Symposium no. 6: Environmental Carcinogens and Relevance to Humans

6.007

EFFECT OF TOPOISOMERASES INHIBITORS ON DNA REPAIR REPLICATION

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The effect on DNA repair of the antitumor drugs, topoisomerase poisons camptothecin (for topo I), VM26 and fostriecin (for topo II) was studied using the in vitro excision repair system developed by Wood et al. [Cell (1988),53, 97].
Only slight decreases in the repair signal were observed in the presence of camptothecin or VM26. On the contrary, a marked decrease in the repair efficiency was caused by fostriecin. Kinetic studies show that the repair replication reaction is impaired already at early times (first 45' of incubation).
In addition to inhibit topo II activity [Boritzki et al. (1988) Biochem. Pharmacol., 37, 4063], fostriecin appears also able to inhibit topo I. Further, inhibitory effects are exerted on repair enzymes different by topoisomerases: DNA polymerase activity (as measured by ability to carry out a nick-translation reaction) is inhibited by fostriecin. The mechanism of this DNA synthesis block is under investigation.

6.008

IS THE OIL REFINERY PLANT A DANGEROUS WORKPLACE FOR PLEURA CANCER? SOME EPIDEMIOLOGICAL EVIDENCE.

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In oil refinery plants, asbestos, used for insulation purpose, is not strongly associated with pleura cancer. Nevertheless in Genoa, after comparison with general population, among about 800 ERG oil refinery workers potentially exposed to asbestos, a high frequency of pleura cancer cases (SMR=483, p<0.009) was observed. Most cases are not histologically confirmed, and no asbestos fibers were searched for; nevertheless they were documented by the practitioner on death certificates and a large amount of all types of asbestos fibers were observed in the plant that was partially shut down in 1989. Given the biological plausibility and latency, this analysis does not exclude the causality between asbestos and pleura cancer in oil refinery plants.

6.009

THREE YEARS FOLLOW-UP IN 1986-1987 INCIDENT LUNG CANCER PATIENTS.

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The survival experience of 1193 incidence lung cancer cases, 85% males and 15% females, residents in Genoa and diagnosed in the period 1986-87, was analyzed. Cases were followed till June 30, 1991. They were registered and coded according to ICD-O by the Genoa Cancer Registry. Age at diagnosis, sex,cito-histological morphology,localization of metastasis were evaluated by proportional hazard model (Cox), Kaplan-Meier survival analysis. After three year follow-up, not more than 10% of patients is alive and better survival experiences ($p < 0.05$) were observed for squamous cell carcinoma, in patients and females younger than 65 years old.

6.010

Zn, Cd, Sialic acid concentration in normal, hyperthrophic and malignant prostate tissues.

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Although prostate Ca is one of the most extensively studied malignancies, its real causative factors continue to elude us. Environmental factors such as Cd,Zn have been considered as some of the causative factors. The ratio of Zn conentrations in blood or in tissue may be of diagnostic value like other tumor markers such as sialic acid. In our investigations we looked at the levels of Zn,Cd and sialic acid mainly in prostate tissues of seven malignant,benign hyperthrophic and normal patients. The results could be summarized as: Cd levels (normal µ/g 81.9±8.1;B.P.H.142.7±9.9;P.C. 531±52.8) Zn levels (Normal µ/g 685.3±40.1.; B.P.H. 715.5±32.6; P.C. 220.6±37.5) We could not fiund a good correlation between tissue and serum levels of sialic acid. It could be observed from the data that as the levels of Cd increased the prostate tissues the Zn levels decreased. From these results it may be proposed that high levels of Cd could block the protective effect of Zn in prostate tissues and increase the risk of malignant neoplasms.

6.011

USE OF MODEL CHEMICALS FOR STUDYING THE INDUCTION OF DIFFERENT GENETIC END POINTS AND THEIR MECHANISMS

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Numerous publications in genetic toxicology refer to the study of the mutagenicity of large numbers of different environmental chemicals in different test systems. The tendency in general is to test many chemicals in specific systems, which of course is reasonable regarding screening and regulation for the control of environmental pollutants, although the large number of existing chemicals consists a pessimistic point about the possibility of regulating all of them by this principle. But considering mechanisms of chemically-induced different end points it might be more important to concentrate on specific chemicals by testing them in as many as possible test systems for understanding more about their mode of genetic action. In this work we used as a model chemical, benomyl,in S. typhimurium, E. coli, Aspergillus nidulans, Hordeum vulgure and mammalian systems. From the data obtained it was shown that benomyl was mainly a spindle poison resulting in formation of aneuploids.

6.012

THE GOAL AND MAIN TASKS OF ONCOECOLOGY

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Understanding of the postponed effects of biosphere pollution by chemicals and other environmental factors (EF), can explain the growing interest to oncoecology. Oncoecology is a new field in the study of relationships between organisms, and between organisms and environment, which can produce cancer. Oncoecology aims at the protection of the environmen from the factors negatively affecting the ecosystems and producing tumors in the various organisms in these systems. The main tasks of oncoecology are: 1) understanding of the role of biotop in natural and anthropogenic formation of carcinogens, and persistence of the later in biogeocenosis; 2) analysis specific and non-specific reactions of biota to the action of carcinogens, the role of biome in their circulation and biotransformation; 3) integral evaluation and prognosis of the damages of biocenosis and ecosystems caused by EF.