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The goals of this study were to determine correction factors between the inhalable samplers (IOM and Button) and the CFC and Cyclone for dusts sampled in livestock buildings and to determine whether these factors vary among livestock types.

In this study, the environmental impact of fires is illustrated with many examples. The article says fire brigades should keep environmental protection in mind while fighting fires and choose environmentally friendly methods.

Field and Wind Tunnel Comparison of Four Aerosol Samplers Using Agricultural Dusts

Occupational lung disease is a significant problem among agricultural workers exposed to organic dusts. Measurements of exposure in agricultural environments in the USA have traditionally been conducted using 37-mm closed-face cassettes (CFCs) and respirable Cyclones. Inhalable aerosol samplers offer significant improvement for dose estimation studies to reduce respiratory disease. The goals of this study were to determine correction factors between the inhalable samplers (IOM and Button) and the CFC and Cyclone for dusts sampled in livestock buildings and to determine whether these factors vary among livestock types. Results allow comparison between inhalable measurements and historical measurements. Ten sets of samples were collected in swine, chicken, turkey, and dairy facilities in both Colorado and Iowa. Pairs of each sampling device were attached to the front and back of a rotating mannequin. Laboratory studies using a still-air chamber and a wind tunnel provided information regarding the effect of wind speed on sampler performance. Overall, the IOM had the lowest coefficient of variation (best precision) and was least affected by changes in wind speed. The performance of the Button was negatively impacted in poultry environments where larger [feather] particulates clogged the holes in the initial screen. The CFC/IOM ratios are important for comparisons between newer and older studies. Wind speed and dust type were both important factors affecting ratios. Based on the field studies a ratio of 0.56 was suggested as a conversion factor for the CFC/IOM (average for all environments because of no statistical difference). Suggested conversion factors for the Button/IOM were swine...
Investigating the mechanisms of hallucinogen induced visions using 3,4-methylenedioxymphetamine (MDA): a randomised controlled trial in humans

2011-09-26

The mechanisms of drug-induced visions are poorly understood. Very few serotonergic hallucinogens have been studied in humans in decades, despite widespread use of these drugs and potential relevance of their mechanisms to hallucinations occurring in psychiatric and neurological disorders. The mechanisms were investigated by measuring the visual and perceptual effects of the hallucinogenic serotonin 5-HT2AR receptor agonist and monoamine releaser, 3,4-methylenedioxymphetamine (MDA), in a double-blind placebo-controlled study. MDA was found to increase self-report measures of mystical-type experience and other hallucinogen-like effects, including reported visual alterations. MDA produced a significant increase in closed-eye visions (CEVs), with considerable individual variation. Magnitude of CEVs after MDA was associated with lower performance on measures of contour integration and object recognition. Drug-induced visions may have greater intensity in people with poor sensory or perceptual processing, suggesting common mechanisms with other hallucinatory syndromes. MDA is a potential tool to investigate mystical experiences and visual perception.

Authors: Baggott, Matthew J.; Siegrist, Jennifer D.; Galloway, Gantt P.; Robertson, Lynn C.; Coyle, Jeremy R.; Mendelson, John E.


Protopine and allocryptopine increase mRNA levels of cytochromes P450 1A in human hepatocytes and HepG2 cells independently of AhR

2011-09-26

The isoquinoline alkaloids protopine and allocryptopine are present in...
At high concentrations, Cd causes damage to cells via a range of mechanisms. At low concentrations, Cd can stimulate expression of genes that are part of an adaptive response.

Nrf2-mediated adaptive response to cadmium (Cd) induced toxicity involves protein kinase C delta in human 1321N1 astrocytoma cells

2011-09-26

At high concentrations, Cd causes damage to cells via a range of mechanisms. At low concentrations, Cd can stimulate expression of genes that are part of an adaptive response. The astrocytoma cell line 1321N1 is used as a model to investigate the induction of protective enzymes in response to Cd. Expression of NAD(P)H:quinone oxidoreductase and haem oxygenase enzymes are induced as the protein level, and in response to 5 and 10 μM Cd. Levels of NQO1 and HO1 mRNA are also increased by following 24 hour exposure to 5 and 10 μM cadmium. An increase in the nuclear accumulation of the transcription factor Nrf2 was also observed following Cd treatment. Through the use of the protein kinase C inhibitor bisindolylmaleimide (VIII) acetate the authors have demonstrated the...
involvement PKC in the Nrf2-mediated response of 1321N1 cells to 5-10 nM Cd. Through the use of 10 nM rottlerin, PKCα is the isoform responsible for mediating this response.
Authors: Lawal, Akeem O.; Ellis, Elizabeth M.
Full Source: Environmental Toxicology and Pharmacology [online computer file] 2011, 32[1], 54-62 [Eng].

