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CEC publishes two reports on use of flame retardants in consumer products in North America

[Source: Commission for Environmental Cooperation, December 23, 2015](#)

The Commission for Environmental Cooperation (CEC) has issued two reports to enhance the capacity of governments, trade associations, and the manufacturing sector to assess risks from the use of emerging flame retardants in consumer products.

In recent years, public concern has grown over the use of flame retardants in products. The international and North American communities have recognized that flame retardants -- chemical compounds that help prevent or delay combustion in items manufactured for indoor use -- can nonetheless have detrimental effects on the environment and human health.

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See reports here, [Enhancing Trilateral Understanding of Flame Retardants and Their Use in Manufactured Items, Summary Report Phase I](#) and [Summary Report Phase II](#).

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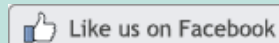
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Polybrominated Diphenyl Ether (PBDE)-Induced Suppression of Phosphoenolpyruvate Carboxykinase (PEPCK) Decreases Hepatic Glyceroneogenesis and Disrupts Hepatic Lipid Homeostasis

Source: [Journal of Toxicology and Environmental Health, Part A: Current Issues, December 21, 2015](#)

Authors: [Kylie R. Cowens](#), [Stephen Simpson](#), [W. Kelley Thomas](#), and [Gale B. Carey](#)

Polybrominated diphenyl ethers (PBDE) are a class of flame-retardant chemicals that leach into the environment and enter the human body. PBDE have been shown to suppress activity of phosphoenolpyruvate carboxykinase (PEPCK), a key enzyme in fatty acid esterification via hepatic glyceroneogenesis. The objective of this investigation was to assess hepatic glyceroneogenesis and lipid metabolism in PBDE-treated rats. Male, weanling Wistar rats were gavaged daily for 28 d with 14 mg/kg body weight of either DE-71, a commercial PBDE mixture (treated), or corn oil (control). After a 48-h fast, rats were euthanized, blood was obtained, and livers were excised. Suppression of hepatic PEPCK activity by 40% was noted. Serum ketone bodies were elevated by 27% in treated rats compared to controls, while hepatic glyceroneogenesis as measured by ¹⁴C-pyruvate incorporation into triglycerides was 41% lower in explants from treated rats compared to controls. Liver lipid content was 29% lower in treated animals compared to controls. Taken together, these findings suggest that DE-71-induced inhibition of hepatic PEPCK activity alters lipid metabolism by redirecting fatty acids away from esterification and storage toward ketone synthesis.

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See article in the *Portland Press Herald*, "[UNH study links flame retardant chemicals to obesity](#)".

Congress Poised To Finalize New Chemical Safety Law

Source: [Chemical & Engineering News, December 21, 2015](#)

Author: [Britt E. Erickson](#)

After the U.S. Senate last week passed S. 697 to modernize the federal law that controls commercial chemicals, Congress launched negotiations to resolve differences between that bill and a similar measure approved by the House of Representatives.

The House cleared its slimmer version of the legislation (H.R. 2576) to reform the Toxic Substances Control Act (TSCA) in June.

Lawmakers hope to have a bill ready for a vote by both chambers early in 2016. But getting S. 697 to the Senate floor on Dec. 17 was chock-full of obstacles, and a few bumps remain before it is ready for the president's signature. The legislation has widespread support from the chemical industry and some environmental and public health organizations, but other activist groups oppose it.

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Also see from *Portland Press Herald*, "[Congressional effort to strengthen toxics law could affect Maine](#)"; and from Environmental Working Group, "[Top Problems With The Two TSCA Bills](#)".

Predictions and Outlook for EPA's Office of Chemical Safety and Pollution Prevention (OCSP) 2016

Source: JDSupra Business Advisor, January 6, 2016

Authors: James Aidala, Timothy Backstrom, Lynn L. Bergeson, Lisa Campbell, Sheryl Lindros Dolan, Richard Engler, and Carla Hutton

...Aside from possible TSCA reform implementation, OPPT will have its hands full. During 2015, Office of Pollution Prevention and Toxics (OPPT):

- Proposed Significant New Use Rules (SNUR) on long-chain perfluoroalkyl carboxylate (PFAC) and perfluoroalkyl sulfonate (PFAS) chemicals and toluene diisocyanates (TDI);
- Proposed Section 8(a) reporting and recordkeeping requirements for existing chemical nanoscale materials;
- Promulgated a SNUR on hexabromocyclododecane (HBCD) used in textiles; and
- Amended the requirements for electronic submission of Section 5 notices, which take effect in January 2016 (see our memorandum "TSCA: New Requirements for Submitting Section 5 Notices Take Effect in January 2016" for more information).

