

# The Consequences of One Century of Increasing Exposures to Electromagnetic Radiation: links to Autism



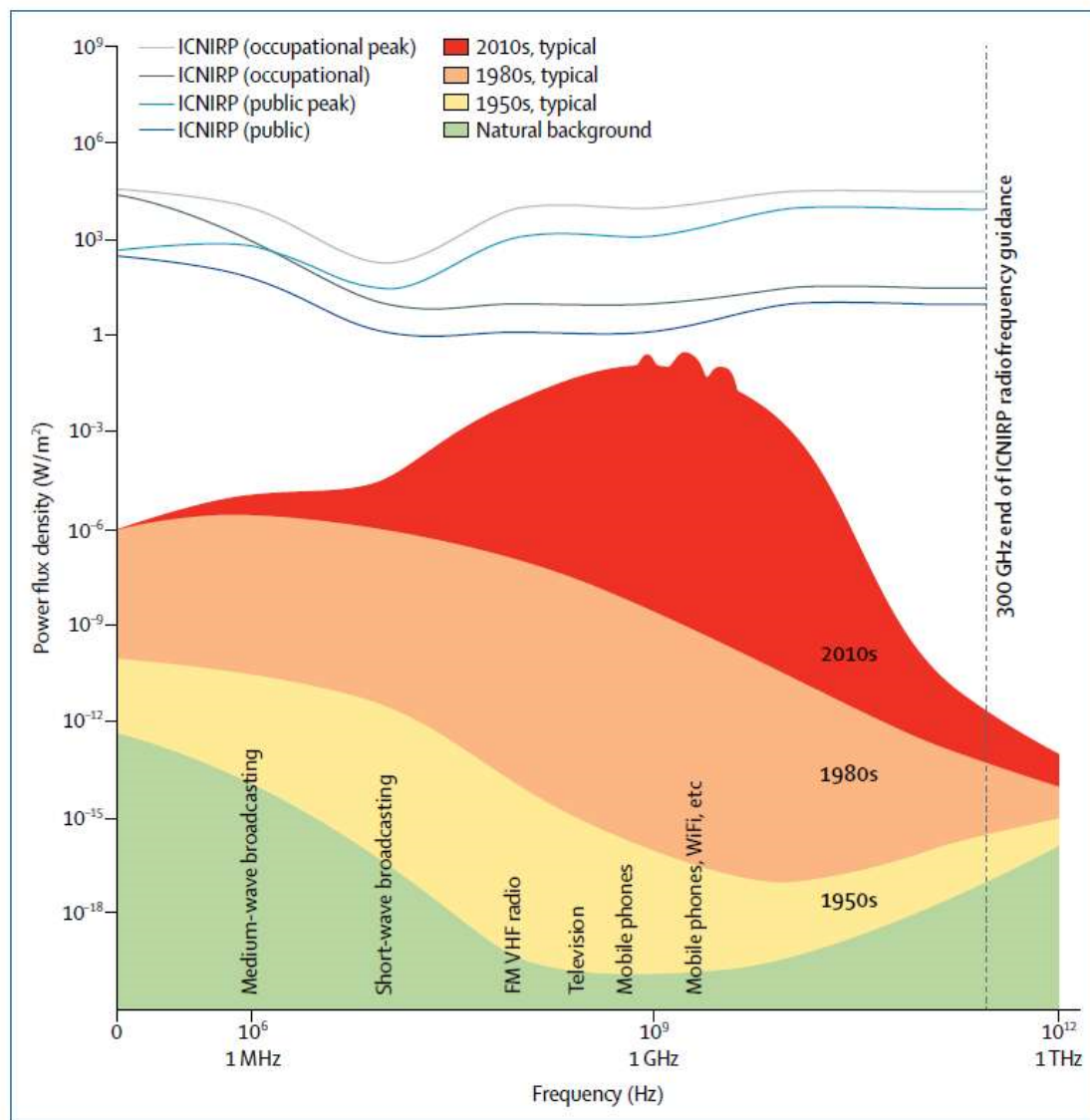
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## ABSTRACT

Our environment has shifted drastically over the last century without our noticing. The agent is invisible and, for most of us, imperceptible. But its effects are easily shown in the laboratory. To see them, we return human cells to the year 1900 environment, a condition which I call "pre-industrial", by eliminating all human made electromagnetic fields. If this is done, simple experiments show major disturbances to the behavior of cancer cells, suggesting carcinogenicity, as well as changes in the pattern of death in cells, indicating that the fields are more aggressive towards the body than the well-know Reactive Oxygen Species (ROS). This has gone un-noticed because the agent is invisible, and has been increased progressively over time. Also, power and telecommunications industries have created a powerful lobby dedicated to ignoring science. This in a context where alternative techniques could now be used to eliminate the sanitary effects of this radiation, while maintaining and improving function. But certain industrial communities would have to accept change. I am disturbed by the electromagnetic radiation of my 6-year old daughter in school, subjected to levels from a router above her head that was considered acceptable by the US military in the context of war.



**Figure:** Typical maximum daily exposure to radiofrequency electromagnetic radiation from man-made and natural power flux densities in comparison with International Commission on Non-Ionizing Radiation Protection safety guidelines<sup>1</sup>

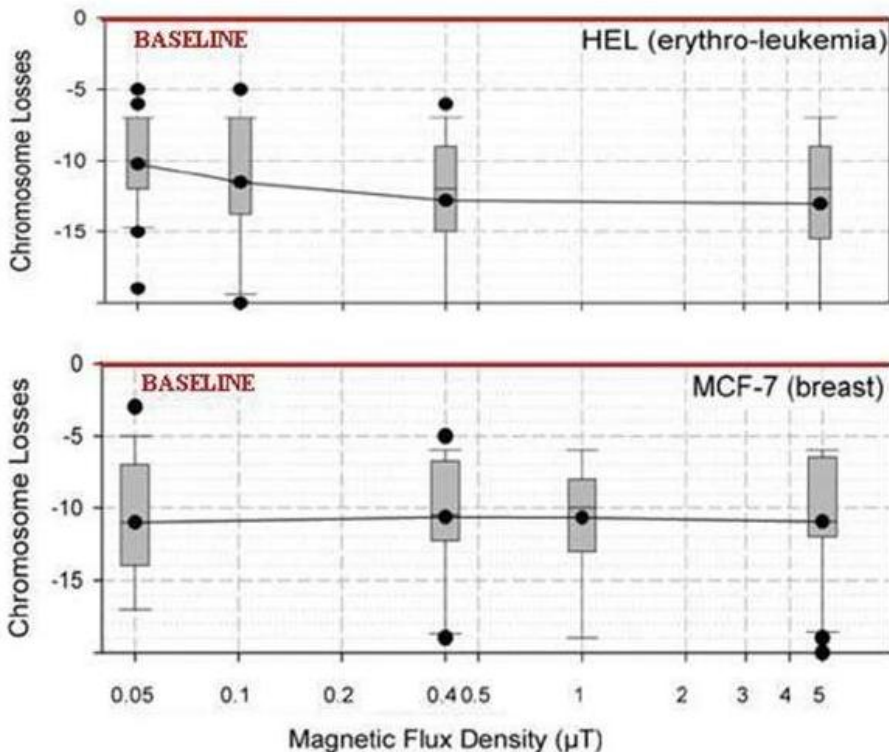
Anthropogenic radiofrequency electromagnetic radiation levels are illustrated for different periods in the evolution of wireless communication technologies. These exposure levels are frequently experienced daily by people using various wireless devices. The levels are instantaneous and not time-averaged over 6 minutes as specified by International Commission on Non-Ionizing Radiation Protection for thermal reasons. Figure modified from Philips and Lamburn<sup>12</sup> with permission. Natural levels of radiofrequency electromagnetic radiation were based on the NASA review report CR-166661.<sup>13</sup>



