Abstract Submitted
for the FWS20 Meeting of
The American Physical Society

Study on Antibiotics in Treating Epidemic Disease Using Physicochemical and Computational Medicines SEOJIN LEE, RICHARD KYUNG, CRG-NJ — As an alternative to polymers and metal based particles, physicochemical scientists are currently focusing on new classes, such as polyphenols, nanotubes and fullerenes, as aqueous dispersions for antibiotics utilized in the treatments of pandemic diseases. This research studied the ability of nano-scaled particles to reduce Reactive Oxygen Species (ROS) in cells, which stress cell structure (leading to damaged DNA and RNA), decrease membrane activity, alter metabolic activity, and cause detrimental side reactions that generate chemicals like peroxide. In this paper, physicochemical effects of commercially used synthetic drugs were analyzed using computational simulations. Also naturally produced by plants, often used in traditional oriental medicine to treat fever and inflammation, are observed and analyzed using density functional theory. Such compounds can selectively kill affected cells without being toxic to non-affected cells. Both physiological and pharmacological effects are modeled and analyzed.

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Date submitted: 17 Sep 2020 Electronic form version 1.4