**Glucuronidation of zearalenone, zeranol and four metabolites in vitro: Formation of glucuronides by various microsomes and human UDP-glucuronosyltransferase isoforms**
2011-09-26
Glucuronidation constitutes an important pathway in the phase II metabolism of the mycotoxin zearalenone (ZEN) and the growth promotor R-zearalanol (R-ZAL, zeranol), but the enzymology of their formation is yet unknown. In the present study, ZEN, R-ZAL and four of their major phase I metabolites were glucuronidated in vitro using hepatic microsomes from steer, pig, rat and human, intestinal microsomes from humans, and eleven recombinant human UDP-glucuronosyltransferases (UGTs). After assigning chemical structures to the various glucuronides by using previously published information, the enzymic activities of the various microsomes and UGT isoforms were determined together with the patterns of glucuronides generated. All six compounds were good substrates for all microsomes studied. With very few exceptions, glucuronidation occurred preferentially at the sterically unhindered phenolic 14-hydroxyl group. UGT1A1, 1A3 and 1A8 had the highest activities and gave rise to the phenolic glucuronide, whereas glucuronidation of the aliphatic hydroxyl group was mostly mediated by UGT2B7 with low activity. Based on these in vitro data, ZEN, R-ZAL and their metabolites must be expected to be readily glucuronidated both in the liver and intestine as well as in other extrahepatic organs of humans and various animal species.
Authors: Pfeiffer, Erika; Hildebrand, Andreas; Mikula, Hannes; Metzler, Manfred.
Full Source: Molecular Nutrition & Food Research 2010, 54[10], 1468-1476 [Eng]

**Modulation of arsenic induced genotoxicity by curcumin in human lymphocytes**
2011-09-26
Arsenic contamination of ground water is a vital health concern in West
In this study, the authors continued with workplace contamination monitoring in the Alberta Cancer Board pharmacy practice environment.

In this study, the authors continued with workplace contamination monitoring in the Alberta Cancer Board (ACB) pharmacy practice environment. The ACB in the Canadian province of Alberta which includes two public tertiary centres and 19 associated community satellite sites based around the province in existing hospitals. After the completion of a Phase I and Phase II study, which investigated the feasibility of routine monitoring of antineoplastic agent contamination in the pharmacy practice environment, it was decided to launch a Phase III study. The Phase III study would be done at the Cross Cancer Institute in the main pharmacy department as well as at a brand new satellite pharmacy within the CCI hospital. Samples would be taken in these areas as well as on the outer exterior of latex gloves worn to prep. cyclophosphamide and other antineoplastics. The results showed that the area in front of the

Technical

Bengal, India, where nine districts were affected. Oxidative stress created by arsenic may lead to genetic instability which may in turn lead to initiation of carcinogenesis. Management of arsenic problem at the preclinical stage by utilising natural compounds could be a preventive strategy. The present study aims to bio-monitor the level of arsenic exposure in asymptomatic individuals by studying the DNA damage in lymphocytes and to use curcumin, an active ingredient of turmeric, in providing protection against arsenic toxicity. DNA damage was assessed by comet assay. Arsenic induced oxidative stress was observed by generation of reactive oxygen species (ROS). In vitro studies with human lymphocytes revealed that curcumin was effective in regression of arsenic induced ROS generation and thereby the DNA damage. The bio-monitoring of Chakdah block in West Bengal revealed that population residing in those areas exhibited severe DNA damage. When the same individuals were given curcumin for three months and monitored monthly, there was a remarkable regression in DNA damage as well as a reduction in ROS generation. Thus, curcumin may have some role in prevention and repair of the DNA damage caused by arsenic contaminated water.

