

## International conference focuses on isocyanates and health

By Paula Whitacre

From foam insulation to sealants, mattresses to bowling balls, isocyanates are everywhere as a component of polyurethane products. Although it is known that exposure to isocyanates can induce sensitization and asthma in workers who handle them unsafely, many questions still remain. Are there other health effects, such as certain cancers, related to isocyanate exposure? How can isocyanate occupational exposures be measured and reduced, especially among workers in less-regulated, often small-scale enterprises in the United States and around the world? Can consumers also experience health effects from exposures to various household and do-it-yourself products?

An international conference, *Isocyanates and Health: Past, Present, and Future*, (<http://www.isocyanates2012.org/content/home.cfm>) brought together scientists, regulators, worker representatives, industry representatives, clinicians, and others to answer these and other questions April 3-4 in Potomac, Md. NIEHS, along with other U.S., Canadian, and European professional societies, government agencies, and companies, co-sponsored the conference.

Aubrey Miller, M.D., NIEHS senior medical advisor, discussed NIEHS-supported research and collaborations. His team also hosted an NIEHS exhibit during the conference poster sessions.

“The purpose of the conference was to identify and discuss the latest knowledge and best evidence, and to identify research gaps,” said James Lockey, M.D., of the University of Cincinnati College of Medicine and scientific chair of the conference. “It was important that we include all the stakeholders at the table.” According to Lockey and several other attendees, it was the first international multistakeholder conference to focus on isocyanates since 2001.

### Polyurethane: promise and peril

As ubiquitous as polyurethane is now, it was invented in 1937 by German chemist Otto Bayer. It soon became widely used, because of its versatility and utility, according to keynote speaker Sharon Feng, Ph.D., of the University of Chicago. Different isocyanate compounds, most commonly toluene diisocyanate (TDI) and methylene bisphenyl isocyanate (MDI), are used, depending on the desired qualities of the final product.

From a health and safety perspective, Feng emphasized, “Isocyanates are reactive chemicals that need to be handled in a safe manner.” How to handle them safely under various conditions, how to assess and communicate the risks, and how to find answers to the many unknowns about exposure, biomarkers, and other issues ran through the rest of the conference.

Over two days, the conference included plenary overviews and discussions, along with oral and poster presentations. The specific research findings covered six thematic areas:

- Worker and consumer exposure issues
- Toxicity testing, animal models, and biomarkers
- Human cancer risk
- Environmental exposure and monitoring
- Respiratory epidemiology and disease
- Occupational health surveillance and management



Lockey, scientific chair of the *Isocyanates and Health* conference, opened the meeting by reviewing the goals with participants. (Photo courtesy of Halvor Erikstein)



Feng provided an overview of the past, present, and future of isocyanates. (Photo courtesy of Halvor Erikstein)



Multistakeholder participation in the conference enriched the discussion. Andrew Comai, standing, an industrial hygienist with the UAW International Union Health and Safety Department, gave a report from a breakout session to the plenary. (Photo courtesy of Halvor Erikstein)



At a follow-up workshop, Miller discussed NIEHS models of research collaboration. (Photo courtesy of Paula Whitacre)

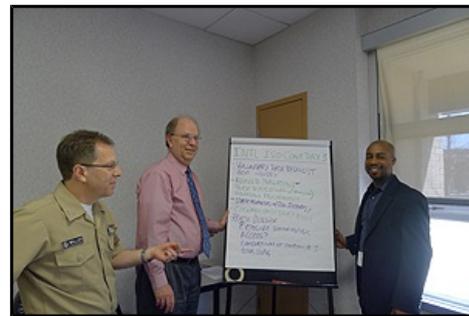
The diverse ways that participants interact with isocyanates in their work, both indirectly or directly, enriched the discussions concerning research gaps and future priorities. At the end of the conference's second day, chairs of the thematic areas reported out draft lists of research priorities, based on the discussions and a pre-conference survey. The meeting summary and research priorities will be published in the *Journal of Occupational and Environmental Medicine*.

## Moving forward

A workshop for agency representatives, chairs of the thematic areas, and the conference planning committee immediately followed the larger two-day conference. According to facilitator Andrew Maier, Ph.D., of Toxicology Excellence for Risk Assessment (TERA), the workshop was designed to share information on different models of collaboration and leveraging of resources to enhance the impact of research funding on isocyanates and health.

Representatives from several organizations involved in collaborations and partnerships, including NIEHS, explained their models for possible use or expansion related to isocyanates. Miller said, the NIEHS mission and priority areas encompass isocyanate activity and research, including the Worker Education and Training Program, the National Toxicology Program, and funded research focusing on neurotoxicity and the development of biomarkers of isocyanate exposure.

(Paula Whitacre is a contract writer with the NIEHS office in Bethesda, Md.)



*From left to right, Miller; Pertti (Bert) Hakkinen, Ph.D., of the National Library of Medicine; and Gary Ellison, Ph.D., of the National Cancer Institute, helped brainstorm ideas for moving forward and leveraging resources related to isocyanates research. (Photo courtesy of Paula Whitacre)*

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