

Studies find that toxicity caused by second-hand smoke remains long after a smoker leaves the premises

March 7 2013, by Frances Fernandes

(Medical Xpress)—Researchers are finding that, long after a smoker leaves the premises, the toxicity caused by second-hand smoke remains and transforms into something even more deadly.

Relatively new research into Third-Hand Smoke (THS) – the remnants of [cigarette smoke](#) after it has dissipated into the air – is suggesting myriad harmful effects from exposure to the dust and to surfaces that have absorbed the [microscopic particles](#) of smoke.

Several of these new studies were discussed at the UC [Global Health Day](#), Feb. 23, during a session organized by UCR Professor Manuela Martins-Green of the Department of Cell Biology and Neuroscience. She and fellow UC researchers presented their work on the long-lasting presence of THS toxicants in the environment and on their effects in various [physiological processes](#) including healing of wounds, function of the liver and lung, and the effects on behavior.

Studies with mice – under conditions that mimic exposure to humans – show that wounds do take longer to heal, and could result in wounds that become chronic. In the liver, THS causes dysfunction potentially leading to cardiovascular disease and diabetes. In the lung, the effects are related to fibrosis, which could have consequences for [pulmonary disease](#) and asthma. In behavior, UCR investigators are finding that THS exposure leads to [hyperactivity](#), an effect that has been shown in children living in

the homes of smokers.

None of these issues has yet been explored or tested in humans. However, if the long-term damage that these studies would seem to portend is substantiated, it would have significant [economic implications](#) for hotel rooms, cars and homes. Already, researchers note, second-hand cars that were driven by smokers lose value at a steeper rate.

UCR researchers have been studying THS for the last couple of years with the support of several grants from UC Tobacco-Related Disease Research Program, which administers UC's portion of [tobacco tax](#) revenue and other anti-smoking funders.

UCR recently received more than \$800,000 to pursue cigarette-related toxicity research.

Five UCR labs are working in tobacco-related research, putting this campus among the lead institutions for research in this area.

Although the picture is still incomplete, researchers already know that, when smoke compounds such as nitrosamines and benzene-derivatives – already known carcinogens – and nicotine react with ozone, for example, a new toxicant results with increased risk. This and other chemical transformations take place as smoke remnants age. Researchers fear this residue could be particularly harmful to toddlers and the elderly as well as anyone who comes in close contact with contaminated surfaces.

"This area of research is new," says Professor of [Cell Biology](#) Prudence Talbot. "It will take a number of years to understand the impact of THS on human health. However, at this point it is advisable to inform individuals about possible dangers of THS exposure."

Talbot's research uses mouse embryonic stem cells to evaluate the

toxicity of smoke from traditional and harm-reduction cigarettes. She is also using the hamster oviduct to evaluate harm to the female reproductive tract.

Provided by University of California - Riverside

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