

obtained, total % absorption including skin depot was $100\% - 10\% = 90\%$. Published soil contaminant data from our laboratory and from a pilot study with 16 polycyclic aromatic hydrocarbons (PAHs) were evaluated.

Methodology: In vitro Bronaugh Teflon flow-through diffusion cells held human breast skin with Hanks receiver containing 4% bovine serum albumin. For published data study, radiolabeled contaminants were applied both without soil, or spiked into gardening soil. For pilot study, unlabeled PAHs were applied without soil or with unspiked soil from a contaminated site. In both studies, skin was soap washed at 24 hours.

Results/Impact/Outcomes: In the published data study, inverse correlations with % soap wash versus % absorption with R^2 values of 0.88 ($n = 6$), and 0.96 ($n = 6$) were obtained with and without soil, respectively, supporting "by difference" method validity. In the PAHs study, inverse correlations with % dermal absorption predicted "by difference" versus PAH lipophilicity were obtained with R^2 values of 0.92 ($n = 5$) and 0.57 ($n = 11$) with and without soil, respectively, suggesting optimal absorption lipophilicity was exceeded.

Conclusions and Discussion: Overall data suggest that the "by difference" method provides a precautionary, cost-effective alternative to standard in vitro tests. Further method validation is required.

Predictors of Dermal Exposures to Polycyclic Aromatic Compounds among Asphalt Paving Workers

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Objectives: To identify the sources and work practices that affect dermal exposure to polycyclic aromatic compounds (PACs) among asphalt paving workers.

Methods: Twelve workers were monitored for 3 days/week for 4 weeks. Two weeks were under normal conditions with regard to dermal exposures. In the third week, biodiesel was substituted for diesel oil as a cleaning agent, and in the fourth week, workers were supplied dermal protection (gloves, neck cloth, clean long shirts and pants). Dermal exposure to PACs was quantified by a passive organic dermal (POD) sampler specifically developed for this study and a sunflower oil hand wash (HW) technique. Linear mixed effects models were used to evaluate predictors of PAC exposures.

Results: Dermal exposures were low such that most analytes were rarely detected above the LOD, with the

exception of phenanthrene (Phen) and pyrene (Pyr). The geometric mean (GM) concentrations of Phen were 0.69 ng/cm^2 on the POD sample and 1.37 ng/cm^2 in the HW sample. GM concentrations of Pyr were 0.30 ng/cm^2 on the POD sample and 0.29 ng/cm^2 in the HW sample. Increasing frequency of glove use was associated with significant reductions in exposure ($p < .0001$) that ranged from 40 to 90% by analyte and method. Similar reductions in HW Phen ($p = .01$) and Pyr ($p = .003$) concentrations were observed when biodiesel was substituted for diesel oil. Higher asphalt temperatures were found to significantly increase exposure ($p = .01$).

Conclusion: Reductions in dermal exposure to PACs among pavers can be achieved with increased dermal coverage and substituting biodiesel for diesel oil as a cleaning agent. Additional reductions may be possible by decreasing the application temperature of asphalt.

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To Investigate Some Manifestations of Allergic Reactions in People Exposed to Chemicals

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This study was carried out to investigate some manifestations of allergic reactions in people exposed to chemicals.

Three thousand four hundred twenty-eight (3,428) subjects, who lived in the same area of industrial zone of PT province were interviewed. Among them, 192 subjects had exposure to chemicals when working, and 3,236 subjects belong to the non-exposed group. The result showed that the rate of subjects having some manifestation of allergic reaction of body organs (skin, eye, nose, throat...) in the exposed group was significantly higher than among those in the non-exposed group ($p < .001$). The study also finds out the relation between feeling of polluted environmental degree and some manifestation of allergic reaction of body organs clearly ($p < .001$).

It is necessary to apply some methods to protect people's health.

Determining Dermal Absorption of Nanoparticles Using a Novel In Vitro Flexing Skin Model (Cutaflex)

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