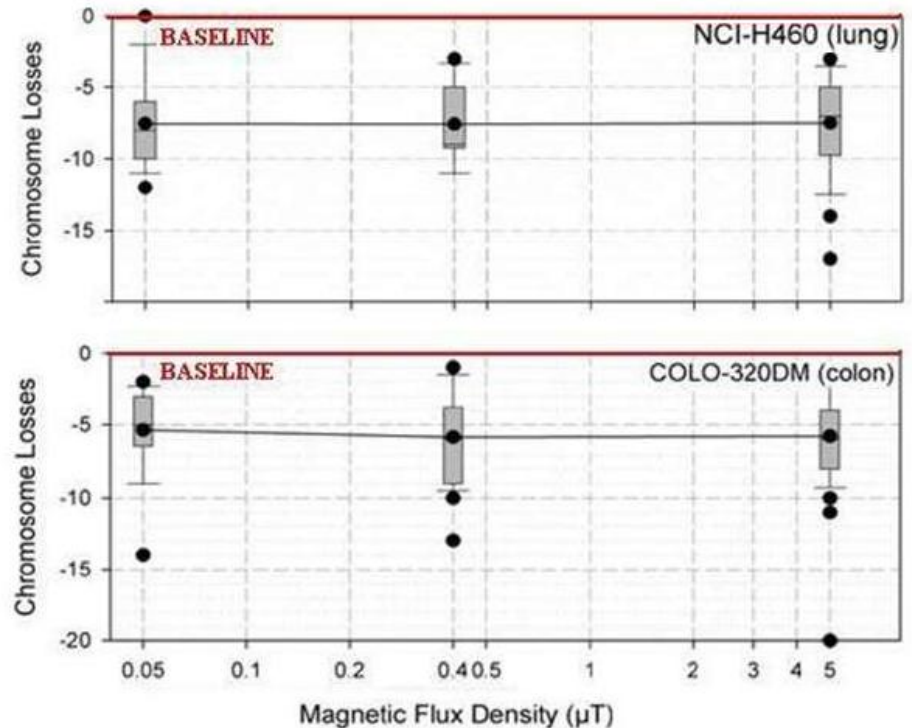
# Extra-low-frequency magnetic fields alter cancer cells through metabolic restriction

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DOMESTIC  
COMMERCIAL  
OCCUPATIONAL



DOMESTIC  
COMMERCIAL  
OCCUPATIONAL



# Magnetic Fields Trump Oxygen in Controlling the Death of Erythro-Leukemia Cells

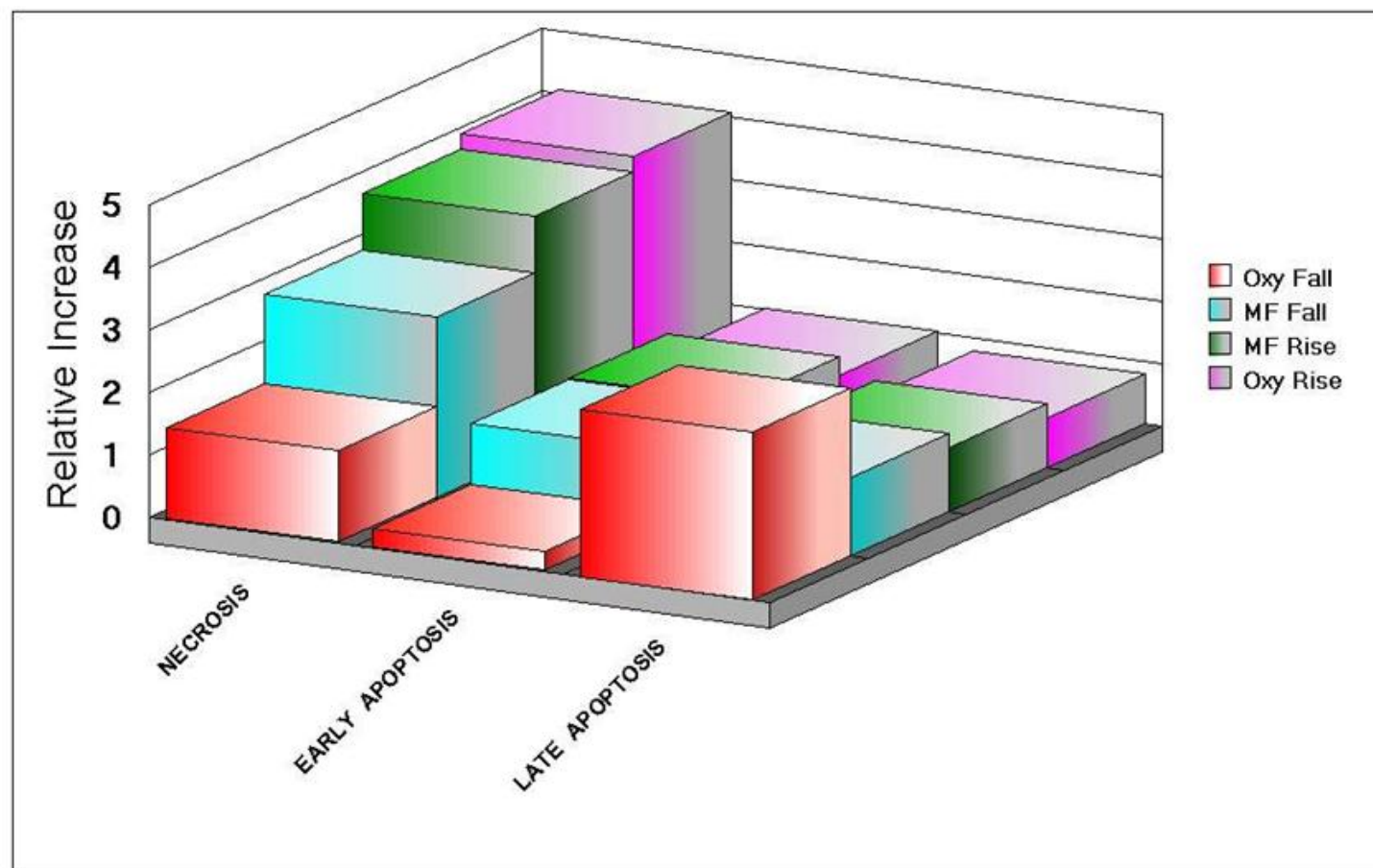
Ying Li<sup>1</sup> and Paul Héroux<sup>2,\*</sup>

