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From: Cindy Lewis <drlewis@lewisassoc.com>
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To: boardclerk@slocleanair.org
Subject: [EXT]Air Pollution Control District Hearing Board public review submitted statement
Attachments: A scary new link between air pollution and lung cancer.docx

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It is clear from current science that particulates in the air exacerbate or trigger lung cancer (see below article).

Particulate matter from the dunes remains a critical public health issue, therefore, any change that reduces the compliance target from a 50 percent reduction to a 40.7 percent reduction should be rejected out of hand. The proposed work plan includes 59 acres of dust mitigation in the WSP/CLT (plover) nesting enclosure. This, too, must be rejected. State Parks has already taken credit for the nesting area closure. Furthermore, it is all but certain that the proposal will not be approved since the area is an Environmentally Sensitive Habitat Area. Any proposed extension of the Stipulated Order of Abatement term is unacceptable since it would delay compliance with state air quality standards. Again, this is a health issue! We still expect compliance with state air quality standards by the end of 2023.

IF you care more about the public health of all of us (babies, elderly, disabled, working families) than the financial stake a few have in dunes recreation, you will actively work to improve our public health by reducing particulates in our air.

Please vote accordingly.

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A scary new link between air pollution and lung cancer

BY LISA JARVIS

BLOOMBERG OPINION

A new study has upended the way researchers think about how air pollution causes lung cancer. The work cracks open a whole new way of thinking about certain cancers and how to treat and even prevent them. It also suggests environmental agencies may have good reason to impose much stricter limits on air quality.

Scientists typically describe carcinogens in terms of the havoc they wreak on our genome. UV exposure from sunbathing damages DNA in skin cells, and over time cells with mutations can accumulate and eventually grow with abandon. Smokers breathe in chemicals that can cause widespread mutations and alterations to DNA that can lead to lung cancer. Public health groups make sure that people know that damage is preventable – slather on the sunscreen or toss the pack of cigarettes – and drug companies have come up with medicines that target those mutations if they ignore that advice.

But researchers at the Francis Crick Institute found something different going on in lung cancer caused by pollution. Fine particles in dirty air, known as PM2.5, aren't directly tinkering with our DNA. Instead, they are setting off a chain reaction that causes tumors to grow.

It turns out that as we age, our cells accumulate mutations. Swanton's team studied biopsies taken from healthy lungs and found that more than half of those tissue samples had some cells that harbored two specific cancer-driving mutations.

But those cells aren't causing cancer. For that, they need a trigger.

When fine particulate matter in pollution is inhaled, a chemical called interleukin-1b sweeps in to do damage control. That inflammatory response can also push the small number of cells harboring mutations to proliferate. Eventually, a tumor forms.

The finding contributes to a growing body of evidence that scientists' assumptions about how environmental factors lead to cancer might be wrong. For example, researchers at the Wellcome Sanger Institute did a deep dive into the genomes of more than 500 people with esophageal cancer in hopes of finding an explanation for why some countries have higher rates of the disease than others. They expected to find mutations that could be traced back to some environmental or lifestyle driver of the disease. Instead, they were disappointed to find none.

At the time, the lead investigator, Michael Stratton, told the Guardian that the message is that these environmental factors weren't causing DNA damage. As

such, “we will have to rethink our ideas about the way in which some cancers develop,” he said.

In the last decade, poor air quality has been connected to increases in not only lung cancer, but many other kinds of cancer, including esophageal, stomach, pancreatic and breast disease. Could these other tumors be triggered in the same way as fine particles spark lung cancer?

The obvious solution is prevention, which means putting more focus on improving air quality. Last year, the World Health Organization recommended lowering the limit of PM2.5 concentrations to 5 micrograms per cubic meter, halving the previous annual limit. Currently, no countries are achieving that limit. In the U.S., for example, air quality regulations limit that exposure to 12 micrograms, though the Environmental Protection Agency recently recommended lowering that to 8 to 10 micrograms.

But prevention also means finding ways to address the many people around the world already at risk of these cancers because of chronic exposure to pollution. Climate change will make air quality harder to control in certain regions, with increasingly intense wildfire seasons raising the stakes for human health.

Swanton showed that giving mice a drug that blocks interleukin-1b prevented lung cancer caused by heavy exposure to fine particulate matter. Now the question is

whether such treatments reverse the course of people with precancerous lesions in their lungs.

At least one pharma company already has tried – and failed – at this approach in people with active cases of lung cancer. But maybe the intervention needs to happen much earlier on to make a difference, or perhaps other medicines would work better in patients where cancer has already developed.

One thing is clear, though: The high cost of air pollution just got even higher.