COVID-19 UVC TREATMENT

THOMAS PREVENSLIK

QED Radiations, Berlin 10777, Germany

Email: thomas@nanoqed.org
Contact: +49 0175 506 7507

Abstract: Classical physics allows the atom to have heat capacity at the nanoscale, the conservation of heat proceeding by a change in temperature. However, simple QED based on the Planck law of quantum mechanics denies the atom in nanostructures the heat capacity to conserve heat by a change in temperature, the consequence of which is heat is conserved by creating standing EM radiation that is released to the surroundings. UVC radiation is known to disinfect Coronavirus in the air or on surrounding surfaces, but not inside body organs. In this regard, Covid-19 patients diagnosed positive for having the virus in their body are proposed disinfected by a single injection of ~80 nm lipid nanoparticles (NPs) selected to emit UVC radiation. Powered only by body heat, the NPs inactivate at least a few viruses to create the antigens necessary to elicit immunity that removes the remaining virus in the body. In effect, the UVC Treatment is an 'in vivo' vaccine. In the blood stream, the NPs may enter the brain and damage neurons and DNA, but brief UVC Treatments the risk of brain damage is expected to be minimal. CDC testing to determine acceptable NP doses is required.

Index terms: Area-efficient, Low power, CSLA, Binary to excess one converter, Multiplexer.

I. INTRODUCTION

The disinfection of viruses by UV radiation [1] has a long history. In 1877, microorganisms in test tubes containing Pasteur’s solution, an artificial nutrient fluid for cultivating organisms, upon exposure to sunlight prevented [2] the growth of the organisms for several months. About the same time, Tyndall confirmed [3] sunlight neutralized organisms dependent on intensity, duration, and wavelength, with the UV wavelengths of the solar spectrum being the most effective. However, the specific UV wavelengths of organism disinfection of about 260 nm were not identified [4] until 1944. Thereafter, the production of pyrimidine dimers in DNA that block virus reproduction was demonstrated after exposure to UV radiation, thereby providing the basis for UV disinfection of biological systems.

In 2020, UV disinfection of viruses became of great importance. The Coronavirus known as Covid-19 became a pandemic that changed the economic future of the world, although in severity only comparable to influenza. Nevertheless, there is no vaccine or specific treatment known for Covid-19. In this regard, Covid-19 disinfection by external UV radiation sources would resolve the pandemic research, but only if the virus is still in the air or on the surface of surroundings.

In the usual Covid-19 infection, the virus has infected the blood stream and internal organs including the brain and lungs. External UV radiation no longer works, but no source of UV radiation is known within the human body.

Recently, the proposal [5] was made to use nanoparticles (NPs) to attach to the virus in combination with IR light to cause a structural change that stops the ability of the virus to survive and reproduce. However, the structural change necessary to produce UV radiation to disinfect the Coronavirus is not identified.

II. PURPOSE

The purpose of this paper is to present the simple QED theory [6] of nanoscale heat transfer to explain how NPs can produce UV radiation within the human body to disinfect the Covid-19 virus. Developed over the past decade, simple QED can be implemented in vaccinations or specific treatments without long FDA approval as the FDA has approved aluminium adjuvants containing NPs in vaccines since the early1920's.

However, UV radiation may also damage brain neurons and DNA, but is damage is expected to be minimal in the brief time necessary to disinfect the Covid-19 virus. The UVC radiation emitted from lipid NPs powered by heat in blood and tissue at normal body temperature illustrates the ease at which Covid-19 is disinfected as shown in Fig. 1.

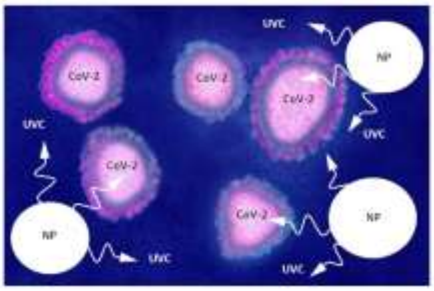

Figure 1. UVC Treatment by nanoparticles

III. BACKGROUND AND THEORY

Simple QED is a nanoscale heat transfer process based on the Planck law [7] of quantum mechanics (QM) differing significantly from that of classical physics. Research in nanoscale heat transfer [8-10] has advanced over the past decades, and a large number of interesting phenomena have been reported. But despite the advances in nanotechnology, there are still challenges existing in understanding the mechanism of nanoscale thermal transport. Perhaps, researchers have not appreciated the significant difference between classical physics and the Planck law with regard to the heat capacity of the atom without which nanoscale heat transfer cannot proceed.

