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NANOENGINEERING PH.D. CANDIDATE
ZHANG RESEARCH GROUP

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1:00pm

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“Biointerfacing Via Cell Membrane-Coated Nanoparticles for Novel Antibacterial Nanotherapeutics”

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Abstract: Antibiotic resistance has become an undeniable burden on global health as we move further into the twenty-first century. It is predicted that drug-resistant infections could lead to an annual mortality rate of 10 million people by 2050 and a cumulative cost of up to 100 trillion USD on the world’s economy. These unsettling projections have necessitated the exploration of new and more effective ways to manage bacterial infection. This dissertation focuses on novel strategies for addressing this pressing challenge via nanomedicine, particularly the use of natural cell-derived membrane to enhance the biointerfacing of synthetic nanomaterials. The resulting membrane-cloaked platforms exhibit unique, cell-specific properties that can be leveraged for antibacterial therapy. Additionally, novel nano/micromotors are further exploited to design new biomimetic therapeutic modalities capable of active movement. The first part of the dissertation will focus on novel antibiotic delivery systems, including targeted delivery and active delivery platforms. The second portion will focus on the exploitation of biomimicking nanoplateforms as countermeasures against pathologic moieties for the abrogation of bacterial infection. Ultimately, cell membrane-coated technology has the potential to greatly impact the landscape of nanomedicine and is anticipated to contribute to the management of bacterial infections in the future.

Biosketch: Pavimol Angsantikul was born in Bangkok, Thailand. She received her B.E. in Nano Engineering (*summa cum laude*) from Chulalongkorn University in 2012.