Medical/biological Study (experimental study)

Non-thermal activation of the hsp27/p38MAPK stress pathway by mobile phone radiation in human endothelial cells: Molecular mechanism for cancer- and blood-brain barrier-related effects.

By: Leszczynski D, Joenvaara S, Reivinen J, Kuokka R
Published in: Differentiation 2002; 70 (2-3): 120 - 129

Aim of study (according to author)

To determine whether non-thermal exposure of cells to 900 MHz GSM mobile phone radiation activates signal transduction pathways and induces cellular stress response in a human model.

Endpoint

- activation of signal transduction pathways and induction of cellular stress response (expression status of heat shock protein 27 and p38MAPK)

Exposure

General category: GSM, microwaves

Field characteristics	Parameters
900 MHz pulsed (PW) exposure duration: continuous for 1 h	SAR: 2 W/kg mean value (1.8-2.5 W/kg)

Exposed system:
intact cell/cell culture (in vitro)
EA.hy926 cells

Methods

Endpoint/Measurement parameters/Methodology

- molecular biosynthesis: protein phosphorylation; expression status of heat shock protein 27 and p38MAPK
- others: activation of signal transduction pathways and induction of cellular stress response (see above)

investigated material: isolated bio./chem. substance (in vitro)

time of investigation: after exposure

Main outcome of study (according to author)

The results suggest that mobile phone radiation activates cellular signal transduction and stress response pathways. 1-hour of non-thermal exposure of the cells changes phosphorylation status of numerous, yet largely unidentified, proteins. One of these proteins was heat shock protein 27 (hsp27). Mobile phone exposure caused a transient increase in phosphorylation of hsp27. This was prevented by a specific inhibitor of p38 mitogen-activated protein kinase (p38MAPK). Mobile phone caused also transient changes in the protein expression levels of p38MAPK and hsp27.

(Study character: medical/biological study, experimental study, full/main study)

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