

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.

Are plastic chemicals in dads hurting embryos?

Source: Environmental Health News, December 7, 2016

Author: Brian Bienkowski

Turns out, moms, it's not just about you staying off alcohol and avoiding potentially harmful chemicals while pregnant or trying to become so. Your partners' exposure to plastics and packaging could play an important role in your ability to conceive a child.

A father's exposure to chemicals commonly found in plastics, personal care products and food packaging might decrease the quality of embryos produced by their sperm, according to a new study out of Massachusetts.

The study, published today in the journal *Human Reproduction*, is the first to examine dads' exposure to phthalates and embryo quality through five days of in vitro fertilization (IVF). The lower quality embryos had fewer signs of the type of progress that leads to a fetus. ...

While the study doesn't prove phthalates in men lead to poor quality embryos, it adds to mounting evidence that the ubiquitous chemicals may impact pregnancies.

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See original article in *Human Reproduction*, "[Parental contributions to early embryo development: influences of urinary phthalate and](#)

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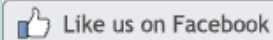
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[phthalate alternatives among couples undergoing IVF treatment](#)".



Also see in *Science of The Total Environment*, "[Low-level environmental arsenic exposure correlates with unexplained male infertility risk](#)".

Occupational Exposure to Endocrine-Disrupting Chemicals and Birth Weight and Length of Gestation: A European Meta-Analysis

Source: [Environmental Health Perspectives, November 2016](#)

Authors: Laura Birks, et al.

Background: Women of reproductive age can be exposed to endocrine-disrupting chemicals (EDCs) at work, and exposure to EDCs in pregnancy may affect fetal growth.

...

Results: Eleven percent of pregnant women were classified as exposed to EDCs at work during pregnancy, based on job title. Classification of exposure to one or more EDC group was associated with an increased risk of term LBW [Low Birth Weight] [odds ratio (OR) = 1.25; 95% CI: 1.04, 1.49], as were most specific EDC groups; this association was consistent across cohorts. Further, the risk increased with increasing number of EDC groups (OR = 2.11; 95% CI: 1.10, 4.06 for exposure to four or more EDC groups). There were few associations ($p < 0.05$) with the other outcomes; women holding job titles classified as exposed to bisphenol A or brominated flame retardants were at higher risk for longer length of gestation. ...

Conclusion: Results from our large population-based birth cohort design indicate that employment during pregnancy in occupations classified as possibly or probably exposed to EDCs was associated with an increased risk of term LBW.

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EPA Moves to Ban Certain Aerosol Degreasers and Dry Cleaning Spot Removers as the First Major Regulatory Action Under Chemical Reform Law

Source: [U.S. Environmental Protection Agency, December 7, 2016](#)

WASHINGTON -- The U.S. Environmental Protection Agency (EPA) is proposing to ban certain uses of the toxic chemical trichloroethylene (TCE) due to health risks when used as a degreaser and a spot removal agent in dry cleaning.

"For the first time in a generation, we are able to restrict chemicals already in commerce that pose risks to public health and the environment," said Jim Jones, assistant administrator for the Office of Chemical Safety and Pollution Prevention. "Once finalized, today's action will help protect consumers and workers from cancer and other serious health risks when they are exposed to aerosol degreasing, and when dry cleaners use spotting agents. I am confident that the new authority Congress has given us is exactly what we need to finally address these important issues."

EPA identified serious risks to workers and consumers associated with TCE uses in a 2014 assessment that concluded that the chemical can cause a range of adverse health effects, including cancer, developmental and neurotoxicological effects, and toxicity to the liver.

Specifically, EPA is proposing to prohibit manufacture (including import), processing, and distribution in commerce of TCE for use in aerosol degreasing and for use in spot

cleaning in dry cleaning facilities. EPA is also proposing to require manufacturers, processors, and distributors to notify retailers and others in their supply chains of the prohibitions.

[Read more...](#)

See article in *Chemical & Engineering News*, "[EPA moves to ban use of trichloroethylene](#)".

TURI's Note: TCE is designated as a Higher Hazard Substance under the MA Toxics Use Reduction Act. See our page on [Trichloroethylene](#) for information on health effects, alternatives, etc.

McGill researchers lead development of tool to assess environmental risks of chemicals

[Source: McGill University, December 8, 2016](#)

Assessing the risks that toxic chemicals pose to natural ecosystems is a huge challenge, given the thousands of chemicals that require testing. But the task is expected soon to become less daunting, thanks to a new tool being developed by McGill University researchers.

