# Greenlist Bulletin

From the Toxics Use Reduction Institute
at the University of Massachusetts Lowell

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This is the weekly bulletin of the TURI Library at the University of Massachusetts Lowell. Greenlist Bulletin provides previews of recent publications and websites relevant to reducing the use of toxic chemicals by industries, businesses, communities, individuals and government. You are welcome to send a message to mary@turi.org if you would like more information on any of the articles listed here, or if this email is not displaying properly.

## Is Your Phone Smart Enough to Not Poison the People Recycling It? This One Is

Source: *Yes!*, October 11, 2013
Author: Chris Sweeney

When Ted Smith looks at a smartphone, he doesn't see a multipurpose gadget. He sees faces. He sees the face of the Indonesian or Ugandan miner who unearthed the raw materials. He sees the face of the factory worker who lives on a corporate campus in China and works long shifts, exposed to hazardous chemicals while assembling miniscule components. He sees the face of the salesperson at Best Buy or Target, and the face of the customer. He sees the faces of those who encounter the product after it's been jettisoned and shipped halfway around the world to regions awash in electronic waste. . . .

From mining to manufacturing to recycling, consumers, corporations, and governments need to rethink the life of our devices from beginning to end.

Imagine a phone that's made using conflict-free minerals and is encased in a shell made of nontoxic chemicals. Imagine if that same phone, which looks and works like every other touchscreen smartphone on the market, was manufactured under the supervision of labor-rights organizations and in close collaboration with an established, reputable e-waste recycler that made sure every reusable and recyclable component was recovered safely.

Read more...

Read about the Lowell Center for Sustainable Production's Sustainable Mobile Phone Design Charrette.

## Getting Real About Chemical Risk: Predictive Models for Hazards and Exposure Improve, But Gaps Remain

Source: *Chemical & Engineering News*, October 14, 2013
Author: Britt E. Erickson

Many people assume that the chemicals in their detergents, floor cleaners, and other household products have undergone rigorous safety testing. But little is known about the potential risks associated with most of the estimated 80,000 chemicals in commerce today.

While industry tries to dispel links to illnesses that go beyond what science can prove, the public is skeptical because companies have a financial stake in showing their products are safe. This leads both sides to look to the federal government for help.

The agency charged with overseeing the safety of chemicals in the marketplace is the Environmental Protection Agency. EPA has the authority to require industry to provide extensive toxicity data for pesticides. But for most other chemicals, EPA must show that a substance is likely to be a risk to human health or the environment in order to require industry to provide safety data. Manufacturers don't often give toxicity data to EPA voluntarily, nor does the agency have the resources to assess tens of thousands of chemicals using traditional in vivo rodent-based studies.

Instead, EPA has turned to computational modeling. One ambitious effort, called ToxCast, aims to screen thousands of chemicals for biological activity using about 600 high-throughput biochemical and cell-based assays. The data are then integrated with existing in vivo animal toxicity data and structure-activity information to predict toxicity.

Read more...

## Toward a more water-based chemicals industry

Source: Phys.org, October 17, 2013

While all areas of human activity have an impact on the environment, the chemicals industry is often singled out as a particularly poor environmental performer, associated with high energy consumption and the generation of large quantities of toxic waste products.

Thus, as chemical production continues to increase, the global industry faces both economic and environmental pressures, and growing regulatory constraints. Much of the concern revolves around the widespread use of powerful and dangerous solvents.

EU project AQUACHEM ("Transition metal chemistry and catalysis in aqueous media") was established to examine the substitution of dangerous solvents with chemical catalytic processes compatible with water-based media -- and also to provide young scientists with more experience in the field.

The network, led by Italy's National Research Council, is allowing scientists, including those just starting their careers, to conduct research at some of Europe's top laboratories. The project also included labs in the UK, France, Germany, Spain, Hungary and Israel.

Read more...