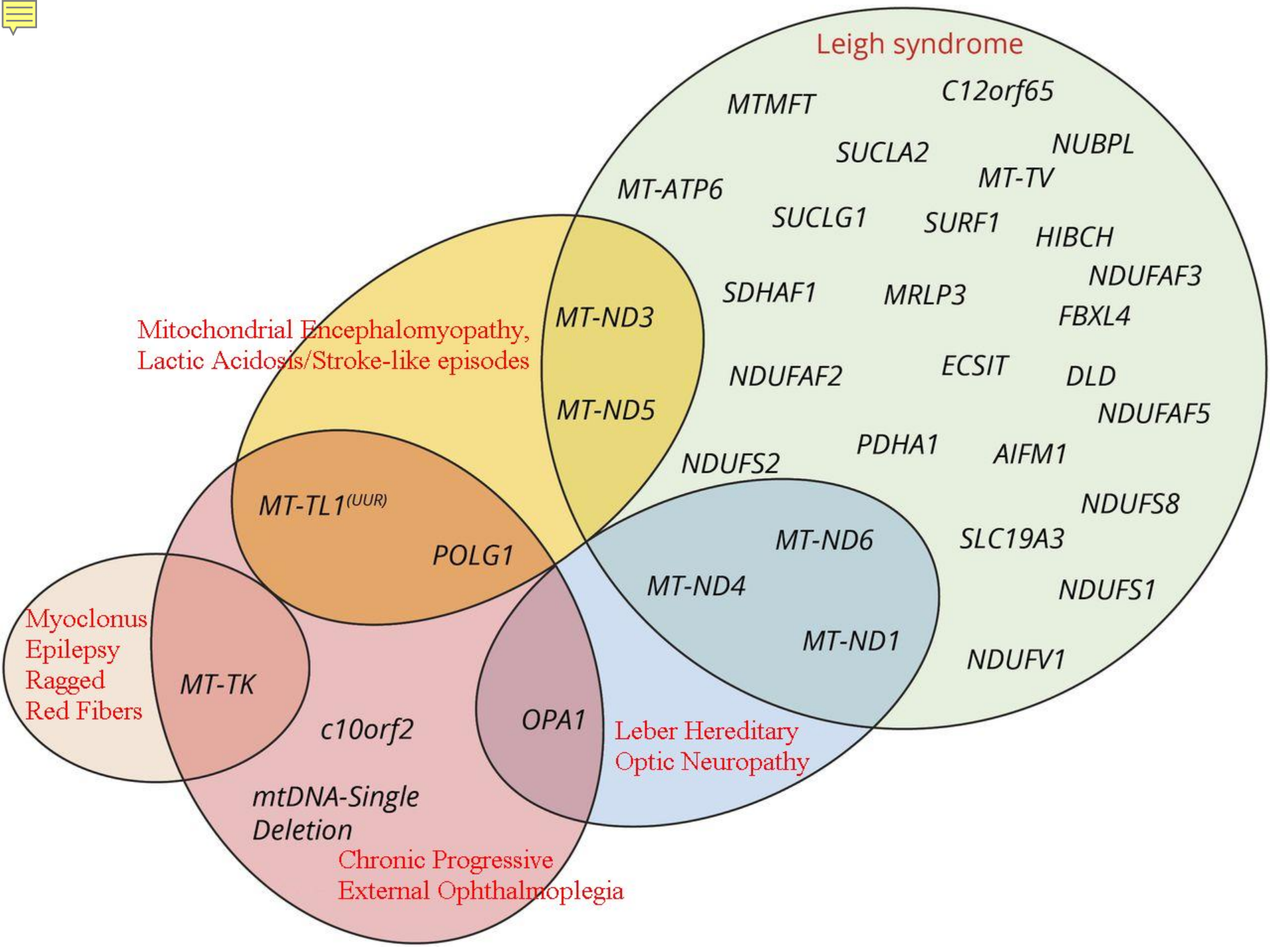
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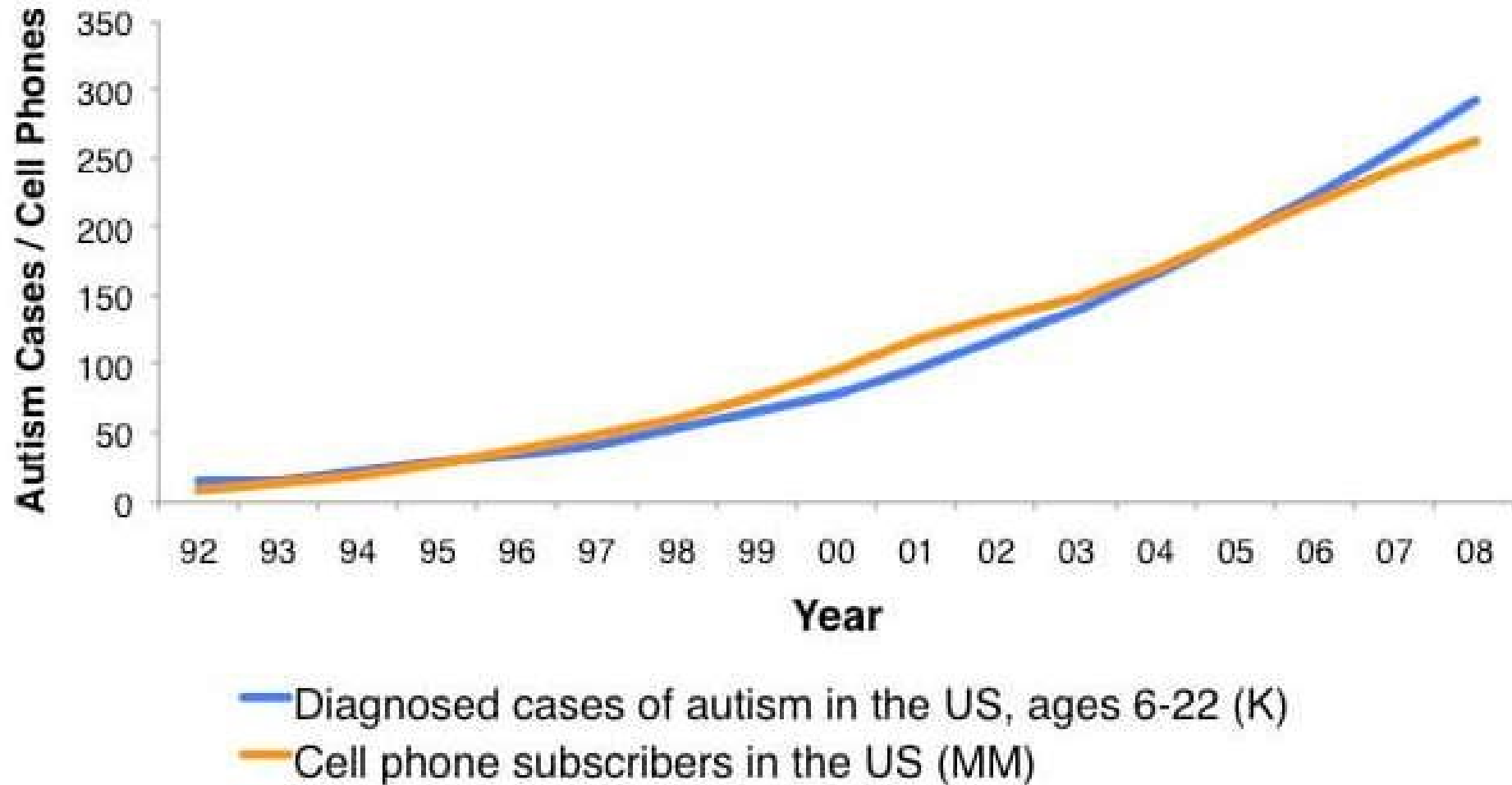
