EXPERIMENTAL STUDY TO DETERMINE THE ATTENUATION OF ELECTROMAGNETIC FIELDS EFFECTS ON CELL CULTURES BY SVITEC "Mobile Badge" DEVICE (PENERGETIC-RAYGUARD TECHNOLOGY).

Marinelli Fiorenzo - Institute of Molecular Genetics CNR Bologna
Curci Rosa - Institute I.O.R Lab. Ramses
Tomassetti Goliardo - Institute of Radioastronomy CNR Bologna

Introduction

The exposure of general population to electromagnetic fields is increasing in recent years. The IARC classified radiofrequency in 2011 as possible carcinogen to humans.

Not only the precaution principle should be applied to reduce in general the levels of radiofrequency electromagnetic fields (RF-EMF) in the environment, but also new systems should be studied to protect people from such exposure.

The Svitec "Mobile Badge" was put under experimental study to determine if it can protect from the biological effects of EMF on cells.

Materials and methods

Cultured CCRF-CEM cells used for many experiments on radiation effects, (biblio) have been irradiated by 900 MHz emitting device for 24 h as in previous studies (Marinelli et al. 2004).
TEM cell in which were placed the culture flasks, received the signal from a standard cellular telephone controlled by a CMD 55 Rhode e Schwarz device.
Power density of – 25 dBm

Cell cultured from the same flask was divided in five flasks (1,2,3,4,5) with the same number of cells 150.000 /ml in standard culture conditions 95% humidity, 37°C temperature and 5% CO2.

Flask 1 - Control flask out of the TEM-cell
Flask 2 - Exposed inside the TEM-cell with the ""Mobile Badge" attached"
Flask 3 - Exposed to EMF inside the TEM-cell

A week before a different experiment was performed with the same apparatus to determine the effects on the cultured cell exposed to the same EMF.

Flask 4 - Control flask outside the TEM-cell
Flask 5 - Exposed cells inside the TEM-cell

All the samples were treated in the same way for the analysis with MTS by and Western Blot (Biblio). Antibody anti Caspase-3 and Bcl2 were used to evident the gene activation.

Results
The EMF irradiated cultured cells show a cytotoxicity evident by MTS proliferation test with a statistical significant difference between exposed cells and not exposed controls. The western blot analysis of the samples with anti Caspase 3 antibodies showed a gene activation band which is over expressed in exposed samples more than in the control cells (Fig.2).

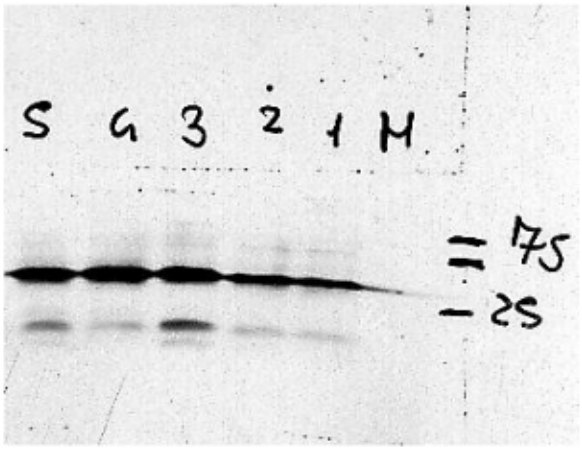


Fig 2. Western Blot analysis. The band of expressed antibody anti-Caspasi-3 in dark black doubble band are visible.

Lane 1	Control cells Outside of TEM-cell.
Lane 2	Exposed cells protected by “Mobile Badge” inside the TEM-cell.
Lane 3	Exposed cells inside the TEM-cell.
Lane 4	Previous experiment control cells
Lane 5	Previous experiment exposed cells

It is evident that the cells exposed to the EMF inside the TEM-cell (Lane 3) show a marked expression of Caspase-3 induced by the EMF exposure.

The EMF-exposed cells with the “Mobile Badge” attached (Lane 2) show a less marked expression of caspase-3 in the same quantity as the unexposed control cells (Lane 1)

Discussion

The flasks with the “Mobile Badge” showed that, the number of cells after the exposure, were less than the control flasks with significant difference.

This is related to the apoptotic induction by the EMF exposure. The WB analysis confirmed that the protected flasks show a less activation of the Caspasi-3 gene, which determined a lower apoptotic signal in the culture.

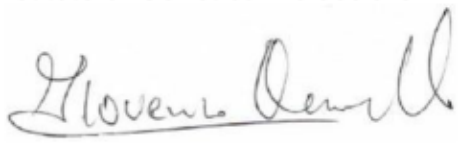
From this data it is possible to hypothesize that the presence of the “Mobile Badge” from Svitec, attached to the culture flask, can influence the gene activation of Caspasi-3 and consequently protect the cells from apoptotic activation, which is evident in the cells exposed to the EMF without the “protection” (see lane 3 and 5).

In this way these preliminary results show that there can be an influence of the Svitec “Mobile Badge” in preserving the cells from the biological effects of the RF-EMF applied.

NEXT STUDIES

In order to reach a deeper insight of the “Mobile Badge” functioning it is suggested to develop further studies. Respective proposals will be submitted during the nex few weeks.

Istituto di Genetica Molecolare



Fiorenzo Marinelli

Bologna 13/12/2012

Bibliografia