

# Cigarette smoke exposure increases scar tissue in the kidney and heart, study finds

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Smoking may lead to fibrosis in the heart and kidneys and can worsen existing kidney disease, according to a new study. Fibrosis is tissue scarring that can impair the normal function of vital organs. The research team suggests that exposure to cigarette smoke negatively affects genetic messaging that controls tissue scarring. The study, published in *Physiological Genomics*, was chosen as an APSselect article for December.

Two groups of rats, one with [chronic kidney disease](#) (CKD) and one with normal renal function, were exposed to [cigarette smoke](#) five days a week for four weeks. The smoke groups were compared with two control groups—one with CKD and the other with normal kidney function—that were kept in a room with no smoke.

Several factors associated with heart disease increased in the smoke groups, including blood pressure, enlargement of the heart and development of [scar tissue](#) in the heart muscle. Animals exposed to smoke also had fibrosis and reduced function in the kidneys.

Researchers examined genetic material (microRNA) in the organ tissue. They found that expression of the anti-fibrotic microRNA was significantly decreased in the smoke groups as compared to the control groups. Anti-fibrosis microRNA are small RNA molecules that are associated with slowing or preventing fibrosis.

The rat model of fibrosis paves the way for a similar exploration of

genetic expression in humans. "This is a significant and novel finding illustrating the effects of tobacco and nicotine on epigenetic regulation of [fibrosis](#) formation in cardiac and renal tissues," the authors wrote.

**More information:** Christopher A Drummond et al. Cigarette Smoking Causes Epigenetic Changes Associated With Cardiorenal Fibrosis, *Physiological Genomics* (2016). [DOI: 10.1152/physiolgenomics.00070.2016](#)

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