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Application of transcriptomics on study of biological effects of magnetic field exposure

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Transcriptomics is one of functional genomic approaches widely applied in life science research in recent years. Based on the background of crosses and integration between environmental science and life science subjects, growing cutting-edged molecular technologies such as proteomics, metabolomics and etc., are applied in studying environmental problems, especially exploring biological relationships between human living environments and health. Electromagnetic environment is one of extensively existed urban environmental factors in modern life during the development of urbanization and modernization. Thus, it is indispensable and inevitable to investigate the biological effects of electromagnetic field (EMF) on human health and disease. Transcriptomic analysis, which could to some extent reflect the gene expression alteration under EMF exposure, is rewarding to much deeper understanding on molecular mechanism of living organism sensing and responding to EMF exposure. In our study, we have explored the bio-effects of extremely low-frequency electromagnetic field (ELF-EMF) and radio frequency electromagnetic field (RF-EMF) via transcriptomic analysis on model organism, such as *Saccharomyces cerevisiae*, *Drosophila melanogaster* and *Caenorhabditis elegans*. Several results indicate that the living organism indeed response to EMF exposure and different model organism showed changes in various ways. Therefore, the utilization of transcriptomic approach on studying the health effect of EMF exposure lays the molecular basis for further research on mechanism of electromagnetic field sensing and responding.

Biography

Yongyan Sun is now a PhD candidate in Institute of Urban Environment, Chinese Academy of Sciences. And her major is environmental science, and she mainly keeps significant attention to the biological effects study on physical environmental factors. Recently her research work primarily focuses on the effects of electromagnetic fields. Here the presentation mainly reports the combined application of transcriptomic analysis in biological study on effects of physical environmental factors, which gives some hints on new perspectives of environmental science study. Chao Tang, the research assistant working at IUE, is also a doctoral student. Linlin Duan, a postgraduate at IUE, They mainly focus on researches of the bioeffects of electromagnetic environment exposure on model organisms. Their supervisor Prof. Peng Cai, obtained his PhD degree from Shanghai Institute of Biochemistry, Chinese Academy of Sciences and postdoctoral studies from NIDDK, NIH and Uniformed Services University of the Health Sciences, DOD of USA. He is the Chief of Physical Environment Laboratory and Deputy Director-General of IUE, Chinese Academy of Sciences.

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