Authors: Sinha, Dona; Mukherjee, Sutapa; Roy, Soumi; Bhattacharya, R. K.; Roy, Madhumita
Full Source: Journal of Environmental Chemistry and Ecotoxicology [online computer file] 2009, 1[1], 001-011 [Eng]

OCCUPATIONAL

Antineoplastic agent workplace contamination study: the Alberta Cancer Board pharmacy perspective phase III

2011-08-19

In this study, the authors continued with workplace contamination monitoring in the Alberta Cancer Board (ACB) pharmacy practice environment. The ACB in the Canadian province of Alberta which includes two public tertiary centres and 19 associated community satellite sites based around the province in existing hospitals. After the completion of a Phase I and Phase II study, which investigated the feasibility of routine monitoring of antineoplastic agent contamination in the pharmacy practice environment, it was decided to launch a Phase III study. The Phase III study would be done at the Cross Cancer Institute in the main pharmacy department as well as at a brand new satellite pharmacy within the CCI hospital. Samples would be taken in these areas as well as on the outer exterior of latex gloves worn to prep. cyclophosphamide and other antineoplastics. The results showed that the area in front of the
In this study the authors hypothesised that occupational exposure to bioaerosols can increase leakage of surfactant protein-D (SP-D), a lung-specific protein, into the bloodstream.

Full Source: International Archives of Occupational and Environmental Health 2011, 84(8), 817-826 (Eng)

Surfactant protein-D and exposure to bioaerosols in wastewater and garbage workers
2011-08-19
Purpose: Bioaerosols and their constituents, such as endotoxins, are capable of causing an inflammatory reaction at the level of the lung-blood barrier, which becomes more permeable. In this study the authors hypothesised that occupational exposure to bioaerosols can increase leakage of surfactant protein-D (SP-D), a lung-specific protein, into the bloodstream. SP-D was detected by ELISA in 316 wastewater workers, 67 garbage collectors, and 395 control subjects. Exposure was assessed with four interview-based indicators and by preliminary endotoxin measurements using the Limulus amoebocyte lysate assay. Influence of exposure on serum SP-D was assessed by multiple linear regression considering smoking, glomerular function, lung diseases, obesity, and other confounders. The results showed that overall, mean exposure levels to endotoxins were below 100 EU/m3. However, special tasks of wastewater workers caused higher endotoxin exposure. SP-D concentration was slightly increased in this occupational group and associated with the occurrence of splashes and contact to raw sewage. No effect was found in garbage collectors. Smoking increased serum SP-D. No clinically relevant correlation between spirometry results and SP-D concentrations was detected. The authors concluded that these findings support the hypothesis that inhalation of bioaerosols, even at low concentrations, has a subclinical effect on the lung-blood barrier, the permeability of which increases without associated spirometric changes.

Authors: Bigelow, Susan; Schulz, Heidi; Dobish, Roxanne; Chambers, Carole R.
Full Source: Journal of Oncology Pharmacy Practice 2009, 15(3), 157-160 (Eng)

In this study the authors hypothesised that occupational exposure to bioaerosols can increase leakage of surfactant protein-D (SP-D), a lung-specific protein, into the bloodstream.

Authors: Bigelow, Susan; Schulz, Heidi; Dobish, Roxanne; Chambers, Carole R.
Full Source: Journal of Oncology Pharmacy Practice 2009, 15(3), 157-160 (Eng)

biological safety cabinet in the main CCI pharmacy department as well as the exterior of the latex gloves showed evidence of cyclophosphamide contamination. The results from the sample taken in the new satellite pharmacy showed no evidence of cyclophosphamide contamination. The authors concluded that the findings from the present study have prompted a decision to launch a Phase IV study to determine the feasibility within the network, for routine monitoring as well as sampling throughout the clean room beyond the BSC.