## Insulin Resistance and Environmental Pollutants: Experimental Evidence and Future Perspectives

Source: *Environmental Health Perspectives*, September 20, 2013
Authors: Tine L.M. Hectors, Caroline Vanparys, Luc F. Van Gaal, Philippe G. Jorens, Adrian Covaci, and Ronny Blust

Background: The metabolic disruptor hypothesis postulates that environmental pollutants may be risk factors for metabolic diseases. Because insulin resistance is involved in most metabolic diseases and current health care prevention programs predominantly target insulin resistance or risk factors thereof, a critical analysis of the role of pollutants in insulin resistance might be important for future management of metabolic diseases.

Objectives: We aim at critically reviewing the available information linking pollutant exposure to insulin resistance and intend to open the discussion on future perspectives for metabolic disruptor identification and prioritization strategies.

Methods: PubMed and Web of Science were searched for experimental studies reporting on linkages between environmental pollutants and insulin resistance. A total of 23 studies were identified as the prime literature.

Discussion and conclusions: Recent studies specifically designed to investigate the effect of

pollutants on insulin sensitivity show a potential causation of insulin resistance. Based on these studies, a table of viable test systems and endpoints can be composed which allows ... insight into what is missing and what is needed to create a standardized insulin resistance toxicity testing strategy. It is clear that current research predominantly relies on top-down identification of insulin resistance-inducing metabolic disruptors and that one of the major future research needs is the development of dedicated *in vitro* or *ex vivo* screens to allow animal sparing and time- and cost-effective bottom-up screening.

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## Molecular Competition: Flame Retardants Interact with Key Metabolism Enzyme

Source: *Environmental Health Perspectives*, October 2013
Author: Kellyn S. Betts

Using X-ray crystallography to visualize the three-dimensional structure of an enzyme associated with regulating levels of estrogen, a team of National Institutes of Health scientists have discovered new information on how flame retardants may alter estrogen metabolism. Their results suggest one way in which these chemicals may disrupt the body's endocrine system.

Flame retardants are added to foam, textiles, electronics, building materials, and other items to reduce flammability. The new research focuses on tetrabromobisphenol A (TBBPA), currently the most heavily produced flame retardant in the world, and 3-OH-BDE-47, a metabolite of the Penta bromodiphenyl ethers (PentaBDEs), which were widely used prior to 2004 and remain in many long-lived consumer goods. . . .

The new research shows how both TBBPA and 3-OH-BDE-47 can bind to an enzyme known as estrogen sulfotransferase (SULT1E1). This enzyme's job is to bind the major endogenous estrogen 17β-estradiol and add a sulfate molecule to it; the sulfated estradiol is more readily eliminated from the body. "Basically, the flame retardants are going to compete with estradiol for binding to the sulfotransferase," says coauthor Linda Birnbaum, director of the National Institute of Environmental Health Sciences (NIEHS). The result may be to raise levels of estradiol in the body, explains corresponding author, Lars Pedersen of the NIEHS Laboratory of Structural Biology.

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Also note that EPA's Design for the Environment Program (DfE) has announced its plan to update the DfE Alternatives Assessment for flame retardants in flexible polyurethane foam. The original report from 2005 was known as the Furniture Flame Retardancy Report. In the updated report, seventeen chemicals and two proprietary blends will be evaluated. A list of chemicals that DfE does not plan to evaluate has also been compiled. These lists are now available for review. EPA developed these lists based on stakeholder input on use patterns for flame retardants in flexible polyurethane foam.

## River otters as biomonitors for organochlorine pesticides, PCBs, and PBDEs in Illinois

Source: *Ecotoxicology and Environmental Safety*, October 10, 2013
Authors: Samantha K Carpenter, Nohra E. Mateus-Pinilla, Kuldeep Singh, Andreas Lehner, Damian Satterthwaite-Phillips, Robert D. Bluett, Nelda A. Rivera, Jan E. Novakofski

