

The University of Texas at San Antonio

UTSA Physics and Astronomy



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Multifunctional 2D and 3D Nano Architecture for Environmental and Health Architecture

Although water is essential to human life, as per the World Health Organization (WHO), around 25% of global population does not have access to drinking water due to microbial hazards and it kills more than 7.6 million children every year via waterborne diseases. Even in 21st century, more than 90% cancer-associated deaths are caused by metastatic disease rather than primary tumors. Here we will discuss our contribution to develop nanoarchitecture based 2D and 3D nano-architecture platform via low-cost synthetic routes, which represent highly powerful platform for environmental and biological diagnosis. Next, we will discuss the utilization of nanoarchitecture based 2D and 3D substrate for ultrasensitive and selective diagnosis of infectious disease organisms and circulating tumor cells. After that, we will discuss the chemical design of three dimensional (3D) nanoporous membrane which has the capability for effective separation and disinfection of waterborne pathogen and toxic metals from environmental water sample. Finally, we will highlight the promises, major challenges and prospect of nanoarchitecture based application in bio-medical and environmental field.

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