Authors: Bigelow, Susan; Schulz, Heidi; Dobish, Roxanne; Chambers, Carole R.
Full Source: Journal of Oncology Pharmacy Practice 2009, 15(3), 157-160 (Eng)
In this study, the authors undertook an evaluation of antioxidant status by measuring the activities of superoxide dismutase and glutathione peroxidase and the concentrations of total reduced glutathione and protein-bound thiols in the serum. In addition, they measured urinary 8-hydroxy-2-deoxyguanosine (8-OHdG); which is used as biomarker of oxidative DNA damage in the mercury exposed persons. The study was carried out on 40 workers exposed to mercury on the job in collaboration with National Institute of Occupational Safety and Health. Samples were collected in December 2008 from workers at fluorescent lamps and dry batteries factories. Urinary 8-hydroxy-2-deoxyguanosine (8-OHdG) was measured used as biomarker of oxidative DNA damage in the mercury exposed persons. The antioxidant status was assessed by measuring the activities of superoxide dismutase and glutathione peroxidase and the concentrations of total reduced glutathione and protein-bound thiols were also evaluated in the serum. In this study, urinary 8-OHdG which is a metabolite of oxidised DNA was used to evaluate whether mercury exposure led to oxidative damage to DNA. The activities of serum GSH-Px and superoxide dismutase (SOD) and the concentrations of GSH and total protein-bound thiol were also investigated to clarify the relationship between body mercury status and oxidative stress. Forty subjects were chosen to participate in this study from workers exposed to mercury on the job. Ten healthy subjects, matching in age, sex and socio-economic status were chosen as a control group. There was increase in 8-OHdG concentrations in urine which means that DNA damage had occurred. The mercury exposed workers had significantly higher serum concentrations of GSH and protein-bound thiols than did the control groups. Serum and urinary mercury a concentration in the exposed group was more than 40 fold higher than in the controls. The author concluded that measurement of urinary 8-hydroxy-2-deoxyguanosine (8-OHdG) could be useful for evaluating in vivo oxidative DNA damage in the mercury exposed populations.

Author: Mohammed, A. A.
Full Source: Egyptian Journal of Biochemistry & Molecular Biology 2010, 28(2), 1-16 [Eng]
In the present study, the authors evaluated job histories of 2383 incident breast cancer cases diagnosed during 2000-2003, and 2502 controls who participated in a large population-based case-control study in Poland. Industrial hygienists reviewed occupational histories and developed exposure metrics for total organic solvents and benzene. Unconditional logistic regression analyses estimated ORs and 95% CIs as the measure of association with breast cancer, controlling for breast cancer risk factors. Stratified analyses examined the potential modification by known breast cancer risk factors. In addition, associations were evaluated by oestrogen and progesterone receptor status and by other clinical characteristics of the tumours using polytomous regression analyses. The results showed that women who ever worked at jobs with organic solvents exposure had a small, non-significant increase in breast cancer risk (OR 1.16; 95% CI 0.99 to 1.4). A significant association was present for oestrogen receptor- and progesterone receptor-negative tumours (OR 1.40; 95% CI 1.1 to 1.8), but there was no association with tumours with both positive receptors (OR 0.97; 95% CI 0.8 to 1.2 [p heterogeneity: 0.008]). We did not observe trends with increasing level of exposure. Known breast cancer risk factors did not modify the association between organic solvents and breast cancer risk. No association with breast cancer was found for benzene exposure (OR 1.00; 95% CI 0.8 to 1.3). The authors concluded that the results from this study provide weak evidence for a possible association between occupational exposure to organic solvents as a class and breast cancer risk. The association might be limited to hormone receptor-negative tumours.

Authors: Peplonska, Beata; Stewart, Patricia; Szeszenia-Dabrowska, Neonila; Lissowska, Jolanta; Brinton, Louise A.; Gromiec, Jan Piotr; Brzeznicki, Slawomir; Yang, Xiaohong R.; Sherman, Mark; Garcia-Closas,Montserrat; Blair, Aaron (Department of Environmental Epidemiology, Nofer Institute of Occupational Medicine, Lodz, Pol.). Occupational and Environmental Medicine 2010, 67(11), 722-729 (Eng), BMJ Publishing Group.
Incidence of extrapleural malignant mesothelioma and asbestos exposure, from the Italian national register

