

Greenlist Bulletin

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

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This is the bi-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.



Toxicity Assessment of 4-Methyl-1-cyclohexanemethanol and Its Metabolites in Response to a Recent Chemical Spill in West Virginia, USA

[Source: Environmental Science & Technology, May 11, 2015](#)

Authors: Jiaqi Lan, Man Hu, Ce Gao, Akram Alshawabkeh, and April Z. Gu

The large-scale chemical spill on January 9, 2014 from coal processing and cleaning storage tanks of Freedom Industries in Charleston affected the drinking water supply to 300,000 people in [the] Charleston, West Virginia metropolitan [area], while the short-term and long-term health impacts remain largely unknown and need to be assessed and monitored. There is a lack of publically available toxicological information for the main contaminant 4-methyl-1-cyclohexanemethanol (4-MCHM). Particularly, little is known about 4-MCHM metabolites and their toxicity. This study reports timely and original results of the mechanistic toxicity assessment of 4-MCHM and its metabolites via a newly developed quantitative toxicogenomics approach, employing proteomics analysis in yeast cells and transcriptional analysis in human cells. These results suggested that, although 4-MCHM is considered only moderately toxic based on the previous limited acute toxicity evaluation, 4-MCHM metabolites were likely more toxic than 4-MCHM in both yeast and human cells, with different toxicity profiles and potential mechanisms. In the yeast library, 4-MCHM mainly induced chemical stress related to transmembrane transport and transporter activity, while 4-MCHM metabolites of S9 mainly induced oxidative stress related to antioxidant activity and oxidoreductase activity. With human A549 cells, 4-MCHM mainly induced DNA damage-related biomarkers, which indicates that 4-MCHM is related to genotoxicity due to its DNA damage effect on human cells and therefore warrants further chronic carcinogenesis evaluation.

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Also see article in *The Charleston Gazette*, "[Study warns of MCHM toxicity](#)".

Scientific Discovery Reverses Gray Hair To Its Natural Color - Invented By The Warner Babcock Institute

[Source: Warner Babcock Institute, April 3, 2015](#)

The Nature of Hair, LLC (dba Hairprint) announce the commercial availability of Hairprint®, a revolutionary treatment for the reversal of gray hair. Hairprint restores gray hair to its natural color in 90 minutes by mirroring the natural process of hair pigmentation. This innovative treatment is the result of research by the Warner Babcock Institute for Green Chemistry LLC (WBI), inspired by principles of Green Chemistry and biomimicry, and is now available from Hairprint under exclusive license. ...

Using technology invented by Dr. John Warner and patented by WBI, Hairprint is the only product on the market with this revolutionary approach to gray hair. Rather than trying to dye gray hair, an invasive process involving a long list of chemicals, Dr. Warner took another approach and created a treatment that restores what is missing from gray hair: the natural pigment eumelanin. How does Hairprint restore hair color? Every strand of hair has a unique internal structure that determines the configuration of pigment in hair. This "hairprint" is as distinctive as a fingerprint. When Hairprint is applied, the natural pigment reintegrates into the cortex restoring original hair color.

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These 4 Chemicals May Pose the Most Risk for Nail Salon Workers

[Source: Scientific American, May 12, 2015](#)

Author: Dina Fine Maron

As the nation's 375,000 nail technicians buff, polish and file our fingers and toes, that workplace exposure to chemicals in the polish and glue can pose a real threat. But it's not just the amount of those substance that can turn them toxic, it is also the way they get into workers' bodies.

Workplace conditions in certain nail salons, expertly laid out last week in an investigation by *The New York Times's* Sarah Maslin Nir, can alleviate or exacerbate these issues. Chemicals inside of the glues, removers, polishes and salon products -- which technicians are often exposed to at close proximity and in poorly ventilated spaces -- can be hazardous individually. When combined, however, they could potentially cause even greater harm. Yet it is difficult to know how these chemicals affect the body because current evaluations do not look at these substances comprehensively. There are also few reports looking at how each compound individually affects nail workers.

[Read more...](#)

Also see from *The New York Times*, "[Cuomo Orders Emergency Measures to Protect Workers at Nail Salons](#)".

TURI's Note: See our web page on [Nail and Hair Salons](#), which includes resources for workers and salon owners, as well as information on a past community grant project. Also see the Boston Public Health Commission's [Safe Nail Salons](#) page.

Chemical reactions: glyphosate and the politics of chemical safety

[Source: The Guardian, May 13, 2015](#)

Author: Patrick van Zwanenberg

Glyphosate, the world's most widely used herbicide, hit the headlines in March after the International Agency for Research on Cancer (IARC) announced that it is a "probable human carcinogen".

The IARC, which is responsible for providing an evidence base for the cancer control policies of the World Health Organisation and its members, had completed a year long review of the scientific literature on the herbicide. It found "convincing evidence" that glyphosate causes cancer in laboratory animals, "limited evidence" that it does so in agricultural workers, and evidence that it causes DNA and chromosomal damage in human cells.

The IARC's evaluation is hugely important because it is sharply at odds with the views of the world's major regulatory agencies. Last year, an evaluation by German government regulators, on behalf of the European Commission, concluded that there was no evidence that glyphosate is carcinogenic or mutagenic, or that the herbicide posed any other serious hazard to health. All other regulatory agencies have reached similar conclusions.

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Opinion on persistency and bioaccumulation of Octamethylcyclotetrasiloxane (D4) and Decamethylcyclopentasiloxane (D5)

Source: [European Chemicals Agency, April 22, 2015](#)

After examination of the information provided by the UK-CA [United Kingdom - Competent Authority] and the comments related to the persistence and bioaccumulation of D4 and D5 raised during the call for evidence, [Member State Committee] (MSC) agreed that a scientifically robust conclusion can be drawn, similar to an SVHC agreement. The available information shows that the substances D4 and D5 meet the criteria for vB and for vP as defined in the REACH Regulation (EC) No 1907/2006.