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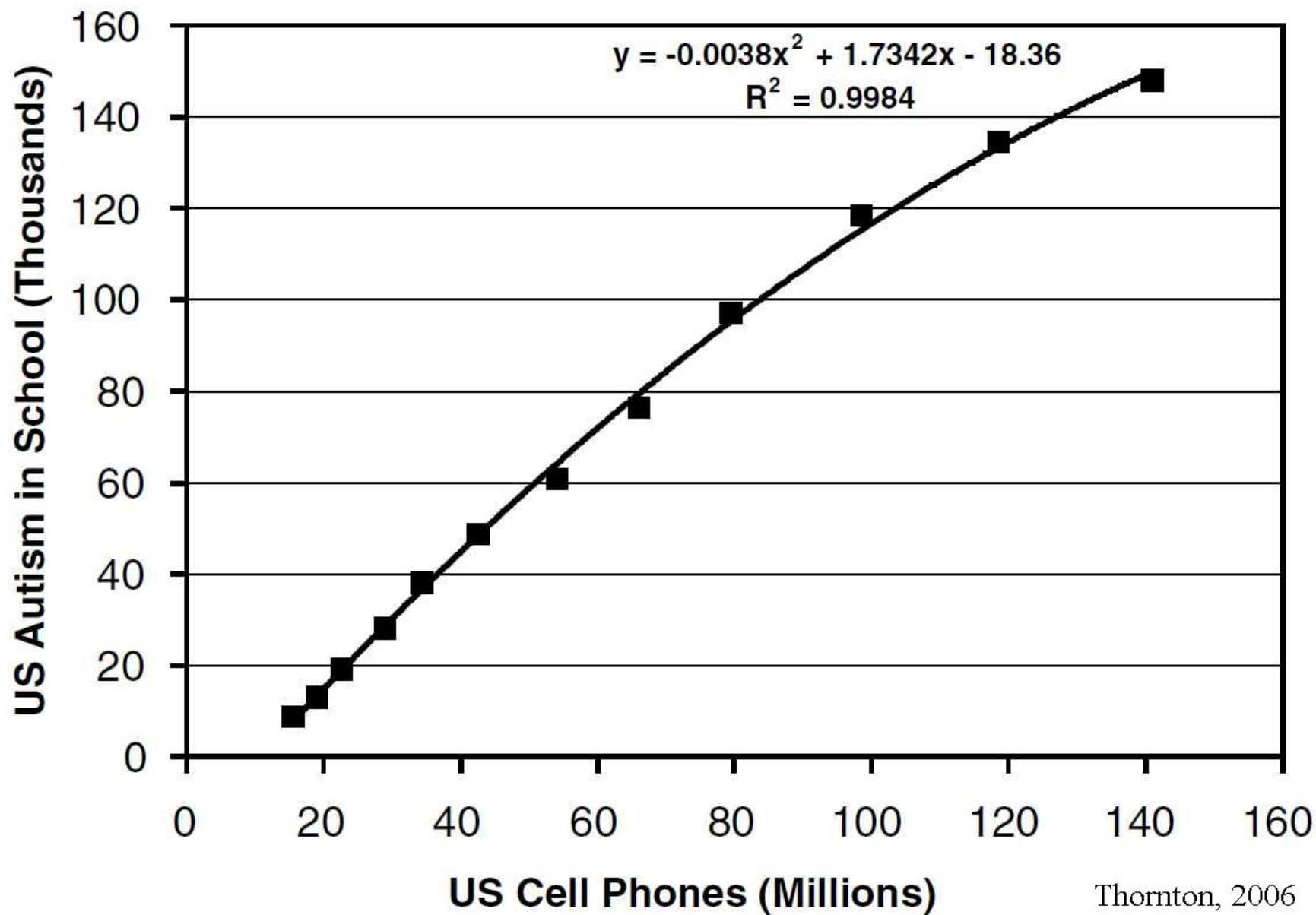






