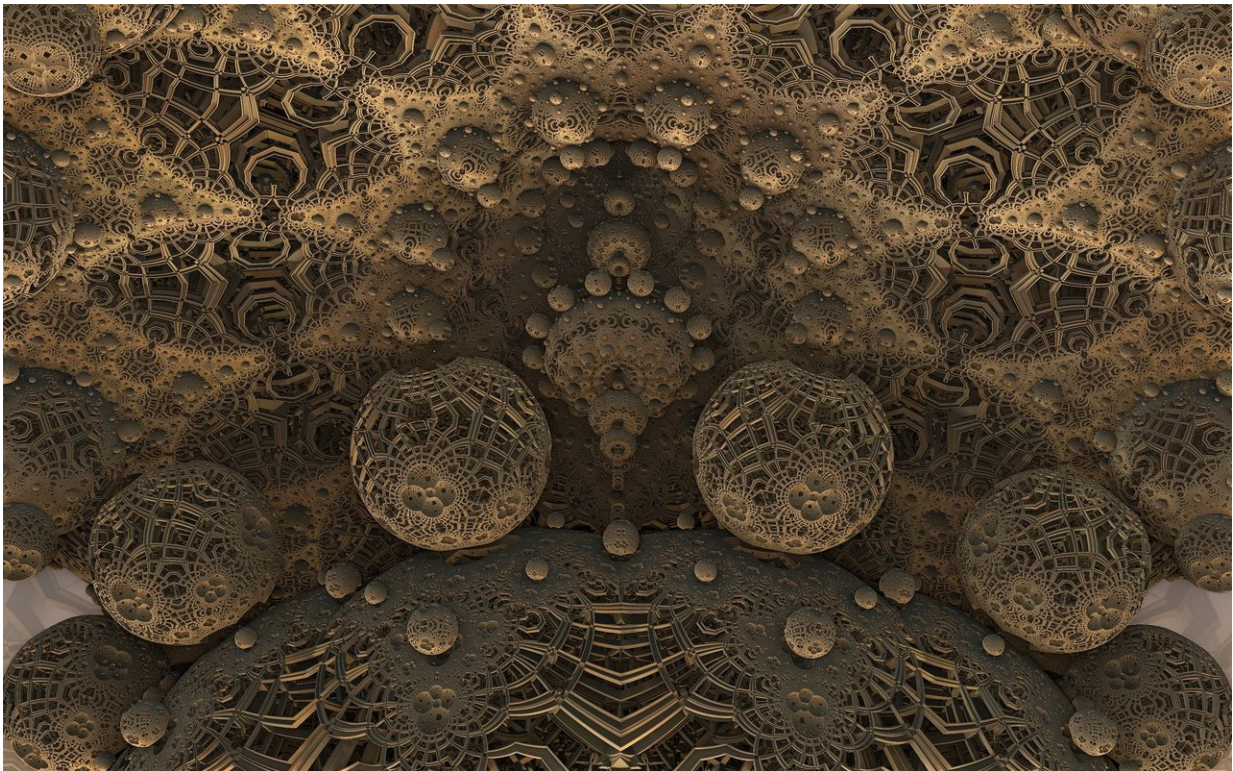


Nanoparticles in the environment more harmful than thought

August 21 2018, by Birgitte Svennevig



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Nanoparticles are becoming increasingly widespread in the environment. Thousands of products contain nanoparticles, which have unique properties.

Silver [nanoparticles](#) are one example. They have an effective antibacterial effect and can be found in refrigerators, sports clothes, cosmetics, toothbrushes and water filters. Professor Frank Kjeldsen, SDU, conducted a cell study with results that he finds concerning. The results are published in *Nanotoxicology*.

There is a significant difference between how cells react when exposed to nanosilver alone and when they are exposed to a cocktail of nanosilver and cadmium ions. Cadmium ions are naturally found everywhere on Earth.

The study was conducted on human liver cancer cells. In the study, 72 percent of the cells died when exposed to both nanosilver and cadmium ions. When exposed to [nanosilver](#) only, 25 percent died. When exposed to [cadmium](#) ions only, 12 percent died.

"This study indicates that we should not look at nanoparticles in isolation when we investigate and discuss the effects they may have on our health. We need to also account for potential synergistic effects," said Professor Frank Kjeldsen, Dept of Biochemistry and Molecular Biology, SDU, adding: "Industry is not well regulated—products with nanoparticles are being developed and manufactured every day, but in many countries there are no regulations, so there is no way of knowing what and how many nanoparticles are being released into the environment. In my opinion, this should be stopped," says Kjeldsen.

Other studies led by Professor Kjeldsen have previously shown that human cells interact with [metal nanoparticles](#). One study showed that nano-silver leads to the formation of free radicals in cells and causes changes in the form and amount of proteins. Many serious diseases are characterized by an overproduction of [free radicals](#) in cells. This applies to cancer and neurological diseases such as Alzheimer's and Parkinson's.

More information: Renata Rank Miranda et al. Co-exposure to silver nanoparticles and cadmium induce metabolic adaptation in HepG2 cells, *Nanotoxicology* (2018). [DOI: 10.1080/17435390.2018.1489987](https://doi.org/10.1080/17435390.2018.1489987)

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