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Ultrasonic Acoustically Assisted Inline Drying for Waterborne Wood Coatings

Source: [Paint & Coatings Industry, April 1, 2015](#)

Author: Anthony Carignano

The use of ultrasonic acoustic waves and their effect on the drying and film performance of industrial inline coatings is supported by a broad and growing body of research. Over the past decade, commercial acceptance of ultrasonic acoustically assisted (USAA) heat and mass transfer drying has grown rapidly in consumer product inline converting applications such as printing and adhesive lamination. USAA drying provides energy cost savings, increased throughput and reduced footprint. It has also proven to be a unique fit for niche applications, such as cold seal adhesives in which drying completeness is critical for tack. Although USAA drying has been successfully evaluated as an energy-efficient drying method for certain high free-moisture-content wood species, the relationship between waterborne coatings, wood substrates and USAA drying remains uncharted.

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Also see from *PCI*, "[Waterborne Polyurethane Dispersions with New Sustainable Solvent](#)".

UN Negotiators Eschew Consensus to Ban Toxic Chemical, Adopt E-Waste Guidelines

Source: [Bloomberg BNA, May 19, 2015](#)

Author: Bryce Baschuk

May 18 -- International chemicals negotiators in Geneva broke a quarter century of precedent and banned a toxic chemical despite opposition from a member country during the conference of parties of the Basel, Rotterdam and Stockholm conventions.

Parties to the Stockholm Convention -- which bans the production, use and trade of certain persistent organic pollutants (POPs) -- voted May 16 to prohibit pentachlorophenol, a wood preservative that is linked to brain damage and increased risk for cancer. The ban takes place despite strong opposition from India, a party to the convention. ...

Pentachlorophenol is now listed under Annex A of the Stockholm Convention with specific exemptions for utility poles and their cross-arms. India had asked members to also create an exemption from the ban for the use of the wood preservative in the production of medium-density fiber board and in impregnated particle boards for at least 10 years, but that request was denied.

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Dow Develops Chromium-Free Ecoposit Etching for Sustainable Plating on Plastic Manufacturing

Source: [World Industrial Reporter, December 9, 2014](#)

Dow Electronic Materials, a business unit of the Dow Chemical Company, has developed a novel chromium-free Ecoposit etching solution for sustainable plating on plastic manufacturing.

The new solution will replace chromic acid etching that is being used in the pre-treatment of Acrylonitrile Butadiene Styrene (ABS) and PC-ABS in the plating on plastics (POP) industry, helping manufacturers to meet the September 21, 2017 sunset date set by REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) – the EU's chemical regulatory arm – to eliminate the use of chromium trioxide.

The selection of a replacement etchant species was the result of many years of research to find a candidate and associated process parameters, with the stability, performance and process window to substantially fit into existing POP equipment. Dow's novel Ecoposit Etch becomes an integral part of the Ecoposit CF-800 Chrome-Free pre-treatment, utilizing the stable and regenerable MnIII species to replace the incumbent hexavalent chromium oxidant.

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Nanocoating on buildings releases potentially toxic particles to the air

[Source: European Commission, May 28, 2015](#)

Author: Martin Morgeneyer

Photocatalytic coatings containing nano-sized particles of titanium dioxide are increasingly applied to the outside of buildings for their antibacterial and self-cleaning properties. Weathering and wear can cause them to disintegrate and there are concerns about the subsequent release of nanoparticles into the environment. Various studies have found that some types of titanium dioxide nanoparticles have damaging effects on humans and animals. For example, experiments have shown that they can damage DNA.

This study investigated weathering and wear's effects on a photocatalytic nanocoating to help predict levels of nanoparticle release into water and air. The coating was comprised of 1.1% titanium dioxide particles by volume, which were around 8 nanometres in size.

Over a seven-month period, the researchers exposed a brick painted with the coating to UV light and water to recreate the effects of weather. At four intervals -- two, four, six and seven months -- they measured titanium levels in the runoff water. Titanium was measured as it is not possible to measure the relative number or percentage of titanium dioxide nanoparticles specifically. However, the coating's nanoparticles were the only type of titanium in the experiments.

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See original article in *Environmental Science & Technology*, "[Emission of Titanium Dioxide Nanoparticles from Building Materials to the Environment by Wear and Weather](#)".

Nanomaterials in Boat-Bottom Coatings Leave Marine Life Vulnerable

[Source: Paint & Coatings Industry, May 25, 2015](#)

DAVIS, CA -- Nanomaterials commonly used in sunscreens and boat-bottom coatings are making sea urchin embryos more vulnerable to toxins, according to a study from the University of California, Davis. The authors said this could pose a risk to coastal, marine and freshwater environments.

The study, published in the journal *Environmental Science and Technology*, is the first to show that the nanomaterials work as chemosensitizers. In cancer treatments, a chemosensitizer makes tumor cells more sensitive to the effects of chemotherapy.


Similarly, nanozinc and nanocopper made developing sea urchin embryos more sensitive to other chemicals, blocking transporters that would otherwise defend them by pumping toxins out of cells.

Nanozinc oxide is used as an additive in cosmetics such as sunscreens, toothpastes and beauty products. Nanocopper oxide is often used for electronics and technology, but also for antifouling coatings.

[Read more...](#)

See original article in *Environmental Science & Technology*, "[Copper Oxide and Zinc Oxide Nanomaterials Act as Inhibitors of Multidrug Resistance Transport in Sea Urchin Embryos: Their Role as Chemosensitizers](#)".

Also see from *ChemicalWatch*, "[Swedish chemicals agency to draft nanomaterial registry](#)".



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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