NMR, CELL PHONE BRAIN RADIATION ABSORPTION