

The good side of carbon monoxide

November 20 2019

Most people think of carbon monoxide as harmful, and with good reason—the colorless, odorless gas sends 50,000 people in the U.S. to hospitals each year when their furnaces malfunction or car engines run in poorly ventilated spaces. But at low concentrations, carbon monoxide has a beneficial side that scientists are trying to harness to treat diseases, according to an article in *Chemical & Engineering News* (C&EN), the weekly newsmagazine of the American Chemical Society.

Carbon monoxide exerts its [harmful effects](#) by taking oxygen's place in binding to hemoglobin in the blood, thereby starving tissues of oxygen. However, the body naturally makes small amounts of [carbon monoxide](#), and at these levels, the gas serves useful functions by interacting with and regulating signaling proteins. Studies in cells and animals have shown that carbon monoxide can suppress inflammation, protect tissues from oxidative stress and prevent cell death, Contributing Editor Alla Katsnelson writes. Other research suggests that the versatile molecule could help treat many diseases, ranging from sepsis to cancer, but first scientists must find safe, effective ways to deliver the gas inside the body.

Although [clinical trials](#) have shown that inhaling small, controlled amounts of carbon monoxide is safe, such treatments would need to be done in a hospital setting. Therefore, scientists are exploring other delivery options, such as pill and liquid forms. Multiple research groups are developing prodrugs—compounds that release carbon monoxide after undergoing a chemical reaction inside the body. A company called Hillhurst Biopharmaceuticals plans to conduct clinical trials on a liquid

carbon monoxide formulation they developed to treat sickle cell disease. And others are planning trials of the inhaled gas to see if it can improve outcomes in lung transplants. These researchers are hoping that the good side of carbon monoxide will soon see the light of day, Katsnelson writes.

More information: "Carbon monoxide can be deadly. But researchers want to use it for good," cen.acs.org/pharmaceuticals/drugs/researchers-want/97/i45

Provided by American Chemical Society

Citation: The good side of carbon monoxide (2019, November 20) retrieved 26 June 2024 from <https://phys.org/news/2019-11-good-side-carbon-monoxide.html>

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