

# A\*STAR Infectious Diseases Labs

Virtual Seminar hosted by Prof Laurent Renia

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**1 March 2021 | Monday | 11.00 am – 12.00 pm**

**Join Zoom Meeting: [LINK](#)  
Meeting ID: 960 1924 8091  
Passcode: 179002**

*Seminar is open for all to attend.*

*Registration is not required.*



## Nanostructured Materials and Systems for Diagnostic and Biomaterial Applications

Nanotechnology allows for the unique design and functionalization of materials and devices at the nanometer scale for a variety of applications. Our laboratory has fabricated nanosystems for drug screening, *in vitro* toxicology, diagnostic, and food pathogen detection. The miniaturized devices allow for the rapid and automated processing of drug candidates, clinical and food samples in tiny volumes, greatly facilitating drug testing, infectious disease detection, cancer diagnosis, genotyping assays, point-of-care monitoring, and food testing.

For example, we have established paper-based assays for the inexpensive and rapid detection of various diseases, such as Dengue, Zika, hepatitis and sexually transmitted diseases, as well as food pathogens. We have also developed lab-on-a-chip system that enables us to achieve multiplexed detection of drug-resistant bacteria. In addition, we have designed plasmonic nanocrystals for single nucleotide polymorphism (SNP) genotyping. The platform involves polymerase chain reaction (PCR) for target sequence amplification and colorimetric detection with nanoprobe for pharmacogenomic applications.

Bioinspired nanocomposites are developed for various biomedical applications. These materials can be synthesized with unique carrier materials that offer synergistic therapeutic effects with the drugs to be delivered. Nanomaterials can be tailored for antimicrobial and antifouling applications. In addition, nanostructure processing has been employed in creating synthetic cell culture substrates for the effective expansion of stem cells. Nanotechnology has also been combined with microfabrication to develop microfluidic systems for *in vitro* toxicology applications.