

## **Magnetophosphene perception thresholds and EEG responses in humans exposed to power-frequency magnetic fields of up to 50 mT**

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### **Abstract Summary (approx. 200 words): \***

Both ICNIRP and IEEE recommendations/guidelines aim to protect individuals against adverse health effects of electromagnetic field (EMF) exposure. In the Extremely Low Frequency (ELF) range, this is based on acute effects on the human central nervous system, i.e. on the threshold for retinal magnetophosphene perception ('flickering-lights' perceived in a dark environment under a time-varying magnetic field (MF) exposure). Although magnetophosphenes are the most robustly exposure-related established effect, the perception threshold at power frequencies (50 and 60 Hz) remains uncertain, since it is based on estimates extrapolated from non-replicated experimental data acquired at lower frequencies with relatively small numbers of subjects.

This project aims to establish the magnetophosphene perception thresholds at 50 and 60 Hz in healthy volunteers (n = 30 at 60 Hz, n = 30 at 50 Hz - approved by Western University ethics board: HSREB #18882) and to simultaneously study the electroencephalographic (EEG) response in visual cortex regions.

Subjects are tested in 2 localized exposure conditions (eyeball and occipital cortex using a small coil) and 1 entire head exposure condition, each scanning 11 magnetic flux density conditions (0 to 50 mT, 5 mT increments). Magnetophosphene perception reported by button-press and occipital EEG are recorded and analysed.