



NSIPM & Sano Wellness Center

Oxidative Stress

The body constantly reacts with oxygen as part of the energy producing process of cells. As a consequence of this activity, **highly reactive molecules** are produced known as **free radicals**. Free radicals are highly unstable molecules that interact with other molecules within cells, which can cause what is known as **oxidative stress and damage** to proteins, membranes, and genes causing cell degeneration. Free radicals set off a chain of events that have been implicated in the cause of many diseases such as fatigue, allergies, arthritis, elevated cholesterol, and degenerative heart disease to name a few. Free radicals have a significant impact upon the aging process.

Free radicals are, more specifically, molecular fragments that spontaneously react with adjacent molecules within 1/1000 of a second. This reaction results in the free radical stealing an electron from the adjacent molecule triggering a cascading, cell damaging process. To a degree this is necessary in order to break up protein, sugar and fat structures that are foreign to the body. However, if free radicals are not completely neutralized at the moment of creation, cell damage by free radicals occurs. **Especially affected** are the energy-generating organelle systems (mitochondria, the power plant of the cell). The process also depolarizes cell membranes.

It is the job of **antioxidants**, a highly effective group of protective agents, to **neutralize free radicals** and the body naturally produces a multitude of them to defend itself. **Unfortunately**, changes in our lifestyles, which include more exposure to environmental pollution and toxins, automobile exhaust, chemical laden diets, psychological stress, cigarette smoke, excessive alcohol, and ionizing radiation from industry, sun exposure, cosmic rays, and medical x-rays, mean that **we are exposed to more free radicals than ever before**. Chronic viral, bacterial, and fungal infections also add to our free radical load. Most people's internal production of antioxidants have become **insufficient** to neutralize, scavenge, and control these radicals and repair the ensuing damage.

Excess free radical activity causes changes that can start with minor inflammations and can progress to cancer and genetic damage. Even the aging process is accelerated.

It is important to note however, that **free radicals are also necessary to some degree**. They act as cell signaling or messenger agents and also play a role in normal cellular function as well. Therefore, there is such a thing as having excessive amounts of antioxidant activity. For example, when too many antioxidants are available it becomes difficult for cells to efficiently produce the energy molecule ATP and impaired cellular function can follow.

Testing for levels of oxidative and free radical activity is a critical step in maintaining health and slowing the aging process. **Support of the free radical scavenger system** in order to keep free radicals in check is critically important in delivering any form of healthcare.

The oxidative stress test is a test of true cellular stress and potential damage due to free radicals.

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