## Trends in Autism and Cell Phones

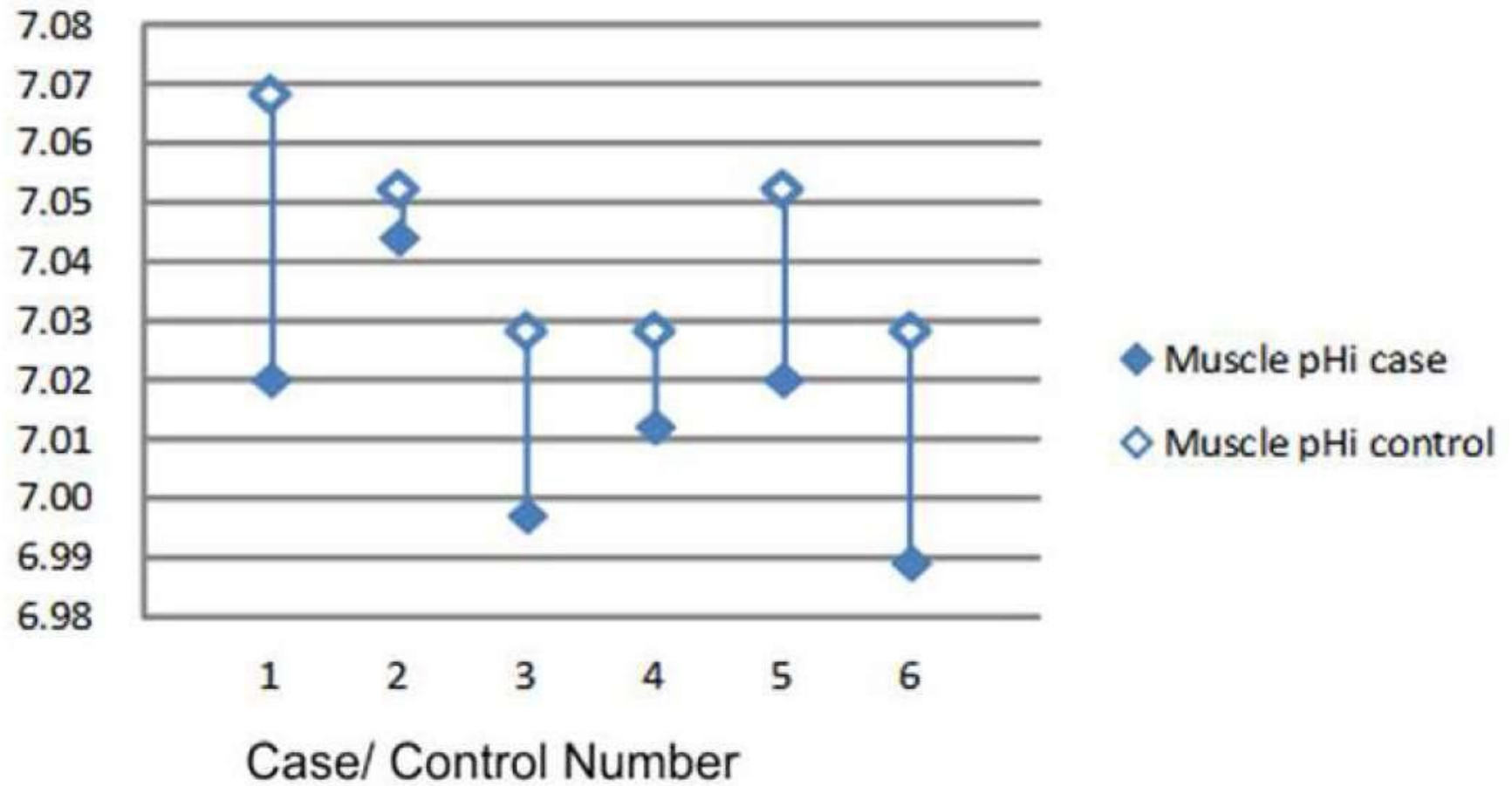




Thornton, 2006



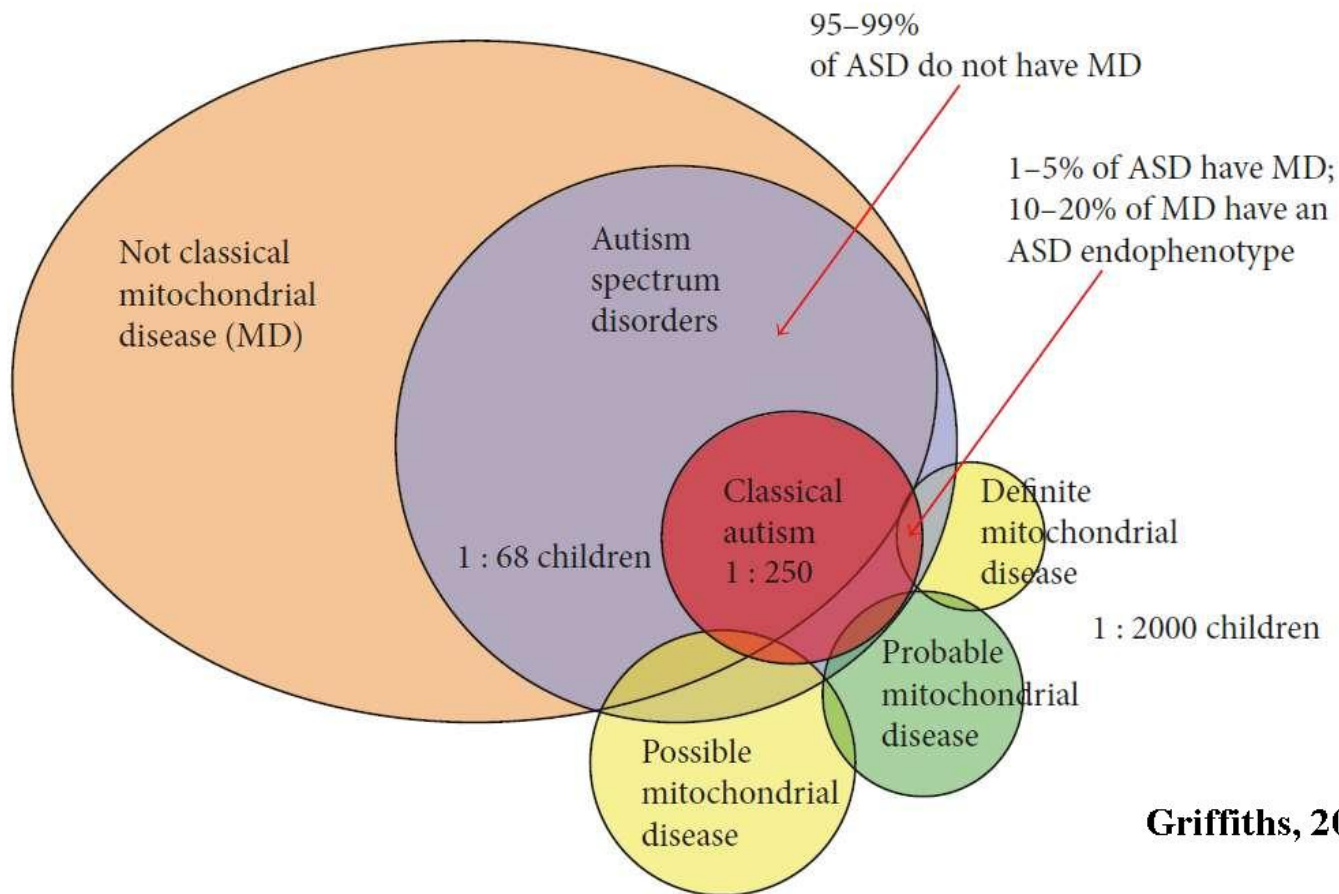
## Muscle pHi



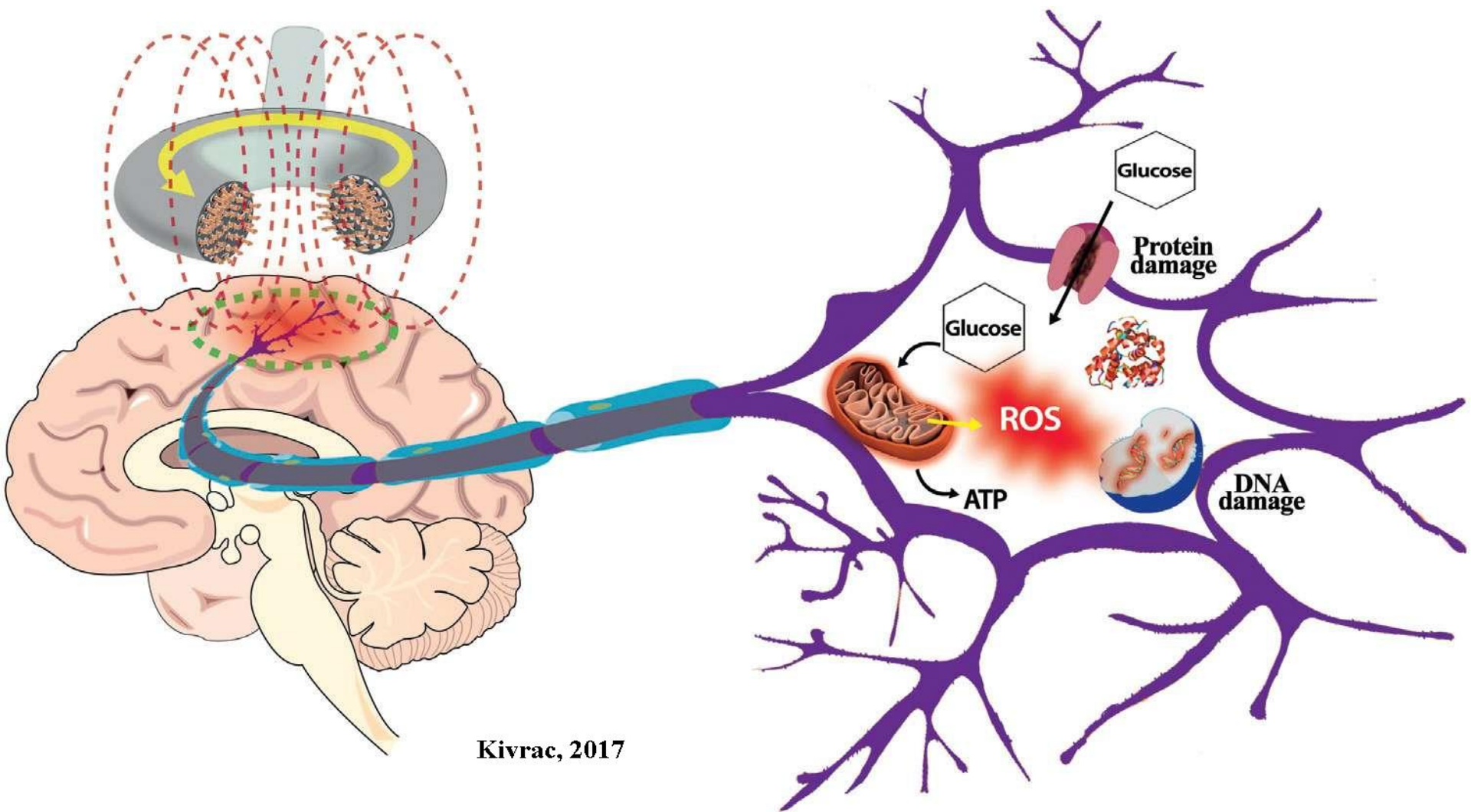


