LAY ABSTRACT

TITLE: Alteration of Mammary Gland Development and Gene Expression by *In Utero* Exposure to Cadmium

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Environmental exposure to the hormone estrogen and metals (that act like estrogen) early in life may change the development of the mammary gland (part of the breast that makes milk) and may result in earlier puberty. Changes in development of the mammary gland and earlier puberty may increase the risk of developing breast cancer.

Humans are exposed to the metal cadmium through diet, cigarettes, and drinking water. Cadmium can be transferred from mother to fetus in the womb before birth (*in utero*). We wanted to know how cadmium exposure in the womb affects mammary gland development and timing of puberty.

In our study, we exposed pregnant rats to cadmium and compared their female offspring to those not exposed to cadmium. In the offspring exposed to cadmium, puberty occurred earlier and their mammary glands formed earlier and grew more due in part to a change in the stem and progenitor cells which are thought to be the cell targets that drive the disease. Our results suggest that exposure to cadmium in the womb may contribute to the risk of getting breast cancer and demands further study in humans.