CONCERNED ABOUT THE HEALTH RISK OF SODA?
TOXICOLOGISTS SHED LIGHT ON THE SCIENCE BEHIND RECENT REPORT

Reston, Va.; January 29, 2014 — Last week, Consumer Reports released a study on the levels of a caramel coloring agent known as 4-methylimidazole (4-MEI) in many popular, carbonated beverages. The report used phrases such as “health risk” and “potential carcinogen,” leaving many wondering whether their favorite sodas should be discarded because of a cancer risk. This is a question that toxicologists can help answer.

“Our work as toxicologists is to help conduct and interpret the findings of a variety of studies that evaluate the potential hazard of natural products, environmental chemicals and drugs to provide people with the information necessary to make informed, personal decisions,” says Lois D. Lehman-McKeeman, PhD, ATS, 2013-2014 President of the Society of Toxicology.

There have been many toxicological studies of 4-MEI over the years, but focusing on the study conducted by the National Toxicology Program cited in the Consumer Reports article, there are some significant details of how the study was conducted that are important toxicologically and for understanding the results.

- 4-MEI was administered to both mice and rats over their two-year lives through their food, so the exposure to the chemical was oral or the same as exposure would be in humans by drinking carbonated beverages.
- Different levels, or doses, of 4-MEI were tested. A basic tenant of toxicology is that the dose makes the poison. The level at which exposure occurs is crucial to understanding if a chemical poses a risk to health. Likewise, the greater the dose, the greater or more likely the adverse effect.

The rats in the study exposed to only the highest doses of 4-MEI (not the minimal or moderate doses) experienced a higher incidence of leukemia than the control group. The mice, though, showed no such result. In contrast, in mice exposed to the highest doses of 4-MEI, increased rates of lung tumors were observed. Again, the rats showed no such result. The conclusion is that 4-MEI in high doses is potentially carcinogenic for mice and rats, but in different ways. This study is a clear reminder that all animal species, including humans, respond diversely to specific chemicals, especially at doses that are so high that they may change normal physiological processes.

“Data showing effects in animal models are useful because these findings may indicate that further studies are necessary to confirm that the agent may affect humans, but caution is always encouraged when trying to extrapolate results across species,” says Dr. Lehman-McKeeman.
“The Society of Toxicology hopes that by illuminating the scientific details of studies into MEI-4, people feel better informed and more confident to make decisions regarding their consumption of soft drinks.

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**About SOT**

Founded in 1961, the Society of Toxicology (SOT) is a professional and scholarly organization of more than 7,700 scientists from academic institutions, government, and industry representing the great variety of individuals who practice toxicology in the US and abroad. SOT is committed to creating a safer and healthier world by advancing the science of toxicology. The Society promotes the acquisition and utilization of knowledge in toxicology, aids in the protection of public health, and has a strong commitment to education in toxicology and to the recruitment of students and new members into the profession. For more information about SOT and toxicology, visit the Society online at [www.toxicology.org](http://www.toxicology.org), follow it on Twitter [@SOToxicology](https://twitter.com/SOToxicology) or like it on [Facebook](https://www.facebook.com/SocietyofToxicology).

*Media Contact:*
Michelle Werts
Society of Toxicology
703.438.3115 ext. 1640
[ michelle@toxicology.org](mailto:michelle@toxicology.org)