

How maternal smoking or nicotine use increases the risk of cardiovascular disease in later life

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Scientists now understand more about why being exposed to nicotine while you were a fetus will increase your risk of developing cardiovascular disease as an adult. "We have found distinct links between cigarette smoking or even using nicotine patches or gum and the long-term harm for the child," says Dr. DaLiao Xiao, a scientist who works at the Loma Linda University School of Medicine in California.

Publishing his research in the [British Journal of Pharmacology](#), Xiao showed that when he gave nicotine to pregnant rats, the offspring had higher risks of high blood pressure than animals whose mothers didn't receive nicotine during pregnancy. While the work was carried out in rats, these findings fitted well with studies carried out in people.

Importantly, Xiao and his colleagues have discovered that specific changes in the [blood vessel walls](#) account for this outcome. Xiao shows that nicotine causes the formation of chemicals, known as reactive oxygen species (ROS), in the walls of blood vessels in the fetus. These ROS cause permanent changes that alter the normal behaviour of the blood vessel. This faulty programming is then carried throughout the individual's life and may lead to high blood pressure in adults.

"Other researchers have shown that cigarette smoking or nicotine use in pregnant women results in an increased risk of hypertension and cardiovascular disease in adulthood. Our findings provide novel

information of the fetal programming that links fetal [nicotine exposure](#) to the long term damage," says Xiao.

In a commentary accompanying the paper, Associate Professor Christopher Sobey, of the Department of Pharmacology, Monash University, Australia, states, "If this is ultimately proven in humans, this important work will have revealed a novel [cardiovascular risk factor](#) that can only be modified before birth."

Provided by Wiley

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