

Autistic features linked to prenatal exposure to fire retardants, phthalates

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Exposure during pregnancy to a combination of fire retardant chemicals and phthalate chemicals—both present in the average home—can contribute to autistic-like behaviors in the offspring, according to an animal study to be presented Thursday at the Endocrine Society's 97th annual meeting in San Diego.

"Our research points to potentially preventable causes of autism, which remains a diagnosis with enormous social costs and limited solutions," said lead study author Stephanie Degroote, MSc, a PhD student at the University of Sherbrooke in Sherbrooke, Quebec, Canada.

Phthalates and brominated fire retardants are known endocrine disruptors, substances that can impair processes controlled by hormones. Past studies have suggested that exposure in the womb to either phthalates or [flame retardants](#) can affect mental and motor development and can provoke attention deficit. However, pregnant women are likely to come into contact with both chemicals simultaneously. They are common additives in many household plastic products, and flame retardants are on most furniture foam cushions.

The researchers wanted to know what the combined effect of these endocrine disruptors would be on the developing brain in mammals. Their study was performed in young rats, called rat pups, divided into three groups: (1) 28 pups whose [pregnant mothers](#) received low doses (by tube feeding) of a mixture of various phthalates and [brominated flame retardants](#), (2) 20 unexposed pups and (3) 18 pups given valproic

acid, a drug that induces autism in humans and autistic-like behavior in rats.

Degroote and co-workers found that the rat pups whose pregnant mothers received the chemical mixture showed behaviors similar to those seen in humans with [autism spectrum disorders](#). These animals, according to Degroote, had reduced social interactions and increased, hyperactive movements compared with unexposed pups. In general, males were more affected than females were and demonstrated less maternal bonding than their female counterparts did.

The third group, which served as a rat model of autism, had similar abnormal behaviors, including general developmental delay, the investigators reported.

The work received funding from the Foundation of Stars in Montreal and from the University of Sherbrooke's Center of Excellence in Mother-Child Research (Centre d'excellence de l'Université de Sherbrooke en recherche mère-enfant).

Many environmental factors and genes likely cause autism spectrum disorders, according to the National Institute of Mental Health. These disorders affect boys more often than girls.

"Our research finds that the developing brain is extremely sensitive to chemical additives found in our daily environment, and these chemical can contribute to the development of [autism](#)," Degroote said. "The good news is that these exposures are avoidable, contrary to [genetic risk factors](#), which are almost always not modifiable."

Provided by The Endocrine Society

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