An interdisciplinary McGill team led by Prof. Nil Basu of the Department of Natural Resource Sciences in the Faculty of Agricultural and Environmental Sciences, in collaboration with colleagues at the University of Saskatchewan and Environment and Climate Change Canada as well as a series of industrial partners, is working on a genomics-based tool for assessing the effects of chemicals on a range of fish, birds and amphibians. A major strength of the team, which includes Prof. Jessica Head and Prof. Gordon Hickey (also from Natural Resource Sciences), Prof. Jianguo Xia (Animal Science/Institute of Parasitology), and Prof. Steve Maguire (Desautels Faculty of Management), is its diversity and breadth of expertise. ...

The project is being driven by the needs of national and international regulators. The new testing tool, known as EcoToxChip, should also prove valuable to companies in the resource extraction and chemical manufacturing industries in completing environmental assessments that are required by law or their own internal policies, the researchers say.

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Also see from the U.S. Environmental Protection Agency, "[Ecotoxicogenomics to Support Ecological Risk Assessment: A Case Study with Bisphenol A in Fish](#)".

EU to Evaluate Chemicals Used In Cosmetics for Potential New Regulations

[Source: JDSupra Business Advisor, December 7, 2016](#)

[Authors: Joseph Green and Laura van der Meer](#)

Several substances used as ingredients for cosmetic and other consumer products will be evaluated for possible regulatory action in the European Union in the next three years.

On 27 October 2016, the European Chemicals Agency (ECHA) announced its proposal under the EU's REACH Regulation to evaluate 117 chemical substances suspected of posing a risk to human health and the environment. Each substance listed on the final Action Plan for 2017-2019 will be evaluated by an assigned Member State which may recommend: a) harmonized classification and labelling for carcinogenic, mutagenic or

toxic to reproductions, respiratory sensitizers or other effects; b) identification of the substance as a substance of very high concern; c) restrictions on the use of the substance; or d) actions outside the scope of REACH, such as proposals for EU occupational exposure limits, national measures or voluntary industry actions. These recommendations are submitted to the Commission, potentially prompting regulatory initiatives.

Of the 117 substances proposed for review, 22 are chemicals that were not previously listed. One of these new substances, butan-1-ol (also known as 1-Butanol or n-Butanol), is used as an ingredient in perfumes and as a solvent for the extraction of essential oils. According to the draft Action Plan, butan-1-ol is suspected to have reprotoxic properties, and is of further concern due to its widely dispersed use, broad consumer uses, potential for worker exposure, and high tonnage. The substance is tentatively assigned to Hungary for review in 2017.

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See from the European Chemicals Agency (ECHA), "[Member States plan to evaluate 117 substances in 2017-2019](#)". Here is their 30 page, "[Draft Community Rolling Action Plan \(CoRAP\) update for years 2017-2019](#)".

Also see from ECHA, "[Citizens and experts to get more information on nanomaterials](#)".

Chemical Assessment in Canada

Source: [Paint & Coatings Industry](#), December 1, 2016

Author: Gary LeRoux

The biggest regulatory challenge for the paint and coatings industry in Canada over the past 10 years has been the federal government's Chemicals Management Plan (CMP). It reviewed 43,000 substances at the outset, with 2,300 of these in the first two phases of the CMP being considered priorities for assessment in a further breakdown for those substances "of concern". Phase 3 of the CMP (CMP-3), which has just begun, will assess 1,500 substances over the next five years, 30 percent of which are used in the paint and coatings industry.

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See the page on [Triclosan](#), including a link to the [Proposed Order](#) which is currently out for public comment.

Also see article from *Chemical Watch*, "[Canada launches third phase of Chemicals Management Plan](#)".

Notice of Intent to List Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS)

Source: [CA Office of Environmental Health Hazard Assessment](#), Updated December 7, 2016

The California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA) intends to list *perfluorooctanoic acid (PFOA)* and *perfluorooctane sulfonate (PFOS)* as known to the state to cause reproductive toxicity under the Safe Drinking Water and Toxic Enforcement Act of 1986. This action is being proposed under the authoritative bodies listing mechanism. ...

Formal identification and sufficiency of evidence for PFOA: In 2016, US EPA released the documents: *Drinking Water Health Advisory (HA) for Perfluorooctanoic Acid (PFOA)*(US

EPA, 2016a) and *Health Effects Support Document for Perfluorooctanoic Acid* (US EPA, 2016b). In the former document, US EPA developed a lifetime drinking water HA for PFOA (US EPA, 2016a) based on a reference dose (RfD) derived from a developmental toxicity study in mice in which developmental toxicity was manifested as reduced ossification in proximal phalanges and accelerated puberty in males (US EPA, 2016b). Both documents contain conclusions about the developmental toxicity of PFOA, referencing studies in which developmental toxicity results entirely or predominantly from prenatal exposure to the chemical. ...

