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The superior antimicrobial activity of polyvinylpyrrolidone wrapped single walled carbon nanotubes (PVP-SWNTs): Unraveling the anti-physiologic path

Single wall carbon nanotubes (SWNTs) have attracted the attention of the scientific community because of their versatile character and diverse applications. SWNTs have been exploited in many fields of scientific interest. Though the molecule has demonstrated many capabilities, it suffers in regard to its physicochemical character of poor aqueous solubility because of its super hydrophobicity, which is especially important in regard to the areas involving pharmaceutical life sciences. The functionalization of SWNTs has been reported severally but the involved process can affect their intrinsic properties. The alternate advantageous approach is non-covalent functionalization by polymer wrapping. This presentation shall highlight our work on polymer wrapping, the involved solution chemistry in brief, the probable mechanism (3:1) of polymer wrapping and related impact in microbiology. The superior antimicrobial effect of PVP-SWNTS than those of SWNTs shall be discussed. Besides the conventional antimicrobial activity studies, the impact of antimicrobial agents upon the respiratory chains of the bacterium is a subject of particular interest. The respiration kinetics of *E. coli* against the PVP-SWNTS shall be presented to unravel the anti-physiologic role. In an attempt to reveal the mechanism of interaction of PVP-SWNTs with the active sites of the different respiratory proteins (Lactate oxidase, LDH, SDHE, NADH oxidase, Glycerol-3-phosphate dehydrogenase and Cytbd Oxidase) of bacterium *E. coli*, the computational study results shall be presented.

Biography

Minaketan Tripathy has obtained his Bachelor, Master (Pharmaceutics) and Doctoral degrees in the field of Pharmacy in the year 1998, 2001 and 2006 respectively. After serving different institutes in India as a Teacher, in March 2008, he has joined the Faculty of Pharmacy, Universiti Teknologi MARA, Malaysia as a Senior Lecturer and established the Laboratory of Fundamental of Pharmaceutics. He believes in trans-disciplinary research.

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