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DEPARTMENT OF RADIATION AND ENVIRONMENTAL BIOLOGY

Head of Department: *Assoc. Prof. Antonina Cebulska-Wasilewska*

Deputy: *Agnieszka Panek, M.Sc.*

Consultant: *Jerzy Huczowski, Ph.D.*

telephone: (48) (12) 637-02-22 ext.: 322

e-mail: wasilews@alf.ifj.edu.pl

PERSONNEL:

Laboratory of Radiation and Environmental Genetic:

Head: Assoc. Prof. Antonina Cebulska-Wasilewska

Deputy: Anna Wierzevska M.Sc.

Research Staff:

Dorota Florjan, M.Sc.

Agnieszka Panek, M.Sc.

Wojciech Dyga, M.Sc., Eng., Ph.D. Student

Krystyna Schneider, M.Sc., Eng., Ph.D. Student

Technical Staff:

Jolanta Adamczyk

Ewa Bartel

Ewa Kasper, M.Sc.

Joanna Wiltowska

Laboratory of Radiation and Environmental Mutagenesis:

Head: Barbara Pa³ka, Ph.D.

Technical Staff:

Tomasz Janiszewski, Eng.

Małgorzata Litwiniszyn, M.Sc.

Igor Pawłyk, M.Sc., Eng.

Ewa Tomankiewicz, M.Sc., Eng.

Neutron Therapy and Pre-clinical Research Division:

Deputy: Wojciech Niedzwiedz, M.Sc.

Research Staff:

Janusz Gajewski, M.Sc.

Technical Staff:

Barbara Janiszewska, M.Sc., Eng.

Stanisław Krasnowolski, M.Sc.

OVERVIEW:

The year 1999 we devoted mainly to the activities concerning our basic research, and requirements and expectations of three research projects. The environmental project from the European Community was supporting our research in the issues of human monitoring of occupational exposure to pesticides. The two other radiobiology projects from the State Committee of Research were supporting our search on the biological efficiency and its enhancement of radio-therapeutic sources of various LET radiation. We succeeded fruitful co-operation with colleagues from Academy of Mining and Metallurgy that let us go faster with modernization of our laboratory by automation of our methods for screening cytogenetic damages. A lot of efforts were paid to modify our work by automatic reports of the coordinates of aberrant metaphases, and to make a smooth work of our new and own metaphase finder. We are sure that our new and unique research tool will not only enhance the accuracy and speed of measurements, but will also be useful for the purpose of the retrospective biological dosimetry of absorbed doses. We have applied fluorescent *in situ* hybridization (FISH) for cytogenetic studies of biological effects induced by neutrons. Now, we are looking forward to apply this technique in a combination with the DNA damage measures done by SCGE assay, to our research on mechanisms of the induction and repair, or interaction of the lesions induced by genotoxic agents. Understanding of the regulation of these processes could be a good goal for the new century to come.



Assoc. Professor Antonina Cebulska-Wasilewska

REPORTS ON RESEARCH:

Monitoring of Genotoxic Effects in Lymphocytes of People Exposed to Pesticides (Polish Group)

A. Cebulska-Wasilewska, Z. Drag¹, E. Kasper, W. Dyga, and A. Wierzevska

¹*Institute of Sociology, Jagiellonian University, Kraków, Poland*

Extensive use of pesticides in a modern agriculture and their genotoxic effects might create a potential hazard to the environment and human health. The challenge for environmental studies is to further improve the process for assessing risk to human health from exposure to agents, by the use of biomarkers detected in assays predictive of potential toxic outcomes and pathological changes. This should provide the opportunity for more effective preventive measures against exposures that deemed hazardous to human health. This paper presents preliminary data from the collaborative research program aimed to investigate the relationship between exposure to genotoxic agrochemical and the induction of genetic damage in human cells. Applications of biomonitoring procedures and comparison of biomarkers levels detected were planned for several subgroups; a reference and occupationally exposed to various agrochemical and collected from four countries (Greece, Hungary, Poland and Spain). In this paper are presented data on group's characteristics and the DNA damage and sister chromatid exchanges (SCE) analyzed in blood lymphocytes of Polish subgroups under the study. Venous blood samples were collected by venipuncture from male donors (50 persons in a reference group and 50 persons in a group occupationally exposed to pesticides). Among donors from the reference group were represented skilled state workers, students, teachers or clerks with liberal or technical education and a low or medium income. Occupationally exposed group contained of farmers working with various agrochemicals in their own farms and greenhouses. Interviews were performed with questionnaire considering health, work period and job conditions, types of genotoxic risk, life style and habits and any possibilities of hazardous exposure leading to increased genotoxic risk. Analysis of the data obtained from the interviews and results of preliminary measures revealed that; although, occupationally exposed group showed significantly higher frequency of some health problems, though, on the average a slight increase observed in the DNA damages and sister chromatid exchanges to occupational exposure was not significant.