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### **Dermal Exposure Research Program**

*S.C. Soderholm, H.W. Ahlers, M.F. Boeniger, B.D. Lushniak*

National Institute for Occupational Safety and Health

Estimates indicate that more than 13 million workers in the United States are potentially exposed to chemicals that can be absorbed by the skin. A worker's skin may be exposed to hazardous chemicals through direct contact with contaminated surfaces, deposition of aerosols, immersion, or splashes. When substantial amounts of chemicals are absorbed, systemic toxicity can result. Contact dermatitis can also result when chemicals are absorbed through a worker's skin. Contact dermatitis is one of the most common chemically induced causes of occupational illness, accounting for 10 to 15 percent of all occupational illnesses at an estimated annual cost of at least \$1 billion.

The National Institute for Occupational Safety and Health (NIOSH) and approximately 500 external partners created the National Occupational Research Agenda (NORA) to guide occupational safety and health research in the nation. As part of NORA, NIOSH encouraged its intramural researchers to join together to develop large scale programs in and across NORA priority areas. One of the three interdisciplinary cross-divisional priority program areas funded in 2000 was the development of dermal policy based on laboratory and field studies. The overall goal of this program is to promote the development of improved NIOSH policies and recommendations for identifying and controlling dermal overexposures and dermatitis. This goal will be accomplished by (1) adding critical information to our current knowledge base through laboratory and field investigations and (2) developing and applying scientific decision-making processes for policy development using that knowledge base. For simplicity, this program is frequently called the NORA Dermal Exposure Research Program (NORA DERP).

There are currently eight research projects in the program contributing information in such areas as developing biomonitoring methods; developing colorimetric methods; conducting case studies in the field relating to exposure assessment, intervention evaluation and engineering controls; developing improved mathematical relationships to predict percutaneous penetration and sensitization potential; conducting laboratory studies of decontamination and penetration; and developing recommendations for improving current NIOSH skin notations. One core project applies the Local Lymph Node Assay (LLNA) to predict the sensitization potential of pure chemicals and mixtures. Another core project coordinates the program and encourages scientific forums on dermal exposure issues.

Highlights of accomplishments include improved measurement and analysis methods, protocols for field studies, funding to encourage other researchers to enter this field, as well as leadership for a series of international conferences with representatives of governments, industry, labor and academia in North and South America, Europe, Africa, Asia and Australia. This presentation describes the objectives, research accomplishments and anticipated impact of each of the 10 projects in the NORA Dermal Exposure Research Program. Having completed approximately one-third of the proposed lifetime of this Program, we anticipate significant progress in the next few years toward the improvement of NIOSH recommendations for identifying and controlling chemical over-exposures to the skin of workers.

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# NORA Symposium 2003



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