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Study finds chemicals may be affecting Maine bass

Source: Portland Press Herald, December 26, 2015

Author: Kevin Miller

A federal study is raising concerns about the impacts of hormone-disrupting chemicals on fish at national wildlife refuges across the Northeast, including two Maine refuges where nearly every smallmouth bass showed potential effects of chemical exposure.

Sunkhaze Meadows National Wildlife Refuge near Orono and Moosehorn National Wildlife Refuge outside of Calais were among five locations where biologists found enough evidence of physiological changes in bass for them to urge more study. Between 90 percent and 100 percent of the male smallmouth bass tested at both refuges had developed female characteristics in their reproductive systems, likely the result of endocrine-disrupting chemicals in the environment.

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See original study in *Ecotoxicology and Environmental Safety*, "[Evidence of estrogenic endocrine disruption in smallmouth and largemouth bass inhabiting Northeast U.S. national wildlife refuge waters: A reconnaissance study](#)".

Food Wrapper Chemicals Banned

Source: Chemical & Engineering News, January 6, 2016

Author: Britt E. Erickson

Three perfluoroalkyl ethyl containing substances that repel grease and water can no longer be used to coat paper that comes into contact with food sold in the U.S., on Jan.

4. FDA's action comes in response to a 2014 petition by environmental and public health groups that claim the chemicals are linked to cancer and birth defects.

The substances have been used in microwave popcorn bags, pizza boxes, fast-food wrappers, and other paper food packaging. The chemicals have not been made in the U.S. since 2011. But food packaging that contains the compounds could be made in other countries and imported into the U.S., FDA says.

The basis for FDA's action is new toxicity data for substances which are structurally similar to these compounds. "There is no longer a reasonable certainty of no harm from the food-contact use of these food-contact substances," the agency says.

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Also see from *Environmental Science & Technology*, "[A Simple Pharmacokinetic Model of Prenatal and Postnatal Exposure to Perfluoroalkyl Substances \(PFASs\)](#)" and "[Ubiquitous Occurrence of Fluorotelomer Alcohols in Eco-Friendly Paper-Made Food-Contact Materials and Their Implication for Human Exposure](#)".

Ambiguity of non-systematic chemical identifiers within and between small-molecule databases

Source: Journal of Cheminformatics, November 16, 2015

Authors: Saber A. Akhondi, Sorel Muresan, Antony J. Williams, and Jan A. Kors

A wide range of chemical compound databases are currently available for pharmaceutical research. To retrieve compound information, including structures, researchers can query these chemical databases using non-systematic identifiers. These are source-dependent identifiers (e.g., brand names, generic names), which are usually assigned to the compound at the point of registration. The correctness of non-systematic identifiers (i.e., whether an identifier matches the associated structure) can only be assessed manually, which is cumbersome, but it is possible to automatically check their ambiguity (i.e., whether an identifier matches more than one structure). In this study we have quantified the ambiguity of non-systematic identifiers within and between eight widely used chemical databases. We also studied the effect of chemical structure standardization on reducing the ambiguity of non-systematic identifiers.

Results

The ambiguity of non-systematic identifiers within databases varied from 0.1 to 15.2% (median 2.5%). Standardization reduced the ambiguity only to a small extent for most databases. A wide range of ambiguity existed for non-systematic identifiers that are shared between databases (17.7-60.2%, median of 40.3%). Removing stereochemistry information provided the largest reduction in ambiguity across databases (median reduction 13.7 percentage points).

Conclusions

Ambiguity of non-systematic identifiers within chemical databases is generally low, but ambiguity of non-systematic identifiers that are shared between databases, is high. Chemical structure standardization reduces the ambiguity to a limited extent. Our findings can help to improve database integration, curation, and maintenance.

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Effect of Fully Biobased Coatings Constructed via Layer-by-Layer Assembly of Chitosan and Lignosulfonate on the Thermal, Flame Retardant, and Mechanical Properties of Flexible

Polyurethane Foam

[Source: ACS Sustainable Chemistry & Engineering, December 24, 2015](#)

Authors: Ying Pan, Jing Zhan, Haifeng Pan, Wei Wang, Gang Tang, Lei Song, and Yuan Hu