2011-08-19

The epidemiology of extrapleural malignant mesothelioma is rarely discussed and the risk of misdiagnosis and the very low incidence complicate the picture. This study presents data on extrapleural malignant mesothelioma from the Italian National Mesothelioma Register (ReNaM). ReNaM works on a regional basis, searching for cases and interviewing subjects to investigate asbestos exposure. Classification and code criteria for certainty of diagnosis and exposure modalities are set by national guidelines. Between 1993 and 2004, 681 cases were collected. Incidence measures and exposure data refer to the ReNaM database. Age-standardised rates were estimated by the direct method using the Italian resident population in 2001. Correlations between the incidence of pleural and non-pleural malignant mesothelioma for the 103 Italian provinces were analysed. Standardised incidence rates (Italy, 2004, per million inhabitants) were 2.1 and 1.2 cases for the peritoneal site (in men and women, respectively), 0.2 cases for the tunica vaginalis testis, and 0.1 in the pericardial site, varying widely in different parts of the country. Mean age at diagnosis for all extrapleural malignant mesothelioma cases was 64.4 years and the men/women ratio was 1.57:1. Median latency was over 40 years for all extrapleural sites combined. The correlation between pleural and peritoneal mesothelioma was 0.71 (Pearson’s r coefficient, p<0.001). Modalities of exposure to asbestos fibres were investigated for 392 cases. The authors concluded the rarity of the disease, the low specificity of diagnosis and difficulties in identifying the modalities of asbestos exposure call for caution in discussing etiological factors other than asbestos.

Authors: Marinaccio, Alessandro; Binazzi, Alessandra; di Marzio, Davide; Scarselli, Alberto; Verardo, Marina; Mirabelli, Dario; Gennaro, Valerio; Mensi, Carolina; Merler, Enzo; de Zotti, Renata; Mangone, Lucia; Chellini, Elisabetta; Pascucci, Cristiana; Ascoli, Valeria; Menegozzo, Simona; Cavone, Domenica; Cauzillo, Gabriella; Nicita, Carmela; Melis, Massimo; Iavicoli, Sergio

Full Source: Occupational and Environmental Medicine 2010, 67(11), 760-765 (Eng)
This study developed a job-exposure matrix (JEM) for fibre exposures in three asbestos textile plants and developed estimates of fibre size-specific exposures. Historical dust samples from three North Carolina, USA asbestos textile plants were obtained. Plant specific samples were used to express impinger dust concentrations as fibre concentrations by phase contract microscopy (PCM). Mixed models were used to estimate PCM exposures by plant, department, job and calendar time. Archived membrane filter samples were analysed by transmission electron microscopy (TEM) to determine the bivariate diameter/length distribution of airborne fibres by plant and operation. PCM fibre levels estimated from the models were very high in the 1930s, with some operations having in excess of 200 fibres/mL, and decreased appreciably over time. TEM results for 77 airborne dust samples found that only a small proportion of airborne fibres were measured by PCM (>0.25 um in diameter and >5 um in length) and the proportion varied considerably by plant and operation (range 2.9% to 10.0%). The bivariate diameter/length distribution of airborne fibres demonstrated a relatively high degree of variability by plant and operation. In addition, PCM adjustment factors varied substantially across plants and operations. The authors concluded that the findings from this study provide new information concerning airborne fibre levels and characteristics in three historically important asbestos textile plants. PCM concentrations were high in the early years and TEM data demonstrate that the vast majority of airborne fibres inhaled by the workers were shorter than 5 um in length, and thus not included in the PCM-based fibre counts.

Authors: Dement, J. M.; Myers, D.; Loomis, D.; Richardson, D.; Wolf, S.
Full Source: Occupational and Environmental Medicine 2009, 66(9), 574-583 (Eng)
This study presents the results of certain research regarding the influence of azo dyes and pigments used in the dyeing and printing of textiles, on health and, in particular, on the possibility of triggering certain allergic reactions or cancer.

Effects of azo dyes on human health
2011-08-19
This study presents the results of certain research regarding the influence of azo dyes and pigments used in the dyeing and printing of textiles, on health and, in particular, on the possibility of triggering certain allergic reactions or cancer. The development of carcinogenic amines is believed to be the major factor determining the carcinogenic potential of a given dye. In most cases, allergies have been caused by the utilisation of dispersion dyes on synthetic materials, meant for the manufacturing of textile items or toys which exhibited a low colour resistance. The dye extraction degree from textile materials varies depending on the number of washing/wear cycle the pH level, the perspiration acidity/alky., etc. In the manufacturing of dyes, an alternative to aromatic amines is the use of aromatic sulphonate amines, which do not have a genotoxic effect, or, if they do it is, in general, very low.

