



## **DR. NANO and Nano-Silver Titanium Dioxide**

The rapidly mutating and growing harmful substances in the current time make us susceptible to more diseases, such as Covid-19, SARS, E. Coli, H1N1, H7N9... etc. Many of us use diluted chlorine water (1:99) or alcohol as disinfectants to fight against them. However, in order to maintain the efficacy, frequent and regular reapplication by designated janitors is needed. Furthermore, chlorine itself is harmful and needs to be handled with due care.

Thanks to the two Japanese scientists Fujishima and Honda in mid 1960s who discovered the naturally mined titanium dioxide ( $\text{TiO}_2$ ) can decompose bacteria and viruses under the presence of UV light and it won't consume itself to perform such killings. Furthermore, the introduction of nanotechnology in 90s further enable  $\text{TiO}_2$  to become nano size material to provide 24-hours non-stop protection from bacteria and viruses for months and beyond, without the need of endless re-applications like chlorine or alcohol-based disinfectants. As long as the nano  $\text{TiO}_2$  particles remains intact on the surface of the sprayed area the bacteria/viruses decomposition ability is always there. Nowadays there are many common applications of titanium dioxide and they are found in milk, ice cream, cosmetics products, sunscreen and printing paper.

More than 2000 years ago Egyptians used silverware to hold food to protect their food from rotting. Silver is therefore known to people that it can kill bacteria and nowadays there are quite a great number of applications in medical area using silver and nano-silver to protect people from different kinds of infection. Nano-silver is different from  $\text{TiO}_2$  that it does not need UV light to energize its ability to kill bacteria and viruses.

CMT started researching on nano-silver and nano- $\text{TiO}_2$  since 2015 on their antibacterial efficacies & effectiveness. CMT started manufacturing disinfection products for service coatings in 2016. DR. NANO is CMT's new brand of disinfection products for global market. It has used both nano- $\text{TiO}_2$  and nano-silver together as its ingredients to enable full protection for customers from bacteria and viruses infections and contaminations 24 hours a day with or without UV light source.

In 2020 TUV carried out a test on CMT Nano-Silver  $\text{TiO}_2$  and certified the product is able to eliminate 99.997% of bacteria. The recent TUV test in 2021 proved CMT Nano-Silver  $\text{TiO}_2$  is also able to eliminate an average of 99.524% of bacteria after the product has been applied for 30 days. As there are no laboratories in this region who can provide testing on coronavirus to prove  $\text{TiO}_2$  can eliminate coronavirus CMT has located a number of well-known research institutes around the world who have carried out research and tests on nano-silver and nano- $\text{TiO}_2$

regarding their abilities to kill both bacteria and viruses such as Coronavirus and H1N1. Please see the attached research and test result papers written by the below-listed scientists and their corresponding universities and research laboratories on the details of their research, test and proof of using nano-TiO<sub>2</sub> and nano-silver to eliminate bacteria and viruses in different applications:

**1. An Antimicrobial TiO<sub>2</sub> Coating for reducing Hospital-Acquired Infection**

By Chi-Jen Chung,<sup>1,2</sup> Hsin-L Lin,<sup>1</sup> His-Kai Tsou,<sup>3</sup> Zhi-Yuan Shi,<sup>4</sup> Ju-Liang He<sup>1</sup>

<sup>1</sup> Department of Materials Science and Engineering, Feng Chia University, Taichung, Taiwan.

<sup>2</sup> Department of Dental Laboratory Technology, Central Taiwan University of Science and Technology, Taichung, Taiwan.

<sup>3</sup> Department of Neurosurgery, Taichung Veterans General Hospital, Taichung, Taiwan.

<sup>4</sup> Department of Infectious Diseases,, Taichung Veterans General Hospital, Taichung, Taiwan.

**2. In Vitro Inactivation of Human Coronavirus by Titania Nanoparticle Coatings and UVC Radiation: Throwing Light on SARS-CoV-2**

By Svetlana Khaiboullina<sup>1</sup>, Timsy Uppal<sup>1</sup>, Nikhil Dhabarde<sup>2</sup>, Vaidyanathan Ravi Subramanian<sup>2,3\*</sup> and Subhash C. Verma<sup>1\*</sup>

<sup>1</sup> Department of Microbiology and Immunology, University of Nevada, Reno School of Medicine, 1664 N Virginia Street, Reno, NV 89557; scverma@med.unr.edu

<sup>2</sup> Chemical and Materials Engineering Department, University of Nevada, Reno, LME 309, MS 388, 89557-NV; [ravisv@unr.edu](mailto:ravisv@unr.edu)

<sup>3</sup> GenNEXT Materials and Technologies, LLC

\* Correspondence: scverma@med.unr.edu; Tel.: 775-682-6743 (S.C.V.); ravisv@unr.edu; Tel.: 775-784-4686 (R.S.)

**3. Nanosilver particles in medical applications: synthesis, performance, and toxicity**

By Liangpeng Ge<sup>1-5,\*</sup> Qingtao Li<sup>2,3,6,\*</sup> Meng Wang<sup>2,3</sup> Jun Ouyang<sup>6</sup> Xiaojian Li<sup>7</sup> Malcolm MQ Xing<sup>2,3</sup>

<sup>1</sup> Chongqing Academy of Animal Sciences, Chongqing, People's Republic of China;

<sup>2</sup> Department of Mechanical and Manufacturing Engineering, Department of Biochemistry and Medical Genetics, University of Manitoba, Winnipeg, Canada;

<sup>3</sup> Manitoba Institute of Child Health, Winnipeg, Canada;

<sup>4</sup> Key Laboratory of Pig Industry Sciences, Ministry of Agriculture, Chongqing, People's Republic of China;

<sup>5</sup> Key Laboratory of Pig Industry Sciences, Chongqing, People's Republic of China;

<sup>6</sup> School of Basic Medical Science, Southern Medical University, Guangzhou, People's Republic of China;

<sup>7</sup> Department of Plastic Surgery, Nanfang Hospital, Guangzhou, People's Republic of China

\*These authors contributed equally to this work