The North American river otter (*Lontra canadensis*) is a biomonitor for organohalogenated compounds (OHCs) associated with a wide range of deleterious health effects in wildlife and humans. We determined concentrations of twenty OHCs in livers of 23 river otters salvaged by the Illinois Department of Natural Resources from 2009 to 2011, determined sex-dependent distribution of OHCs, and compared our results to the reported concentrations of four OHCs in Illinois river otters from 1984 to 1989. Since these contaminants have been banned for over 30 years, we predicted smaller mean concentrations than those previously reported in Illinois otters. We detected eleven of twenty OHCs; PCBs (polychlorinated biphenyls), dieldrin, and 4,4'-DDE (dichlorodiphenyldichloroethylene) were present in the greatest mean concentrations. We report the largest mean concentration of dieldrin to date in the liver of North American river otters (mean: 174, range: 14.4-534 parts per billion wet wt [ppb]). Mean PCB concentrations were significantly higher in males (mean: 851; range: 30-3450 ppb) than females (mean: 282; range: 40-850 ppb; $p$=0.04). Mean concentrations of dieldrin were greater than those detected in otters from 1984 to 1989 (mean: 90; range: 30-130 ppb; $p$<0.05). Our results suggest OHC exposure remains a concern. Future research in Illinois should focus on evaluating OHCs exposures, particularly dieldrin, at the watershed level.

Read more...

For a nontechnical summary of the study's findings, see this article at One Green Planet: "River Otters Exposed to 'Banned' Chemicals."

Dieldrin is listed on The Endocrine Disruption Exchange's (TEDX's) List of Potential Endocrine Disruptors. A recent editorial from the *New York Times*, "This Is Your Brain on Toxins," discusses the issue of endocrine-disrupting chemicals and its growing attention among scientists, industry, regulators, and the media.

## Have a Blast Cleaning Parts

Source: *Products Finishing*, October 1, 2013
Author: Rick Roth

The concept of the wet blasting process in parts cleaning and surface finishing is straightforward enough: combine abrasive media with water to form a special slurry, then add regulated compressed air to control the pressure as it is discharged over a surface.

It is a dust-free and static-free process that removes burrs, scale, oxidation and rust, marks, paint, and coatings. It can also remove oils and grease while performing other functions such as preparing the surface for other coatings or processes.

Today, matte finishes are a popular choice for parts-often for both practical and cosmetic reasons. Automated slurry-blasting machines are a great choice for achieving fine, non-directional matte finishes in a single operation. Depending on the application, profiles of less than 4 Ra are possible, and users can choose from various media, including glass beads, ceramic or plastics.

The slurry-blast process virtually eliminates embedded media issues commonly found in dry blasting systems. The water and slurry are recirculated, requiring no drain hookup. The process does not create dust, and chemicals are not required, adding to its appeal for manufacturers committed to limiting their environmental impact.

Read more...

See also from *Products Finishing*, Progress in Replacing Decorative Electroplating Chrome Coatings on Plastics with Physical Vapor Deposition Coatings.

View this press release on the upcoming New England Surface Finishing Regional event.

## Leading Companies, Universities and NGOs Support New Principles for Safer, Healthier Products

Source: BizNGO, EDF, LCSP, and TURI, October 17, 2013

Framingham, Massachusetts -- Today a broad and diverse community of individuals from companies, universities, governments, and environmental health groups signed on to The Commons Principles for Alternatives Assessment -- a solutions-based framework to guide retailers and product manufacturers in reducing hazardous chemicals and continuously improving the safety of products.

In signing the statement, over 100 signatories took a stand for safer, healthier products. BizNGO, Environmental Defense Fund, Lowell Center for Sustainable Production and Massachusetts Toxics Use Reduction Institute led the development and launch of the Principles.

The Commons Principles for Alternative Assessment establish reducing hazard as a key criterion for evaluating safer alternatives to toxic chemicals. As Roger McFadden, Senior Scientist and Vice President at Staples, Inc. emphasized, "We need a consistent and replicable framework for alternatives assessment. The Commons Principles give us an approach that starts from the inherent hazards of chemicals and progresses into economic and broader environmental concerns. This helps inform materials selection, reduce risks and drive innovation."

Read more...

Also view TURI's webpage about the Principles of Alternatives Assessment.

Please send a message to mary@turi.org if you would like more information on any of these resources. Also, please tell us what topics you are particularly interested in monitoring, and who else should see Greenlist. An online search of the TURI Library catalog can be done at http://library.turi.org for greater topic coverage.

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