In this regard, the Planck law denies atoms in nanostructures the heat capacity to change temperature upon the absorption of heat - a difficult notion to accept because of training in classical physics. Heat transfer without changes in temperature preclude the Fourier law of heat conduction commonly used in nanoscale heat transfer. Similarly, the Stefan-Boltzmann law for radiative heat transfer depending on temperature is not applicable to nanostructures. Although valid at the macroscale, the Fourier law and Stefan-Boltzmann equation are invalid at the nanoscale. Molecular Dynamics (MD) simulations [11] based on classical physics thought to provide an understanding of the atomic response to thermal disturbances assume atoms in nanostructures have temperature. Although MD is valid for periodic boundary conditions in the atomic response at the macroscale, extension to discrete nanostructures in is not valid Researchers need both new theory and computational procedures to be developed to understand nanoscale heat transfer.

Simple QED is a method of nanoscale heat transfer analysis that conserves heat with EM radiation instead of temperature. QED stands for quantum electrodynamics, a complex theory based on virtual photons advanced by Feynman [12] and others. In contrast, simple QED is a far simpler theory based on the Planck law that only requires the heat capacity of the atoms in nanostructures to vanish allowing conservation to proceed by the creation of real photons comprising EM waves that stand within and across the nanostructure. Unlike electron level quantum states, simple QED quantum states are size dependent based on the dimension of the nanostructure over which the EM waves stand.

By classical physics, the kT heat capacity of the atom is independent of the EM confinement wavelength λ, where k is the Boltzmann constant and T absolute temperature. QM differs as the heat capacity of the atom decreases under EM confinement $\lambda < 200$ microns, and vanishes at the nanoscale for $\lambda < 100$ nm, the heat capacity may be said to vanish. The Planck law at 300 K is illustrated in Fig. 2.

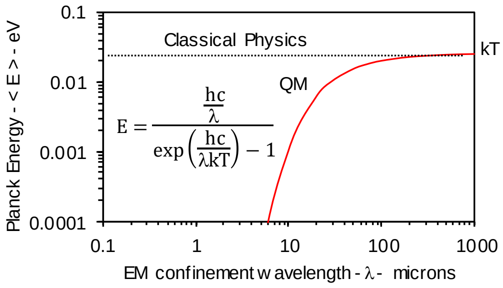

Figure. 2: Planck law of the Atom at 300 °K
In the inset, E is Planck energy, h Planck's constant, c light speed, k Boltzmann's constant, T temperature, and λ the EM wavelength.

EM confinement occurs by the high surface-to-volume (S/V) ratio of nanostructures that requires the heat Q to almost totally be confined over the full surface, the surface heat itself as EM energy providing the brief EM confinement necessary to create EM waves standing across the internal dimension d of the nanostructure. For light having wavelength $\lambda < d$, the absorption occurs over the incident face of the NP. However, heat is usually considered to be FIR radiation where $\lambda >> d$ with the heat fully immersing the NP and absorbed uniformly over the full surface. Fig. 3 illustrates $\lambda >> d$ with heat - yellow- immersing the NP and absorbed in penetration depth δ over the full NP surface.

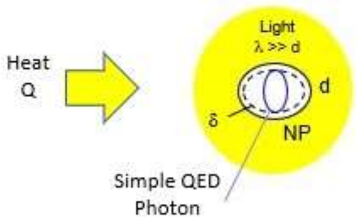

Figure 3. Heat Q (or light) absorbed in full NP surface

Simple QED absorbs heat Q in the NP surface given by the penetration δ depth. Unable to conserve the surface heat by a change in temperature, conservation requires the creation of simple QED radiation, the time τ to create the standing wave, $\tau = 2d/(c/n)$. The Planck energy $E \sim h/\tau = hc/2nd$ having wavelength $\lambda = 2nd$ depends on the refractive index n of the NP to correct for the velocity c of light within the NP. The simple QED Planck energy E is quantized by the dimension d of the NP that defines the half-wavelength λ/2 of the nanostructure.

In a rectangular NP with different dimensions of width, thickness, and length there are 3 simple QED quantum states corresponding to the different dimensions of the NP. However, only the minimum dimension is important as by Fermat's principle, the absorbed heat is dissipated in minimum time.

IV. APPLICATION

Classically, all atoms in the NP at equilibrium have temperature T equal to the bath temperature. In terms of the Boltzmann constant k and the number N of atoms, the total NP thermal energy U is,

$$U = \frac{3}{2}NkT$$

However, by the Planck law the N atoms do not have kT energy. Instead, simple QED conserves the energy U that otherwise would occupy the 80 nm LNP by creating standing EM radiation across the NP diameter d as shown in Fig. 4.

