

Chocolate, tea or coffee with zinc could reduce oxidative stress

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Ageing and a low life expectancy are caused, at least partly, by oxidative stress. A team of researchers led by Prof. Dr. Ivana Ivanovi-Burmazovi from the Chair of Bioinorganic Chemistry at Friedrich-Alexander-

Universität Erlangen-Nürnberg (FAU), together with researchers from the USA, have discovered that zinc can activate an organic molecule helping to protect against oxidative stress.

Zinc is a trace mineral humans need in order to remain healthy. FAU researchers working together with Prof. Dr. Christian Goldsmith from Auburn University, Alabama, U.S., have discovered that [zinc](#) can protect against the superoxide responsible for oxidative stress when taken together with a component found in foodstuffs such as wine, coffee, tea and chocolate. This component is a hydroquinone group found in polyphenols—the plant substances responsible for smell and taste. Zinc activates the hydroquinone groups, producing natural protection against superoxide, a byproduct of human cell respiration that damages the body's own biomolecules, for example, proteins or lipids, as well as the human genome. Superoxide is thought to have a role to play in the ageing process and a number of illnesses such as inflammation, cancer or neurodegenerative diseases.

New metal complex against superoxide

Hydroquinone alone is not capable of breaking down superoxide. If zinc and hydroquinone combine, however, a [metal complex](#) is created which imitates a superoxide dismutase enzyme (SOD). These enzymes protect the body from the degradation processes caused by oxidation and have an antioxidative [effect](#). In this way, the [superoxide](#) can be metabolised and damage to the organism prevented; oxidative [stress](#) is avoided.

Chocolate, coffee etc. with added zinc

For the first time, the function of this enzyme has been copied without reverting to redox-active transition metals such as manganese, iron, copper or nickel. While the metals could also have an antioxidative

effect, any positive effects are quickly outweighed by the fact that if too much is taken, they can increase [oxidative stress](#). Zinc is much less toxic than the transition metals mentioned above, making it possible to create new medication or supplements with considerably fewer side effects. It would also be plausible to add zinc to food containing hydroquinone naturally to boost health. "It is certainly possible that wine, coffee, tea or chocolate may well be available in the future with added zinc. However, any alcohol content whatsoever would destroy the positive effects of this combination," says Ivana Ivanovi-Burmazovi.

More information: Meghan B. Ward et al, Superoxide dismutase activity enabled by a redox-active ligand rather than metal, *Nature Chemistry* (2018). [DOI: 10.1038/s41557-018-0137-1](https://doi.org/10.1038/s41557-018-0137-1)

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