

Forskning effekter av 4G/LTE

RESULTAT = effekter

RESULTAT = inga effekter

RESULTAT = studie av uppvärmning plastdocka

Sammanfattning:

Totalt finns det endast 12 publicerade vetenskapliga studier av effekter av 4G/LTE. Detta trots att 4G började byggas ut för ett decennium sedan. De studier som hittills gjorts av effekter på människor gäller endast korttidsexponering i 30 minuter och studerar främst effekter på den elektriska aktiviteten i hjärnan. Det finns ett par studier som studerat effekter på mänskligt blod och blodceller och några djurstudier som studerat effekter på spermier, testiklar och beteende bland möss som exponerats som längst under en månad. 10 av 11 publicerade studier visar effekter medan endast 1 inte visar några effekter. En av de tolv studierna studerar endast om 4G/LTE leder till uppvärmning av en plastdocka.

Det finns överhuvudtaget ingen studie som studerat effekter av långtidsexponering för de som bor nära basstationer eller mobilmaster för 4G. Det finns ingen studie som studerat effekter bland människor som använder mobiler uppkopplade med 4G.

Slutsats: Det finns inget vetenskapligt stöd för att hävda att det inte medför hälsorisker att bo nära basstationer för 4G. Det finns inte heller vetenskapligt stöd för att det inte innebär hälsorisker att använda mobiltelefon som sänder 4G.

Lista forskning effekter 4G/LTE till och med september 2020

- 1. Functional and network analyses of human exposure to long-term evolution signal**
Korttidsexponering försökspersoner människor. **RESULTAT:** *The results indicated that acute LTE exposure beneath the safety limits modulated both the functional connection and graph-based properties.* <https://pubmed.ncbi.nlm.nih.gov/32974829/>
- 2. Continuous Exposure to 1.7 GHz LTE (4G) Electromagnetic Fields Increases Intracellular Reactive Oxygen Species to Decrease Human Cell Proliferation and Induce Senescence.**
Korttidsexponering mänskliga celler 72 timmar. **RESULTAT:** *These observations strongly suggest that 1.7 GHz LTE RF-EMF decrease proliferation and increase senescence by increasing intracellular ROS in human cells.* <https://www.nature.com/articles/s41598-020-65732-4>
- 3. Empirical study on specific absorption rate of head tissues due to induced heating of 4G cell phone radiation.** Studie som analyserar om huvudet på en docka värms upp vid användning av mobiltelefon för 4G. (A phantom, simulating human head with skin, skull and brain). **RESULTAT:** *Although the measured SAR lie within the safe limit of 2 Wkg-1 recommended by the international regulatory body, considering the tremendous growth in*

the number of mobile phone users and prolonged use of mobile phone in communication purposes, the cumulative effects could be a real concern for human health.

<https://www.sciencedirect.com/science/article/abs/pii/S0969806X20302085>

4. **Effects of mobile phone radiation on certain hematological parameter.** Blod från 27 personer exponerades under 1 timma för 4G. **RESULTAT:** *Experimental results show that there is a significant change on the hematological components. The exposed blood samples were found to have decrease in platelet count only. Hemoglobin level, ESR rate and the WBC counts were found to be increased. While these observations are performed in a controlled laboratory conditions, the tremendous growth in number of mobile phone users, the effects could be many more folds especially in work places and cities even through passive exposure.* <https://www.sciencedirect.com/science/article/abs/pii/S0969806X19305481>

5. **Early-life exposure to pulsed LTE radiofrequency fields causes persistent changes in activity and behavior in mice.** Djurstudie exponering 30 min. per dag fem dagar i veckan från sena fosterstadiet till dag 21 efter födseln. **RESULTAT:** *The exposure caused significant effects on both appetitive behaviors and activity of offspring that depended on the SAR. Compared with sham-exposed controls, exposure at 0.5 W/kg significantly decreased drinking frequency ($P \leq 0.000$) and significantly decreased distance moved ($P \leq 0.001$). In contrast, exposure at 1 W/kg significantly increased drinking frequency ($P \leq 0.001$) and significantly increased moving duration ($P \leq 0.005$). In the absence of other plausible explanations, it is concluded that repeated exposure to low-level RF fields in early life may have a persistent and long-term effect on adult behavior.* <https://www.ncbi.nlm.nih.gov/pubmed/31522469>

