



Environmental Health Fact Sheet

What is Oxidative Stress?

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The Community Outreach and Engagement Core (COEC) increases awareness and understanding of environmental health research.

Stakeholder Advisory Board members include:

- Community Health and Social Services Center, Inc.
- Detroit Hispanic Development Corporation
- Detroiters Working for Environmental Justice
- Institute for Population Health
- Green Door Initiative
- Henry Ford Health System
- Eastside Community Network
- Michigan Department of Community Health
- University of Michigan School of Public Health

What Happens When I Take a Breath?

With every breath we take, 20% of what we inhale is oxygen. Oxygen is an essential molecule that moves from the air in our lungs to our red blood cells. Our red blood cells then deliver oxygen to every cell in our body. There, oxygen gives cells life by creating energy to support cell functions. This process is called **oxidation**, and we could not live without it. It is the same process that is responsible for a cut apple exposed to air turning brown or copper eventually turning green.

The process of oxidation creates **free radicals** in our cells. A free radical is an atom with an odd or free electron. In large portions, free radicals can cause damage to cells.

Consuming foods that are rich in **anti-oxidants** can inactivate free oxygen radicals and reduce the hazardous effects of free radicals.

What is Oxidative Stress?

Oxidative stress occurs when there is an imbalance in our cells due to either an *increase* in free radicals and/or a *decrease* in antioxidants. Over time this disruption in the balance between free radicals and antioxidants can injure our tissues.

Common Sources of Free Radicals	Common Sources of Anti-oxidants
<ul style="list-style-type: none"> • Cigarette smoking • Air pollution • Radiation • UV light (such as sunlight) • Excessive alcohol/drug use 	<ul style="list-style-type: none"> • Dark chocolate • Tea & coffee • Fruits & vegetables • Nuts (such as pecans and walnuts,) • Spices (cinnamon, oregano) • Beans (such as red, kidney, pinto)

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Indoor and Outdoor Air Pollution Exposure

Most people are aware that smoking is bad for everyone's health. Fewer people know that one of the reasons why is *oxidative stress*. When people inhale smoke and other forms of air pollution, it creates free radicals that damage health.



Linkages to Health

Oxidative stress has been linked to a number of illnesses, including some forms of cancer, cardiovascular disease, obesity, diabetes, Alzheimer's disease, eye diseases, Lupus, and other illnesses. Many of these could be prevented with the proper balance of oxidative stress and *antioxidant* levels.



Current Research

There is still much to be understood about how to achieve the proper balance between oxidative stress and antioxidant levels. You can't see or feel the imbalance; the first warning may be when a disease condition occurs. Researchers in the Environmental Health Science Core Center of the University of Michigan are engaged in research to better understand how oxidative stress impacts, asthma, cardiovascular disease, preterm birth, aging, and Lupus.



What Does this Mean for Me and My Community?

If you live or work where you are exposed to higher levels of air pollution, smoke from cigarettes, or if you have higher than normal levels of stress in your life, a diet rich in antioxidants may help to ward off the negative effects of oxidative stress.



Here are some steps you can take to reduce oxidative stress in Detroit and Southeast Michigan:

- Work with others to advocate for regulations that decrease exposure to air pollution from cars and trucks, as well as industrial sources
- Work with others to promote access to healthy, affordable foods
- Carpool, use public transit, and walk when possible
- Consume more foods that are rich in antioxidants, such as fruits and vegetables
- Avoid exposure to cigarette smoke & other environmental pollutants
- Increase antioxidant defenses by exercising regularly

The University of Michigan Environmental Health Science Center of Excellence promotes collaboration among UM environmental health researchers and communities. Researchers work together to advance knowledge of environmental health issues that affect community members in Detroit and Southeast Michigan.

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