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Effect of low frequency electromagnetic field on functional groups in HaCaT cells.

Sabrina Rieti, Lisi Antonella, Mario Ledda, Emanuela Rosola, Livio Giuliani*, Enrico D' Emilia^, Alberto Foletti, Grimaldi Settimio,

Istituto di Stuttura della Materia, CNR, via Fosso del Cavaliere 100, 00133 Roma, Italy

^ISPESL-DIPIA ISPESL *VENEZIA MESTRE

Abstract

HaCaT cells have been exposed for 3 days to a sinusoidal 7 Hz electromagnetic field at a flux density of 100 μT (rms) in a temperature regulated exposure systems. Infrared wavelength-selective scanning near-field optical microscopy measurements have performed with the aim to localize the changes induced by the electro-magnetic field in the distribution of the inner chemical functional groups. The biochemical variations were observed with an optical resolution of ~80 nm and were also accompanied by a change in morphology and cell biochemistry.

Indirect immunofluorescence with fluorescent antibodies against involucrin and β4 integrin, both differentiation and adhesion markers, revealed an increase in involucrin and β integrin expression, supporting that exposure to electric field carries keratinocytes to an upper differentiation level.

Such study confirmed our previous observation and support the hypothesis that 7 Hz electro magnetic field, may modify cell biochemistry and interfere in differentiation and cellular adhesion of normal keratinocytes.