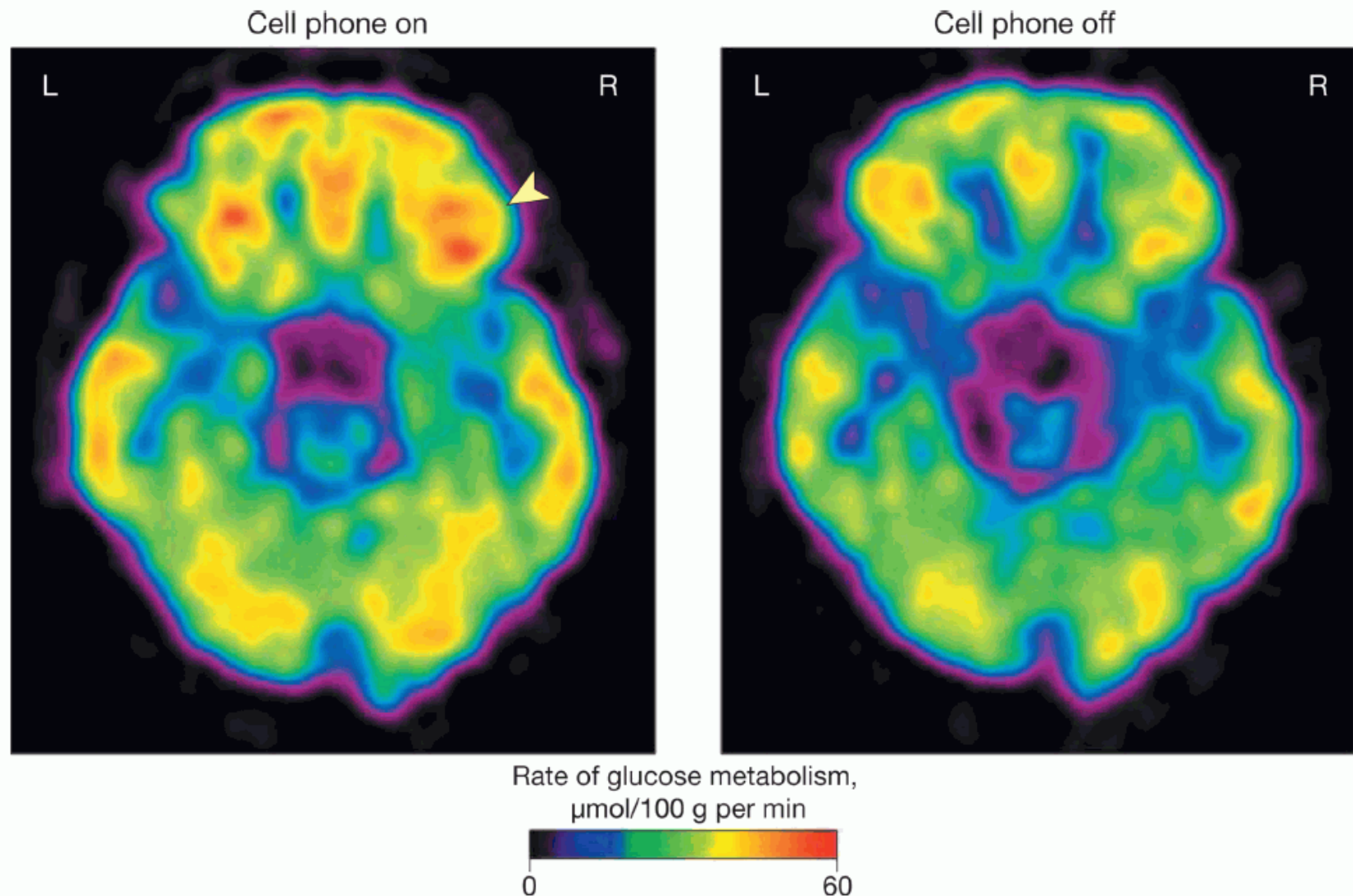


## Oxidative Medicine and Cellular Longevity



**Griffiths, 2017**



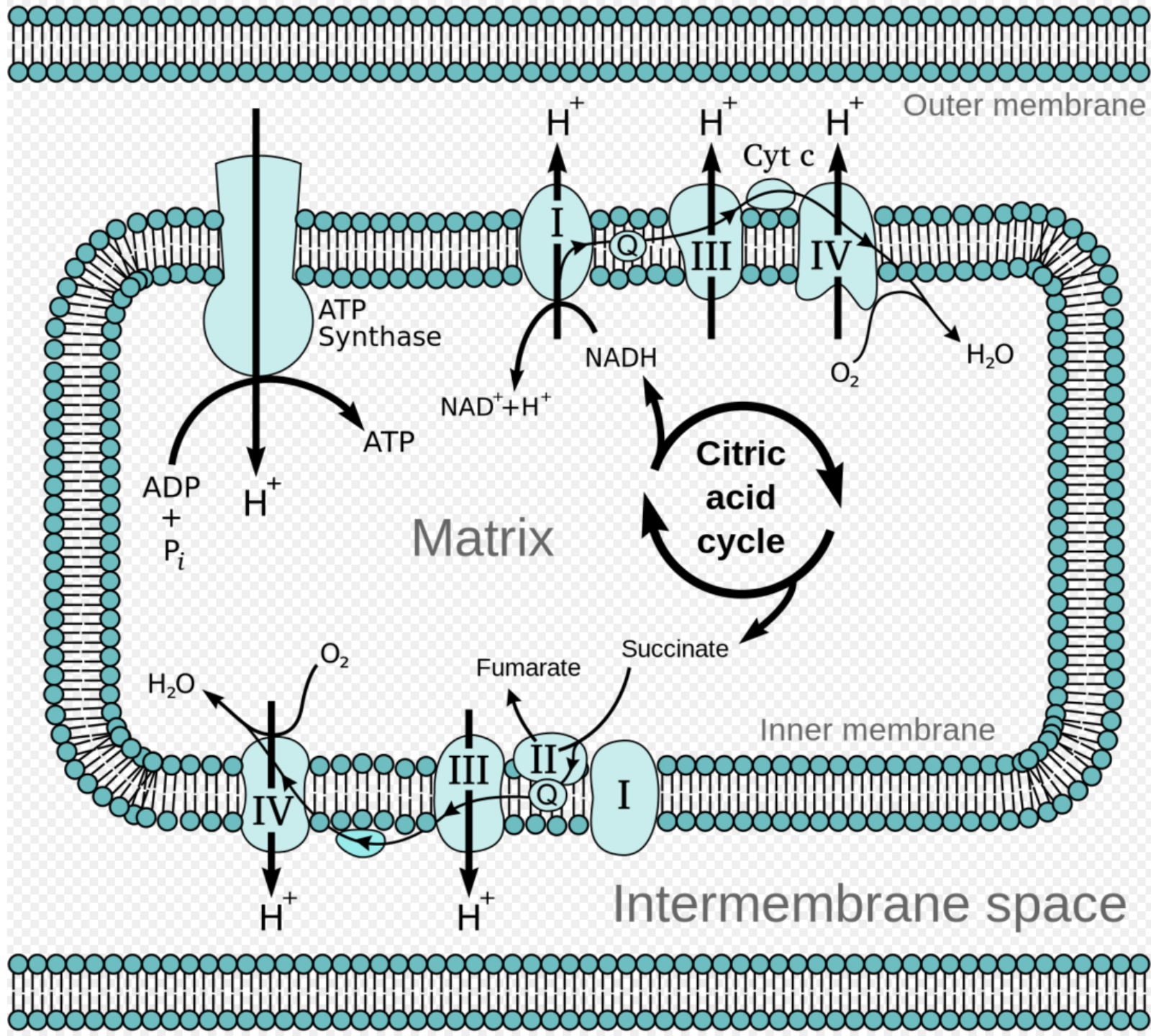


### NUCLEAR MAGNETIC RESONANCE