OCCUPATIONAL EXPOSURE TO HYdroCARBON SOLVENTS AND K-RAS ACTIVATION IN EXOCRINE PANCREATIC CANCER. J Alguacil*, M Porta, N Malats, M Kogevinas, T Kauppinnen, T Partanen, FG Benavides and FX Real (Institut Municipal d’Investigació Médica, Barcelona Spain)

Occupational exposure to hydrocarbon solvents (HS) has been found to be associated with an increased risk of exocrine pancreatic cancer (EPC). Pancreatic cancer is the human tumor with the highest prevalence at diagnosis of K-ras mutations. ras genes are known critical DNA targets for chemical carcinogens. The objective of the present study was to analyze the relationship between past occupational exposure to HS and mutations in the K-ras gene in EPC. The study included 107 incident EPC cases for whom histologic or histologic material could be analyzed for K-ras mutations, and from whom information on life-style, diet, and clinical, demographic and occupational factors was available. Occupational exposure to HS (alkaline, aromatic, chlorinated, benzene, ‘other organic solvents’) was assessed using two METHODS: industrial hygienists (IH) and a job-exposure matrix (FINEXM). Exposure to HS was compared among K-ras mutated EPC cases and K-ras wild type EPC cases. Adjusted odds ratios (OR), and their 95% confidence limits (CI) were computed by unconditional logistic regression. Overall, 7-fold increased ORs were found for K-ras mutated EPC for every group of solvents evaluated with FINEXM, while on the basis of the IH only exposure to benzene in men reached statistically significant difference (OR=7.07, 95% CI 1.07 - 145). When requiring exposure to have taken place on the basis of both IH and FINEXM, over 6-fold risks were obtained for aromatic, alkaline, and for ‘any hydrocarbon solvent’. Conclusion. Hydrocarbon solvents might be involved in the pathogenesis of EPC through K-ras activation.

OCCUPATIONAL RISK FACTORS FOR MALE BLADDER CANCER. M Zeegers*, G Swaen, Y Kant, A Goldbohm and P van den Brandt (Maastricht University, Maastricht Netherlands)

The association between occupational exposure to paint components, polycyclic aromatic hydrocarbons (PAH), diesel exhausts, aromatic amines and bladder cancer was investigated in a prospective study among 58279 men aged 55-69 at baseline (1986). The cohort members completed a questionnaire on cancer risk factors including job history. Follow-up was established by linkage to cancer registries until 1992. A case-cohort approach was used based on 532 cases and 1630 subcohort members. A case-by-case expert assessment was carried out to assign the subjects a cumulative probability of occupational exposure. Men in the highest tertiles of exposure to paint components, PAH, aromatic amines and diesel exhaust had higher adjusted incidence rate ratios (RR) (95% confidence interval) of bladder cancer than men with no exposure: 1.29 (0.71-2.33), 1.24 (0.68-2.77), 1.52 (0.41-4.23) and 1.21 (0.78-1.85), respectively. The associations between paint components, PAH and bladder cancer were most pronounced for current smokers. Among former smokers, men who had smoked >=15 cigarettes/day had RRs below unity for paint components and PAH compared with men who had smoked <15 cigarettes/day; whereas among current smokers the opposite was found. Exposure to diesel exhaust was positively associated with bladder cancer among those who had smoked >=15 cigarettes per day. This study suggests an association between occupational exposure to paint components, PAH, aromatic amines and bladder cancer. The authors found an interaction effect with cigarette smoking, specifically for paint components, suggesting that the carcinogenic effect on the bladder might decrease after smoking cessation.

UPDATE OF MORTALITY AMONG UNION CARBIDE CORPORATION CHEMICAL WORKERS IN THE KANAWA VALLEY OF WEST VIRGINIA: 55 YEARS OF OBSERVATION. H Pastides*, MW Zorn, KA Mundt and MJ Teta (University of Massachusetts School of Public Health, Amherst, MA 01003)

This study updates the mortality experience of Union Carbide Corporation male workers employed between 1940 and 1978 at one of three company locations in the Kanawha Valley of West Virginia: South Charleston, Institute, and, Technical Center. The study now provides up to 55 years of cohort follow-up, through December 31, 1994. Standardized Mortality Ratio analyses were performed for total mortality and for specific causes of death, controlling for age and calendar year. United States mortality rates were used as one reference group for the period 1940-94; West Virginia rates were also used for the period 1960-94. Plant and wage status specific analyses were also performed. Approximately 41% of the cohort was deceased as of the end of 1994. Overall, mortality rates were lower than expected, with the most favorable patterns seen for salaried employees. Among hourly employees, elevated Standardized Mortality Ratios were seen for non-Hodgkin’s lymphoma and for cancer of the liver, not specified as primary or secondary. These causes of death are of particular interest because they have been suggested by previous reports. A smaller excess, not previously observed, was also seen for kidney cancer among hourly males. Most excesses in the Kanawha Valley cohort overall were attributable to excesses seen in the South Charleston hourly population. There was also some evidence of excess non-Hodgkin’s lymphoma mortality among hourly men at the Institute plant, although the excess mortality was influenced by cases that also worked at the South Charleston plant.

BLACK TEA CONSUMPTION REDUCES RISK OF RECTAL CANCER AMONG WOMEN IN MOSCOW. D Il'yasova*, L Arab, A Martinlichik, A Sdvizhkov, L Urbanovich and U Weisgerber (University of North Carolina, Chapel Hill, NC 27599-7400)

Background: Experimental evidence strongly supports the preventative potential of active ingredients from tea in colorectal carcinogens. Results from epidemiological studies on black tea consumption and colorectal cancer risk are inconsistent, possibly due to difference in study designs, limited variation of tea-drinking, and inappropriate exposure assessment. A population-based case-control study was conducted to investigate the effect of black tea-drinking on the risk of rectal cancer in Moscow residents, a population with wide range of black tea consumption. METHODS: 663 incident cases of adenocarcinoma of the rectum/recto-sigmoid junction and 323 frequency-matched by age population controls were included in this analysis. Data collection was conducted through in-person interviews by the trained interviewers and included detailed information on tea consumption, alcohol intake, smoking, physical activity, health history, family history of colorectal cancer, demographic data, and dietary assessment. Adjusted odds ratios and 95% confidence intervals were obtained using unconditional logistic regression models. RESULTS: Tea consumption was consistently associated with lower risk of rectal cancer in women, but not in men. Among women, the inverse association adjusted for age and BMI was stronger when tea consumption was expressed as amount of tea concentrate (0.50, 95% CI 0.30-0.81) or dry tea leaves used for tea preparation (OR=0.56, 95% CI 0.38-0.81). Further adjustment for other risk factors did not materially change these findings. Conclusion: Black tea drinking appears to lower risk of rectal cancer in women, but not in men. A possible estrogen-like effect of some tea polyphenols to explain the gender-specific association needs further investigation.