A fully biobased coating containing chitosan (CS) and lignosulfonate (LS) was facilely fabricated on the surface of flexible polyurethane foam (FPUF) using layer-by-layer assembly method. The CS/LS based coatings were successfully deposited on the substrate, as demonstrated by UV-vis absorption spectroscopy, attenuated total reflection Fourier transform infrared spectroscopy, and scanning electron microscopy. Subsequently, the different bilayers of the coatings were applied to enhance the thermal stability, fire resistance, and mechanical properties of FPUFs. It was found that the thermal degradation of coated FPUF under nitrogen atmosphere was obviously retarded compared with the pure FPUF. Furthermore, an eight-bilayer CS/LS based coating significantly improved the fire resistance of FPUF, as evidenced by the remarkable reduction (42%) of peak heat release rate. Meanwhile, the mechanical property of coated FPUF was improved. After the FPUF was covered with the eight-bilayer coating, the tensile strength was increased from 0.17 to 0.19 MPa compared with pure FPUF.

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A systematic evaluation of chemicals in hydraulic-fracturing fluids and wastewater for reproductive and developmental toxicity

[Source: Journal of Exposure Science & Environmental Epidemiology, January 6, 2016](#)

Authors: Elise G. Elliott, Adrienne S. Ettinger, Brian P. Leaderer, Michael B. Bracken, and Nicole C. Deziel

Hydraulic-fracturing fluids and wastewater from unconventional oil and natural gas development contain hundreds of substances with the potential to contaminate drinking water. Challenges to conducting well-designed human exposure and health studies include limited information about likely etiologic agents. We systematically evaluated 1,021 chemicals identified in hydraulic-fracturing fluids (n=925), wastewater (n=132), or both (n=36) for potential reproductive and developmental toxicity to triage those with potential for human health impact. We searched the REPROTOX database using Chemical Abstract Service registry numbers for chemicals with available data and evaluated the evidence for adverse reproductive and developmental effects. Next, we determined which chemicals linked to reproductive or developmental toxicity had water quality standards or guidelines. Toxicity information was lacking for 781 (76%) chemicals. Of the remaining 240 substances, evidence suggested reproductive toxicity for 103 (43%), developmental toxicity for 95 (40%), and both for 41 (17%). Of these 157 chemicals, 67 had or were proposed for a federal water quality standard or guideline. Our systematic screening approach identified a list of 67 hydraulic fracturing-related candidate analytes based on known or suspected toxicity. Incorporation of data on potency, physicochemical properties, and environmental concentrations could further prioritize these substances for future drinking water exposure assessments or reproductive and developmental health studies.

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See article in [YaleNews](#), "[Toxins found in fracking fluids and wastewater, study shows](#)" and [The Huffington Post](#), "[Fracking Fluid Contains A Stew of Known Toxic Chemicals -- And That May Not Be The Worst Of It](#)".

Five new substances of very high concern added to the

Candidate List

[Source: European Chemicals Agency, December 17, 2015](#)

ECHA has added five new SVHCs to the Candidate List due to the carcinogenic, toxic to reproduction, persistent, bioaccumulative and toxic (PBT), and very persistent and very bioaccumulative (vPvB) properties of the substances. The decision to include perfluorononan-1-oic acid and its sodium and ammonium salts was taken with the involvement of the Member State Committee.

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Federal Agencies Partner to Launch the Transform Tox Testing Challenge to Improve Chemical Screening

[Source: U. S. Environmental Protection Agency, January 8, 2016](#)

WASHINGTON -- [Today], the U.S. Environmental Protection Agency (EPA) and the National Institutes of Health's (NIH) National Center for Advancing Translational Sciences (NCATS), and NIH's National Toxicology Program (NTP) within the National Institute of Environmental Health Sciences (NIEHS) are announcing a new challenge that will award up to \$1 million to improve the relevance and predictivity of data generated from automated chemical screening technology used for toxicity testing.

Out of thousands of chemicals in commerce today, very few have been fully evaluated for potential health effects. Scientists from EPA, NIEHS/NTP, and NCATS are using high-throughput screening (HTS) assays to evaluate the potential health effects of thousands of chemicals. High-throughput screening uses automated methods that allow for a large number of chemicals to be rapidly evaluated for a specific type of biological activity.

Current HTS assays do not fully incorporate chemical metabolism, so they may miss chemicals that are metabolized to a more toxic form in the body. The challenge announced today, Transform Tox Testing Challenge: Innovating for Metabolism, is calling on innovative thinkers to find new ways to incorporate physiological levels of chemical metabolism into HTS assays. This will help researchers more accurately assess effects of chemicals and better protect human health.

[Read more...](#)

Also see from U.S. EPA, "[Nominations Open for EPA's Annual Environmental Merit Awards in New England -- Due by Feb. 12](#)".

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