SHOWS EFFECTS ON THE BRAIN BELOW FCC LIMITS

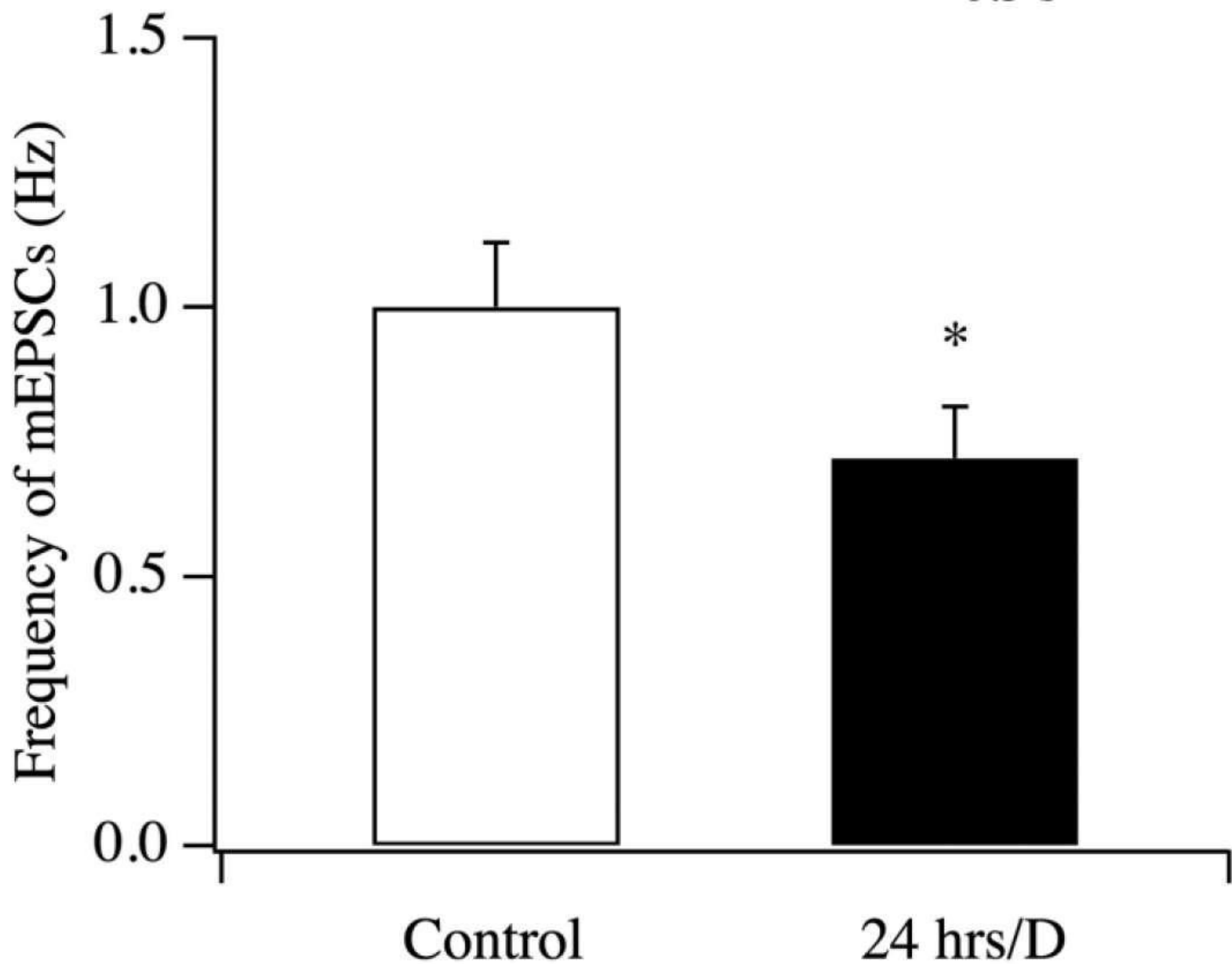
**Figure 2. Brain Glucose Metabolic Images Showing Axial Planes at the Level of the Orbitofrontal Cortex**