6. **Long-term exposure to 4G smartphone radiation diminished male reproductive potential in testes of adult rats.** Djurstudie exponering 6 timmar om dagen (1 min inkommande samtal varje 10 min.) i 150 dagar för mobiltelefon i aktivt talläge. **RESULTAT:** *Results showed that SRF-EMR exposure for 150 days decreased sperm quality and pup weight, accompanied by testicular injury.Thus, long-term exposure to 4G SRF-EMR diminished male fertility by directly disrupting the Spock3-MMP2-BTB axis in the testes of adult rats. To our knowledge, this is the first study to show direct toxicity of SRF-EMR on the testes emerging after long-term exposure.* <https://www.ncbi.nlm.nih.gov/pubmed/31514029>

7. **Short-term radiofrequency exposure from new generation mobile phones reduces EEG alpha power with no effects on cognitive performance.** Människor kortidsexponering 20 minuter, 26 unga friska försökspersoner (21 ± 3 år) vilket ledde till påverkan på den elektriska aktiviteten i hjärnan. **RESULTAT:** *Both RF exposure types caused a notable decrease in the alpha power over the whole scalp that persisted even after the cessation of the exposure, whereas no effects were found on any aspects of performance in the Stroop test. The results imply that the brain networks underlying global alpha oscillations might require minor reconfiguration to adapt to the local biophysical changes caused by focal RF exposure mimicking MP use.* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6301959/>

8. **The Effect of a Single 30-Min Long Term Evolution Mobile Phone-Like Exposure on Thermal Pain Threshold of Young Healthy Volunteers.** Människor unga friska korttidsexponering 30 minuter (samma forskargrupp som nr 7 ovan). **RESULTAT:** (UMTS) MP led to mildly stronger desensitization to repeated noxious thermal stimulation relative to the sham condition.... we did not find any effects of LTE exposure on thermal pain threshold. The present results, contrary to previous evidence obtained with the UMTS modulation, are likely to originate from placebo/nocebo effects and are unrelated to the brief acute LTE EMF exposure itself. The fact that this is dissimilar to our previous results on UMTS exposure implies that RF modulations might differentially affect pain perception and points to the necessity of further research on the topic. <http://www.mdpi.com/1660-4601/15/9/1849>
9. **Modulation of brain functional connectivity by exposure to LTE (4G) cell phone radiation.** Korttidsexponering människor 30 minuter. **RESULTAT:** We found that the acute LTE-EMF exposure modulated localized intra-regional connectivity. <https://onlinelibrary.wiley.com/doi/full/10.1002/bem.22165>
10. **Effect of Electromagnetic Waves from Mobile Phones on Spermatogenesis in the Era of 4G-LTE.** Djurförsök 20 råttor, varav 5 kontroller oexponerade, exponerades mellan 6 till 18 timmar dagligen i 28 dagar. **RESULTAT:** The longer exposure duration of electromagnetic field decreased the spermatogenesis. In particular, the sperm and Leydig cell counts significantly decreased in the long duration exposure group, showing that continuous cell phone use could be hazardous for fertile men, especially adolescent men. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5896334/>
11. **Long-Term Evolution EMF Exposure Modulates Resting State EEG on Alpha and Beta Bands.** Korttidsexponering 30 minuter 25 unga personer (30.2 ± 2.7 år). **RESULTAT:** Exposure to LTE EMF reduced the spectral power and the interhemispheric coherence in the alpha and beta bands of the frontal and temporal brain regions.... The reduction in alpha band activity has been associated with a decrease in individual information-processing ability, alertness, and cognitive performance. The decrease in beta band activity could be interpreted as decreased alertness, arousal, and excitement or a low level of fatigue. <http://1.usa.gov/2475GM3>
12. **The alteration of spontaneous low frequency oscillations caused by acute electromagnetic fields exposure.** Korttidsexponering av 18 personer i 30 minuter. **RESULTAT:** We found the decreased ALFF value around in left superior temporal gyrus, left middle temporal gyrus, right superior temporal gyrus, right medial frontal gyrus and right paracentral lobule after the real exposure. And the decreased fALFF value was also detected in right medial frontal gyrus and right paracentral lobule. **CONCLUSIONS:** The study provided the evidences that 30 minute LTE RF-EMF exposure modulated the spontaneous low frequency fluctuations in some brain regions. <https://www.ncbi.nlm.nih.gov/pubmed/24012322>