Formal identification and sufficiency of evidence for PFOS: In 2016, US EPA released the documents: *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS)* (US EPA, 2016c) and *Health Effects Support Document for Perfluorooctane Sulfonate* (US EPA, 2016d). In the former document US EPA developed a lifetime drinking water HA for PFOS (US EPA, 2016c) based on a reference dose (RfD) derived from a developmental toxicity study in rats in which developmental toxicity was manifested as reduced body weight of pups on lactation day 1 (US EPA, 2016d). Both documents make conclusions about the developmental toxicity of PFOS, referencing studies in which prenatal exposure to the chemical results in developmental toxicity.

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TURI's Note: The MA TURA Science Advisory Board (SAB) is [requesting](#) and will be reviewing hazard information on long and short chain perfluoroalkyl substances, including perfluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA).

Comprehensive characterization of industrially discarded fruit fiber, *Tamarindus indica* L. as a potential eco-friendly bio-reinforcement for polymer composite

[Source: *Journal of Cleaner Production*, January 2017](#)

[Authors: J.S. Binoj, R. Edwin Raj, B.S.S. Daniel](#)

Utilizing industrially discarded bio-waste as a bio-reinforcement for polymer composite is one way to find alternate solution for harmful, conventional man-made vitreous fibers. In this work, one such agro waste, tamarind fruit fiber is tested comprehensively for its potentiality as a reinforcement in unsaturated polyester matrix to optimize the mechanical properties. 40 wt% fiber content provides optimum properties, while further addition of fiber reduces the strength due to ineffective bonding between the fiber and the matrix. This is revealed in the microscopic images of the fractured tensile specimens. The experimental results are verified and correlated with the Hirsch's and Series models and found that Hirsch's model agrees well with the experimental results. Thermal stability and aquatic properties are ascertained by the degradation temperature and the water absorption characteristics in fresh and sea water. The diffusion coefficient is found to follow pseudo-fickian behavior. Comprehensive analysis of this material confirms its applicability for light weight automotive and marine applications.

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Prioritizing Chemicals for Risk Assessment Using Chemoinformatics: Examples from the IARC Monographs on Pesticides

[Source: *Environmental Health Perspectives*, December 2016](#)

[Authors: Neela Guha, Kathryn Z. Guyton, Dana Loomis, and Dinesh Kumar Barupal](#)

Background: Identifying cancer hazards is the first step towards cancer prevention. The International Agency for Research on Cancer (IARC) Monographs Programme, which

has evaluated nearly 1,000 agents for their carcinogenic potential since 1971, typically selects agents for hazard identification on the basis of public nominations, expert advice, published data on carcinogenicity, and public health importance. ...

Discussion: To inform selection among a broad range of pesticides nominated for evaluation, we identified and screened nearly 6,000 relevant chemical structures, after which we systematically compiled information on 980 pesticides, creating network maps that allowed cluster visualization by chemical similarity, pesticide class, and publicly available information concerning cancer epidemiology, cancer bioassays, and carcinogenic mechanisms. ...

Conclusions: This systematic approach, accounting for chemical similarity and overlaying multiple data sources, can be used by risk assessors as well as by researchers to systematize, inform, and increase efficiency in selecting and prioritizing agents for hazard identification, risk assessment, regulation, or further investigation. This approach could be extended to an array of outcomes and agents, including occupational carcinogens, drugs, and foods.

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Nanomaterials vs. Ambient Ultrafine Particles: an Opportunity to Exchange Toxicology Knowledge

Source: Environmental Health Perspectives, November 4, 2016

Authors: Vicki Stone, et al.

Background: A rich literature exists that has demonstrated adverse human health effects following exposure to ambient air particulate matter (PM), with strong support for an important role for ultrafine (nano-sized) particles. At present, relatively little human health or epidemiology data exists for engineered nanomaterials (NM) despite clear parallels in their physicochemical properties and biological actions in *in vitro* models. ...

Discussion:

Key lessons range from the availability of specific techniques and standard protocols for physicochemical characterization and toxicology assessment, to understanding and defining dose and the molecular mechanisms of toxicity. This review identifies a number of key areas where additional research prioritisation would facilitate both research fields simultaneously.

Conclusion:

There is now an opportunity to apply knowledge from NM toxicology and use it to better inform PM health risk research and vice versa.

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