

Headlines saying 'vaping might cause cancer' are wildly misleading

January 31 2018, by Michael Walsh



Credit: Cancer Research UK

E-cigarettes are in the news again. This time with [headlines that they may cause cancer](#).

But the study that the stories are based on, published in the journal *PNAS*, doesn't show this.

What did the study do?

Researchers from New York University School of Medicine looked at how e-cigarette [vapour](#) affected the DNA of mice, and human cells in a dish.

They didn't look at how it affected people. And they didn't directly compare it to smoking.

The researchers focused on how components of e-cig vapour [damage](#) cells' DNA. And DNA damage increases the risk of cancer.

But they didn't look directly at whether e-cigs caused cancer, either in mice or in people.

What did the study show?

They found that e-cig vapour raised levels of DNA damage in the lungs, bladders and hearts of mice.

They also found that the molecular machinery cells use to repair this DNA damage was less effective in the lungs of mice exposed to e-cig vapour.

Then they looked at how nicotine, the chemical that e-cigs vaporise, affects human lung and bladder cells grown in a lab dish. Nicotine is what makes cigarettes addictive, but isn't what causes the damage from smoking. Both e-cigarettes and conventional cigarettes contain nicotine, but e-cigs have [much lower levels of the harmful components of tobacco smoke](#).

The researchers found that nicotine damages the DNA inside those lab-

grown [human lung](#) and bladder cells. And they found that these cells were less able to repair this damage. These cells were then more susceptible to further genetic faults that could give them properties like those of cancer cells.

What do the results mean?

The researchers described their results with an interesting line:

"It is therefore possible that e-cigarette smoke may contribute to lung and bladder cancer, as well as heart disease, in humans."

While this is technically possible, the study didn't look at humans, and so didn't show any effect on the health of humans.

Different e-cigs devices deliver different amounts of vapour, and people use them in different ways. So the levels of e-cig vapour and nicotine used in the study might not match the levels that people are exposed to through normal use.

And [other research](#) didn't show a link between nicotine products and cancer.

Finally and crucially, the study didn't compare vaping to [tobacco smoke](#).

What now?

[The evidence so far](#) shows that e-cigarettes are far less harmful than smoking.

And for some people they're a helpful aide to stop smoking.

Up to two-thirds of long term smokers will die because of their addiction. E-cigarettes don't contain tobacco, which is the biggest cause

of preventable death worldwide.

E-cigs are a relatively new technology and so we can't be certain about any long-term effects the devices might cause to health – they haven't been around long enough for this to be completely worked out. But compared to smoking, the evidence so far shows they are less harmful.

Studies like this are important for building up the evidence around vaping, and how e-cig vapour might damage cells in controlled conditions. It's a small piece in the puzzle, and must be viewed alongside other studies. Large, long-term studies are also needed to definitively answer health questions, because those conclusions can't be made from lab-grown [cells](#) and mice alone.

The popularity of e-cigs continues to grow, but figures show that most people using these devices are now ex-smokers, and people mainly use them to quit smoking or cut down.

So conclusions around the health effects of vaping must be viewed alongside the damage that [smoking](#) has wreaked for decades. Only then can smokers make a call that could have a big impact on their health.

More information: Hyun-Wook Lee et al. E-cigarette smoke damages DNA and reduces repair activity in mouse lung, heart, and bladder as well as in human lung and bladder cells, *Proceedings of the National Academy of Sciences* (2018). [DOI: 10.1073/pnas.1718185115](https://doi.org/10.1073/pnas.1718185115)

Provided by Cancer Research UK

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