Authors: Leueca, Daciana Ilica
Full Source: Industria Textila (Bucharest, Romania) 2010, 61(6), 304-309 (Rom)
Multiple metals exposure in a small-scale artisanal gold mining community
2011-08-19
In this study, the authors characterise urinary metals in 57 male residents of a small-scale gold mining community in Ghana. Chromium and arsenic exceeded health guideline values for 52% and 34%, respectively, of all participants. About 10-40% of the participants had urinary levels of aluminium, copper, manganese, nickel, selenium, and zinc that fell outside the U.S. reference range. The authors concluded that exposures appear ubiquitous across the community as none of the elements were associated with occupation, age, and diet.
Authors: Basu, Niladri; Nam, Dong-Ha; Kwansaa-Ansah, Edward; Renne, Elisha P.; Nriagu, Jerome O.
Full Source: Environmental Research 2011, 111(3), 463-467 (Eng)

Identification of Flame Retardants in Polyurethane Foam Collected from Baby Products
2011-08-19
With the phase-out of PentaBDE in 2004, alternative flame retardants are being used in polyurethane foam to meet flammability standards; however, insufficient information is available on the identity of the flame retardants currently in use. Baby products containing polyurethane foam must meet California state furniture flammability standards, which likely affects the use of flame retardants in baby products throughout the US. It is not clear which products contain flame retardants and at what concentrations. This study investigated baby products containing polyurethane foam to assess how often flame retardants were used in these products. Information on when the products were purchased and whether they contained a label indicating the product meets requirements for a California flammability standard were recorded. When possible, the flame retardants being used and their in-foam concentrations were identified. Foam samples collected from 101 commonly used baby products were analysed. In total, 80 samples contained an identifiable flame retardant additive, and all but 1 was chlorinated or brominated. The most common detected flame retardant was tris(1,3-dichloroisopropyl) phosphate (TDCPP; detection frequency 36%), followed by components typically found in the Firemaster550 common mixture (detection frequency 17%). Five samples contained PBDE congeners commonly associated with PentaBDE, suggesting products with PentaBDE are still in-use. Two chlorinated organophosphate flame retardants (OPFR) not previously documented in the environment were also identified, one of which is commonly sold as...
The grading method is very important in the safety supervision and administration of major dangerous chemical hazard installations.

**SAFETY**

A simple and feasible grading method for major dangerous chemical hazard installations

2011-09-26

The grading method is very important in the safety supervision and administration of major dangerous chemical hazard installations. A new grading method is proposed in which R is a grading indicator. R is calculated by the ratios of different chemical quantities and their threshold quantities in the unit after correction of chemical categories and numbers of people. This method is applied in one enterprise and the results show that it has a certain degree of science and better operability, and can meet the need of the grading for major installations.

Authors: Wei, Li-jun; Wu, Zong-zhi

Full Source: Zhongguo Anquan Kexue Xuebao 2009, 19(12), 45-50 (Ch)
Determination of hazardous thresholds for chemical accidents
2011-09-26
The risk of fire and explosion is determined and the emergency exposure thresholds for common toxic substances are compared. Based on this, the hazardous threshold criteria for various accidents are classified according to the severity of the incident ranging from fatalities, irreversible effects and reversible effects. The technique can be applied to the fields of safety assessment, land use planning and emergency planning for major hazard installations or industrial zones.
Authors: Shi, Li-chen; Duo, Ying-quan.
Full Source: Zhongguo Anquan Kexue Xuebao 2009, 19(12), 51-56 (Ch)

Monitoring of personnel engaged in bomb disposal
2011-09-26
The benefits of deployed body sensor networks (BSNs) for bomb disposal personnel are assessed in terms of providing detailed physiological profiles of operatives; supporting online, real time extraction of accurate human thermal comfort values based on multiple sensor measurements; reporting of information to a remote station, thus enabling rapid assessment of hazardous situations; supporting automated control of cooling systems commonly integrated with armoured suits; and providing alerts to both operatives and remote monitors. BSNs deployed in this manner must be both robust and reliable in order to fulfil the safety criteria requirements of the application. The paper describes and evaluates a fully functional prototype instrumentation system which complies with these requirements.
Authors: Kemp, John; Gaura, Elena; Brusey, James.
Full Source: Nanotech Conference & Expo 2009: An Interdisciplinary Integrative Forum on Nanotechnology, Biotechnology and Microtechnology, Houston, TX, United States, May 3-7, 2009, 1, 517-520 (Eng).