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Nanoparticles and DNA damage

Nanoparticles or NPs are known to cause DNA damage for over at least the past decades, but the causal relation of NPs to human health remains unknown. Chemical reactions of NPs with the DNA cannot be the causal relation as DNA damage occurs even with inert gold NPs suggesting a physical causal relation such as high temperature. Photodynamic therapy is thought to kill cancer cells by high temperatures in laser heating of NPs. Although the laser increases the temperature of surrounding tissue, the NP temperature itself does not because the Planck law of QM requires the NP heat capacity to vanish. QM stands for quantum mechanics. Contrarily, photodynamic therapy does not induce necrosis of cancers by increasing the temperature of the quantum sized NPs and instead NPs produce EM radiation beyond the UV that induces cancer necrosis suggesting the causal relation of NPs to human health is therefore the well-known genotoxicity of DNA to UV radiation. The wavelength λ of the emitted EM radiation is, $\lambda = 2nd$, where n and d are the refractive index and diameter of the NP. For NPs having $n=1.5$, DNA damage for EM radiation beyond the UVC ($\lambda < 254$ nm) occurs for NP diameters $d < 85$ nm. Solar UV is only thought to cause DNA damage to the skin and may lead to cancer, but cannot penetrate the skin to damage internal organs. However, NPs rescind this paradigm. Indeed, NPs by entering the body in the GM food we eat produce the low levels UV to damage the DNA of tissue in the gut and digestive tract. The DNA damage from GM food that includes NPs in Monsanto's Roundup herbicide enhances crop yields by controlling weeds in modern agriculture are discussed. To avoid genetic cancers in human DNA evolution, herbicide manufacturers should stop use of NPs in controlling weeds.

Biography

Thomas Prevenslik has developed the simple theory of QED based on the Planck law of QM.

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