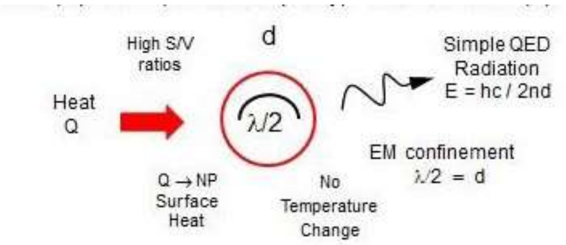

Figure. 4: Planck Energy of EM Radiation

The molecular weight of the lipid meibomian C44H56O2 is 616 and the number Nm of molecules is, Nm = (ρV/616)·Av, with volume $V = \pi d^3/6 = 2.68 \times 10^{-22}$ m^3, density ρ = 1000 kg/m^3 and Avagadro's number Av = 6.023 x 10^{26} mols/kg-mol. Hence, Nm = 2.62x10^5. For N = 102 Nm = 26.7 million atoms, U ~ 1 MeV. For E = hc/λ at λ = 254 nm, E ~ 4.88 eV and the lipid NP creates about ~ 200,000 UVC photons upon equilibrating with the 300 °K thermal bath temperature.

Once created, the emitted UVC photons are absorbed by the Covid-19 virus or water bath, the bath temperature T once again produces the number of ~ 200,000 UVC photons repetitively.

CONCLUSIONS

In simple QED, the Planck law allows lipid NPs to produce UVC radiation that disinfects the Covid-19 from the heat at body temperature, a significant difference with classical physics that predicts the lipid NP only acquires the temperature of the bath.

With regard to Covid-19 disinfection treatments, simple QED produces UVC from ~ 80 nm lipid NPs using only the thermal energy of the surrounding blood and tissue.

In the manner of an *in vivo* Covid-19 vaccine, the UVC treatment kills some live virus to produce the inactivated virus that then act as the antigen to elicit immunity from the remaining and future Covod-19 virus in the patient.

The CDC is requested to conduct UVC Treatment tests on lipid NPs program to show:

Lipid NPs > 100 nm produce VIS and IR are s unlikely to inactivate live virus to produce necessary antigens.

UVC is required to produce antigens that requires 70 < NPs < 100 nm.

EUV from NPs < 70 nm also inactivates live virus, but causes greater DNA damage than at UVC levels suggesting UVC Treatment use 70 – 100 nm NPs.

The FDA is requested to approve UVC disinfection of Covid-19 in vaccinations of ~ 80 nm lipid NPs in small quantities as the FDA has approved adjuvants containing NPs since 1920. In the blood stream, the disinfection would be rapid, but the NPs may enter the brain and damage neurons and DNA. However, damage is expected to be minimal evidenced by the long history of NPs in vaccines. CDC testing to determine acceptable NP dose levels is required.

REFERENCES

[1] N. G. Reed, "The History of Ultraviolet Germicidal Irradiation for Air Disinfection," Public Health Reports, vol. 125, pp. 5-27, 2010.
[2] A. Downes and T. P. Blunt, "Researches on the effect of light upon bacteria and other organisms," Proc R Soc London, vol. 26, pp. 488-500, 1877.
[3] J. Tyndall, "Note on the influence exercised by light on organic infusions," Proc R Soc London, vol. 28, pp. 212-3, 1878.
[4] A. Hollaender and J. W. Oliphant, "The inactivating effect of monochromatic ultraviolet radiation on influenza virus," J Bacteriol, vol. 48, pp. 447-54, 1944.
[5] R. M. Candanos, "Here's how nanoparticles could help us get closer to a treatment for COVID-19," https://phys.org/news/2020-03-nanoparticles-closer-reatment-covid-.html
[6] T. Prevenslik, "Simple QED Applications," See https://www.nanoqed.org at 2010-2020.
[7] M. Planck, "On the Theory of the Energy Distribution Law of the Normal Spectrum," Verhandl. Dtsch. Phys. Ges., vol. 2, pp. 2-37, 1900.
[8] D. G. Cahill, et al. "Nanoscale thermal transport," Appl. Phys. vol. 93, pp. 93–818, 2003.
[9] G. Chen, *Nanoscale energy transport and conversion: parallel treatment of electrons, molecules, phonons, and photons*, Oxford University Press, 2005.
[10] D. G. Cahill, et al. "Nanoscale thermal transport. II. 2003–2012," Appl. Phys. Rev. vol. 1, pp. 011305, 2014.
[11] D. Poulikakos, S. Arcidiacono, S. Muruyama, " Molecular Dynamics simulation in nanoscale Heat Transfer: a review,". Microscale Thermophysical Eng., vol. 7, pp.181–206. 2003.
[12] R. Feynman, *QED: The Strange Theory of Light and Matter*, Princeton University Press, 1976.
[13] J. M. Tiffany, "Refractive index of meibomian and other lipids," Current Eye Research - Short Communication. vol. 5, pp. 887-889, 1986.

★★★