

Extramural papers of the month

By Nancy Lamontagne

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Superfund Research Program
Research Brief. New issues
are published on the first
Wednesday of each month.

Health risk assessment examines shrimp consumption after Deepwater Horizon oil spill

A risk assessment carried out by NIEHS grantees showed that people who frequently consume shrimp from an area affected by the Deep Water Horizon oil spill had no serious health risks or increased cancer risk from eating this seafood. Although it was thought that seafood from the area of the oil spill would contain high levels of polycyclic aromatic hydrocarbons (PAHs), a toxicant found in crude oil, the shrimp actually showed very low levels of PAHs.

After the Deep Water Horizon oil spill of 2010, there was concern about health risks associated with eating seafood contaminated from the spill. To assess these risks, the researchers used a community-based approach to survey and assess shrimp consumption, food preparation methods, and personal bodyweight in a group of Vietnamese-Americans in Southeast Louisiana. Many Vietnamese-Americans in the Gulf-coast region are involved in commercial shrimping and fishing and frequently consume white shrimp. The investigators analyzed levels of 81 PAHs in locally harvested white shrimp and combined this information with survey data they collected from the Vietnamese-Americans. The results showed no excess cancer or non-cancer health risks.

Citation: [Wilson MJ, Frickel S, Nguyen D, Bui T, Echsner S, Simon BR, Howard JL, Miller K, Wickliffe JK.](#)
(<http://www.ncbi.nlm.nih.gov/pubmed/25333566>)

2014. A targeted health risk assessment following the Deep Water Horizon Oil Spill: polycyclic aromatic hydrocarbon exposure in Vietnamese-American shrimp consumers. *Environ Health Perspect*; <http://dx.doi.org/10.1289/ehp.1408684> [Online 21 October 2014].

Meta-analysis tracks progress of contaminants of emerging concern

An NIEHS-funded meta-analysis of 143,000 peer-reviewed research papers revealed that the time between when the initial safety concern about a contaminant emerges and when that concern warrants appropriate action is about 14 years. The study's author says that decreasing both the number of contaminants of emerging concern that enter commerce and the time required to take action is necessary to better protect human health and the environment.

The author examined 30 years of publishing activity for the following 12 contaminants of emerging concern: dichlorodiphenyltrichloroethane (DDT), trichloroacetic acid (TCAA), N-nitrosodimethylamine, methyl tert-butyl ether, trichloroethylene, perchlorate, 1,4-dioxane, prions, triclocarban, triclosan, nanomaterials, and microplastics. Harmful environmental agents showed a common pattern of rising to a level of peak concern over 14 years and then declining to a baseline level. The author reports that contaminants of concern emerge, and some re-emerge, because of improved scientific analysis capabilities; scientific paradigm shifts such as the discovery of infectious proteins; and the development, marketing, and mass consumption of new products such as antimicrobial personal care products, microplastics, and nanomaterials.

Citation: [Halden RU.](#)

(<http://www.ncbi.nlm.nih.gov/pubmed/25294779>)

2014. Epistemology of contaminants of emerging concern and literature meta-analysis. *J Hazard Mater*; doi: 10.1016/j.jhazmat.2014.08.074. [Online 28 September 2014].

Endocrine-disrupting chemicals interfere with placental thyroid hormone activity

An NIEHS grantee and colleagues report strong evidence that endocrine-disrupting chemicals can interfere with thyroid hormone action in pregnant women without changing their blood levels of thyroid hormone. The findings show that truly understanding how endocrine-disrupting chemicals may affect pregnancies will require studying not only hormone levels detected in the blood but also hormone activity at the cellular level.

The researchers chose to analyze placental tissue because it is an important regulator of maternal thyroid hormone for the developing fetus. Using placental tissue samples from 164 pregnant women with no thyroid disease, they analyzed the messenger RNA (mRNA) expression for the enzyme CYP1A1. Prior studies showed that CYP1A1 can change certain endocrine-disrupting chemicals, such as PCBs, into a form that can directly activate the body's thyroid hormone receptors.

The researchers found that levels of CYP1A1 mRNA varied 5-fold across the 132 placental samples in which it was detected. Although the mothers' thyroid hormone blood levels remained the same, pregnancies where the placenta contained higher levels of CYP1A1 mRNA expression tended to exhibit signs of thyroid disruption in the placenta. CYP1A1 mRNA expression also strongly correlated with expression levels of two thyroid-regulated genes. Expression levels of each gene correlated with each other, which suggests that they share a common activator.

The findings are consistent with the hypothesis that CYP1A1 allows some endocrine disrupting chemicals such as PCBs to activate the thyroid hormone receptor. The current study is the first to show this correlation in humans and suggests that CYP1A1 may be an important tissue biomarker of susceptibility to thyroid signaling disruption.

Citation: [Wadzinski TL, Geromini K, McKinley Brewer J, Bansal R, Abdelouahab N, Langlois MF, Takser L, Zoeller RT.](#)
(<http://www.ncbi.nlm.nih.gov/pubmed/25299844>)

2014. Endocrine disruption in human placenta: expression of the dioxin-inducible enzyme, Cyp1a1, is correlated with that of thyroid hormone-regulated genes. *J Clin Endocrinol Metab*; <http://dx.doi.org/10.1210/jc.2014-2629> [Online 9 October 2014].

Maternal gestational diabetes linked to daughters being overweight later

NIEHS grantees report that women who developed gestational diabetes and were overweight before pregnancy were at a higher risk of having daughters who were obese later in childhood. The findings suggest that helping women reduce weight gain and improve lifestyle before and during pregnancy may also help reduce the risk of obesity in their children.

The researchers studied associations between childhood obesity and gestational diabetes in 421 girls and their mothers who were part of the Cohort study of Young Girls' Nutrition, Environment, and Transitions (CYGNET). Each year from 2005 to 2011, the researchers recorded the girls' height, weight, body fat, abdominal obesity, and other parameters. Kaiser Permanente's comprehensive electronic medical records allowed researchers to link data collected on the girls to information about their mothers.

Twenty-seven mothers in the study had gestational diabetes. If a girl's mother had gestational diabetes, her risk of having a body mass index at or above the 85th percentile was 3.5 times higher than girls whose mothers did not have gestational diabetes. This association was independent of other factors that influence obesity such as race/ethnicity, maternal obesity, and a girl's pubertal stage. If the girl's mother was overweight in addition to having gestational diabetes, the daughter's risk of being overweight was about 5.5 times higher.

Citation: [Kubo A, Ferrara A, Windham GC, Greenspan LC, Deardorff J, Hiatt RA, Quesenberry CP Jr, Laurent C, Mirabedi AS, Kushi LH.](#)

(<http://www.ncbi.nlm.nih.gov/pubmed/25150158>)

2014. Maternal hyperglycemia during pregnancy predicts adiposity of the offspring. *Diabetes Care* 37(11):2996-3002.

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