

# Scambi tra cromatidi fratelli (SCE) e *High-Frequency Cells* in lavoratori professionalmente esposti a campi magnetici a frequenza estremamente bassa (ELF)

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## KEY WORDS

ELF; magnetic fields; occupational exposure; genotoxic effects; SCE; HFC

## SUMMARY

**«Sister chromatid exchanges (SCE) and high frequency cells in workers occupationally exposed to extremely low frequency magnetic fields».** Background: Up now no firm conclusions can be drawn on the genotoxicity of Extremely Low Frequency (ELF) Magnetic Fields (MF) in exposed workers: both an increase in chromosomal aberrations (CA) and micronuclei (MN) or no effects were observed in substation workers, while a slight increase in CA, but not in sister chromatid exchanges (SCE) or MN was reported in linesman; an increase in CA was observed in cable splicers and, more recently, in train engine drivers, but results have not been replicated. Objectives: Objective of the study was an evaluation of possible genotoxicity of occupational exposure to ELF-MF. Methods: SCE, high-frequency cells (HFC) and SCE in HFC were measured in peripheral blood lymphocytes from 70 workers exposed to various levels of ELF-MF in different occupations, not involving exposure to known mutagens or carcinogens. In all participants, individual ELF-MF exposure was measured throughout the whole work-shift for 3 consecutive days by personal monitoring. Results: Time Weighted Average (TWA) values of ELF-MF in the whole group ranged from 0.01 to 3.48  $\mu T$ ; the geometric mean was 0.19 mT, and only 3 subjects exceeded 2  $\mu T$ . According to the individual TWA exposure, subjects were divided into two groups: low exposed ( $\leq 0.2 \mu T$ ) and highly exposed ( $> 0.2 \mu T$ ). The mean values of SCE, HFC and SCE in HFC were compared between low and highly exposed: no significant differences were observed. The result was further tested by selection and comparison of workers exposed up to 0.1  $\mu T$  vs. exposed  $> 0.4 \mu T$  only, i.e. excluding intermediate exposures: again no difference in genotoxicity indices was observed. Also multivariate analysis did not show any correlation between individual ELF-MF exposure and genotoxicity indices. Conclusions: The results of our study do not give any support to the hypothesis that occupational exposure to ELF-MF up to about 2  $\mu T$ , i.e. at the levels currently found in most workplaces, can exert a genotoxic effect in workers.

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