Images are from a single participant representative of the study population. Glucose metabolism in right orbitofrontal cortex (arrowhead) was higher for the “on” than for the “off” condition (see “Methods” for description of conditions).

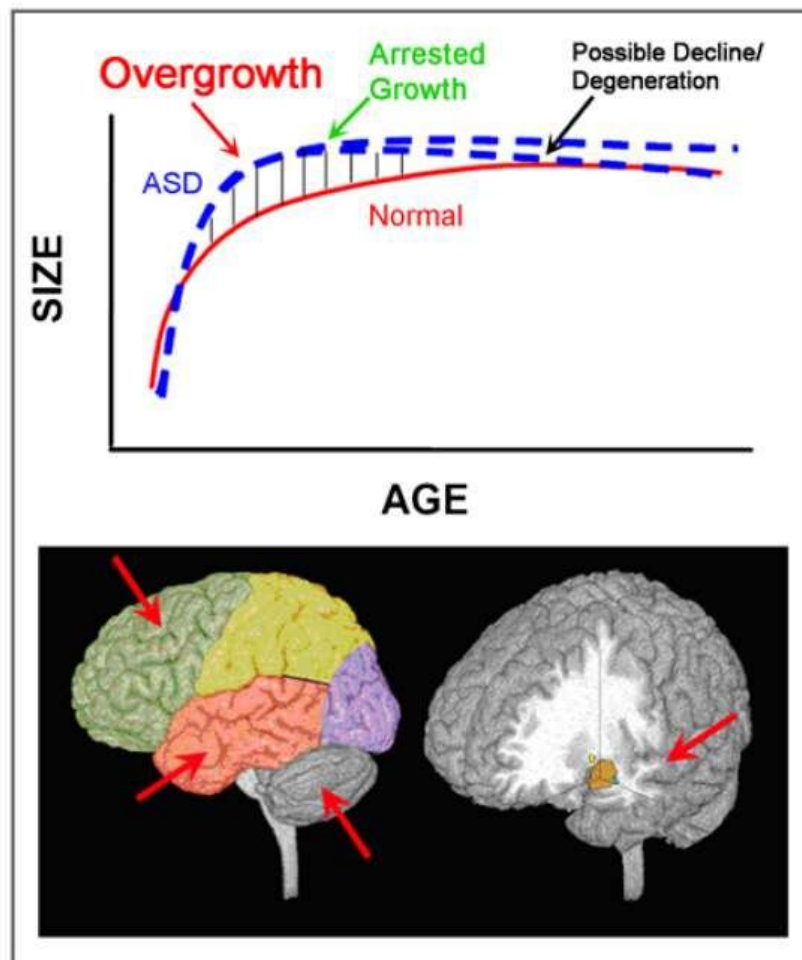








**Pre-birth exposures: miniature excitatory postsynaptic currents in layer V of pyramidal prefrontal cortex neurons of mice. Cell phones active on days 1 to 17 of gestation at 4.5 to 22.3 cm from mice. Aldad 2011**



### Figure 1. Regional Early Overgrowth in ASD

(A) Model of early brain overgrowth that is followed by arrest of growth. Blue lines represent ASD, while red lines represent age-matched typically developing individuals. In some regions and individuals, the arrest of growth may be followed by degeneration, indicated by the blue dashes that slope slightly downward.

(B) Sites of regional overgrowth in ASD include frontal and temporal cortices, cerebellum, and amygdala.

**Courchesne, 2007**

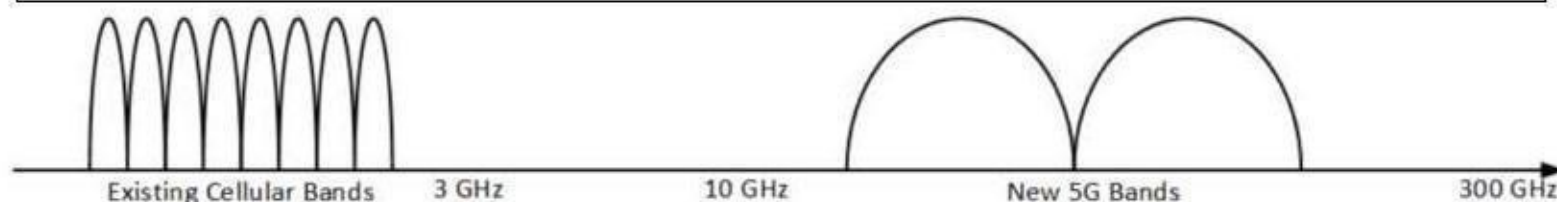


# 5G

## DATA TRANSMISSION RATE

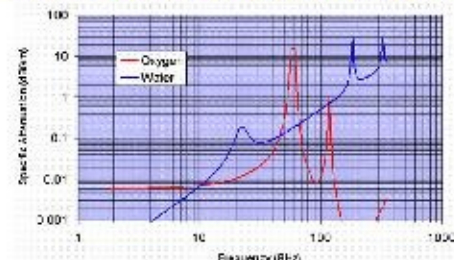
### Shannon-Hartley Equation

$$Capacity \left( \frac{Bits}{second} \right) = Bandwidth (Hz) \times \left( \frac{Signal (Watts)}{\boxed{Noise} (Watts)} \right)$$



Carrier Bandwidth ----0.002 GHz----- 0.1 GHz-----1-2 GHz-----

## AIR TRANSPARENCY



## ANTENNA APERTURE

$$Free Space Path Loss (dB) = 20 \log_{10}(d) + \boxed{20 \log_{10}(f)} + 20 \log_{10}\left(\frac{4\pi}{c}\right)$$

d in m, f in Hz, Gains in dB, c is speed of light in m/sec

## RADIATION PENETRATION DEPTH

At 10 GHz, penetration depth (37% of energy remains) is 5 mm, and at 50 GHz, it is 1 mm.

All energy is concentrated in this region. Within the first mm of skin, cells are dividing, and the nervous system extends very superficially in human skin. Ultraviolet light, known to cause cancer, has a penetration depth less than 0.1 mm.