QED

UV-C Disinfection of Ebola and Drinking Water

QED DISINFECTION OF EBOLA AND DRINKING WATER IN THE DEVELOPING WORLD

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Preferred Presentation Method: Oral or Poster Communication
I want to apply for a travel fellowship: No
I am submitting my abstract for the ICPIC Clip award: No

Introduction: The UV disinfection protocol in the West [1] is not only too complex and costly to be used in the developing world but requires sources of electricity usually not available.

Objectives: To provide people in the developing world with a means to disinfect both the Ebola virus and drinking water themselves using UV-C radiation from hand-held nano-coated bowls powered only by body heat.

Methods: QED induced EM radiation [2] from body heat in hand-held nano-coated bowls is proposed to disinfect the Ebola virus and drinking water. QED stands for quantum electrodynamics and EM for electromagnetic. By this theory, heat from the hand cannot increase the coating temperature because its heat capacity vanishes by quantum mechanics. Instead, body heat is conserved in the nano-coating by QED inducing the creation of EM radiation having wavelength λ depending on the coating thickness d and refractive index n, i.e., $\lambda = 2nd$. For example, a bowl comprising a thin-walled aluminum half-sphere (100 mm diameter x 50 mm high) that fits in the palm of one hand is provided on the inside surface with a 53 nm zinc-oxide coating having n = 2.4 to produce the UV-C. Since the UV-C intensity to disinfect [3] the Ebola virus is 0.4 mJ/cm^2, and since humans produce body heat of about 6 mW/cm^2, the protocol is to move the hand-held bowl over the area to be disinfected in < 1 second scans. Similarly, the 16-38 mJ/cm^2 of UV-C for pathogen disinfection [4] requires the water remain in the bowl for 3 to 6 seconds before drinking.

Results: Preliminary results expected for the ICPIC conference.

Conclusion: QED induced UV-C radiation from inexpensive hand-held zinc-oxide nano-coated aluminum bowls allo people in the developing world to disinfect the Ebola virus and drinking water themselves using only body heat. Cos the bowls are minimal and may be distributed freely by West African governments to their people. Support and func the development and testing of UV-C disinfection of Ebola and drinking water by the Innovation Academy is reques

References:

[1] Ferrero G. UV disinfection in developing Countries. UNESCO IHE, Delft, The Netherlands, November 6, 2014.
[2] Prevenslik, T. See diverse QED applications at http://www.nanoqed.org
[3] Vatansever F, et al., Can biowarfare agents be defeated with light? Virulence 2013;4:796–825.
[4] Ultraviolet Disinfection, National drinking water clearinghouse fact sheet, Tech Brief