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2020 marks the start of the quantum dot revolution.

Completely ignoring the fact that "photocatalytic generation of reactive oxygen species (ROS) from quantum dots (QDs) has been widely reported."

Results: It was found that whereas singlet oxygen (1O2) was not produced by photoexcited QDs, superoxide anion(O2–)and hydroxyl radicals(OH) were generated by QDs, especially in the presence of a physiological concentration of electron donating agent including NADH.

Using cell metabolic activity assays and various probes of ROS generation, the formation of ROS in cellular environments was demonstrated.

Conclusion: Illumination of QD-treated cells and bacteria with light did affect viability. The above results, together with those of assays in the presence of various scavengers of specific ROS, indicate that the formation of ROS by QDs mainly proceeded via electron transfer.

Some electrons are directly transferred to O2 to generate reactive oxygen species (ROS) in the ETC.

... As signaling molecules, ROS play an important role in cell proliferation, hypoxia adaptation and cell fate determination, but excessive ROS can cause irreversible cell damage and even cell death.

Electron transfer is a process by which an electron moves from one atom or molecule to another. It is a key concept in redox chemistry – the chemistry of reactions where one reaction partner loses electrons (oxidation) while the other gains electrons (reduction).

Ferric means the iron atom has lost three electrons to form Fe+3, and ferrous means the iron atom has lost two electrons to form Fe+2. ... For example, ferric would be Fe(III) indicating Fe+3, and ferrous would be Fe(II) indicating Fe+2.

Iron(III) oxide-hydroxide or ferric oxyhydroxide is the chemical compound of iron, oxygen, and hydrogen with formula FeO. The compound is often encountered as one of its hydrates, FeO·nH ■O [Rust].

Similar behavior is exhibited by some iron compounds, such as the ferrites and the mineral magnetite, a crystalline form of the mixed iron(II,III) oxide Fe_3O_4 (although the atomic-scale mechanism, ferrimagnetism, is somewhat different).

https://t.co/TPBtYuGPVR

So basically superparamagnetic piezoelectric crystalline nanoparticles dressed up as viruses do indeed cause oxidative stress related diseases.

Activated by light?