

E-cigarette vapor could lead to emphysema, study finds

May 7 2015, by Heather Smith



Like tobacco, e-cigarettes affect a smoker's lungs and long-term exposure could lead to chronic obstructive pulmonary disease – more commonly known as COPD or emphysema – according to the latest

research by Central Michigan University College of Medicine's Neeraj Vij, an associate professor of molecular and cell biology.

Vij, working with research fellow Prashanth Shivalingappa and CMU seniors Colin Westphal of Linden and Rachel Hole of Oakland, examined how e-cigarette vapor compared to tobacco smoke by testing how the vapor affects cells. The team found even minimal exposure of e-cigarette vapor for one hour, disrupted the protein processes in cells. It is the same path [cigarette smoke](#) and second-hand smoke takes in our bodies.

The team's e-cigarette findings were published as an abstract in the April edition of the *Journal of the Federation of American Societies for Experimental Biology*.

"COPD/[emphysema](#) is not a genetic disorder," Vij said. "We have described the role of overall protein processing in this and in previous research, which has been confirmed by studies from other groups.

"What we are talking about is how these proteins are made and how they are degraded. This process of proteostasis in our cells has to be very – in layman's terms – tightly regulated, because if it goes off-balance, it's a big problem."

Vij, Shivalingappa, Hole and Westphal exposed human bronchial [epithelial cells](#) to e-cigarette vapor from one to six hours and saw "significant disruptions" of the protein processing in the cells. Further tests verified that even minimal exposure of one-hour created harmful changes. The team also confirmed its findings with tests on laboratory mice exposed to acute e-cigarette vapors.

Vij joined the College of Medicine faculty last year from Johns Hopkins University, where he was an assistant professor and his research into

inflammation and specific proteins led to a better understanding of possible treatments for cystic fibrosis and COPD. He brought his ongoing research program on molecular pathways that lead to chronic diseases to CMU. His work was initiated by funding from National Institute of Health, Cystic Fibrosis Foundation and the Flight Attendant Medical Research Institute.

Vij's recent research into first- and second-hand smoke exposure related to COPD was published in The American Journal of Respiratory Cell Molecular Biology, Apoptosis and PlosOne and abstracts related to smoke-induced emphysema were published earlier this year by the National Center for Biotechnology Information. He also presented April 1 at the Experimental Biology Conference in Boston.

Provided by Central Michigan University

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