

Humans may be harmed by endocrine disrupting chemicals released during natural gas mining

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More than 15 million Americans live within one mile of unconventional oil and gas (UOG) operations that combine directional drilling and hydraulic fracturing, or "fracking" to release natural gas from underground rock. Scientific studies still are inconclusive on the potential long-term effects on human development. Now, Susan C. Nagel and Christopher D. Kassotis, researchers with the University of Missouri, and national colleagues have conducted a review of research on health effects associated with UOG operations and concluded these activities have potential for environmental release of a complex mixture of endocrine disrupting chemicals (EDCs) that could potentially harm human development and reproduction.

The authors reviewed more than 100 scientific, peer-reviewed publications and examined the studies thoroughly for patterns and links that focused on UOG chemicals and [human development](#). In their peer-reviewed commentary, the authors concluded that available research suggests potential adverse health outcomes and note a dearth of evidence-based research related to the UOG process.

"We recommend a process to examine the total endocrine disrupting activity from exposure to the mixtures of chemicals used in and resulting from these operations in addition to examining the effects of each chemical on its own," Nagel said. "Studying these complex mixtures of chemicals released during fracking is necessary since the chemical

identities used in oil and [natural gas](#) operations are not always known. Additionally, there is strong evidence of endocrine disrupting chemical mixtures having additive effects, so this approach also may be more sensitive."

Nagel, an associate professor of obstetrics, gynecology and women's health in the School of Medicine, and an adjunct associate professor of [biological sciences](#) in the College of Arts and Science at MU, conducted the review with fellow MU researchers Chris Kassotis, a recent doctoral graduate in the Division of Biological Sciences in the College of Arts and Science, and Jane McElroy, an associate professor in family and community medicine in the School of Medicine. Don Tillitt, an adjunct professor of biological sciences and a research toxicologist with the U.S. Geological Survey, also contributed to the study.

The review, "Endocrine Disrupting Chemicals and Oil and Natural Gas Operations: Potential Environmental Contamination and Recommendations to Assess Complex Environmental Mixtures" recently was published in *Environmental Health Perspectives*.

More information: *Environmental Health Perspectives*,
ehp.niehs.nih.gov/1409535/

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