

Proteomic analysis of murine peritoneal macrophages after in vitro exposure to static magnetic field

Eun Jae-Soon, Ko Dae-Woong*, Kwak Young-Geun¹

College of Pharmacy, Woosuk University, ¹Chonbuk National University Medical School

A number of studies have demonstrated recently nonthermal interactions of extremely low frequency electromagnetic fields with cellular systems, such as the cells of the immune system. Particular concern came from epidemiological findings, which correlated environmental exposure of human body to weak electromagnetic fields with an elevated risk for developing certain type of leukemias and cancers. Several home/environmental sources generating extremely low frequency electromagnetic fields, such as 50 - 60 Hz high-voltage transmission lines, video display terminals, electric blankets, clinical nuclear magnetic resonance imaging procedures, etc., may interact with the human body. In this study we examined the effects of static magnetic fields (SMF) on the phagocytosis of the murine peritoneal macrophages (C57BL/6). The cells were exposed in vitro for 24 h at 37 °C to 400 G SMF. The phagocytic activity of peritoneal macrophages was determined with a luminometer. Exposure to the SMF decreased phagocytic activity of murine peritoneal macrophages. In order to provide a more exact mechanism of the phenomenon, we analyzed peritoneal macrophages for alteration in their proteomes. The expression levels of these 5 proteins were increased in the SMF. In total 5 proteins which were differentially expressed in the SMF compared with control group were identified. The expression levels of these 5 proteins were increased in the SMF.