

6th Asia-Pacific Pharma Congress

July 11-13, 2016 Kuala Lumpur, Malaysia

Controlled synthesis, modification and assembly of multifunctional nanoparticles for targeted drug delivery system

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Nanotechnology has received extraordinary attention recently due to its burgeoning role in pharmaceutical research. The materials composing the nanoparticles produce fascinating and diverse functionalities as a result of their exceptionally small size. Size control, both during synthesis and in particle suspensions, is a sine qua non for functionality. This can be accomplished by masking the particle surface with a multitude of different ligands. Ligands are essentially fungible and can be exchanged at various times to confer the desired properties to the particle. This can include protecting the particle from harsh aqueous conditions, such as pH extremes, maximizing optical properties for diagnostics or shielding the particle from potentially hostile conditions found in the body. The design of the ligand can have crucial effects on bio-distribution as well as evasion of biological defenses. Ligands can even be designed to provide new functionality in response to various environmental stimuli to improve their therapeutic or diagnostic capabilities. Clever combination of different nanoscale materials via ligand directed self-assembly will lead to the development of multifunctional nano-biomedical platforms for advanced drug delivery system such as simultaneous targeted delivery, fast diagnosis, and efficient therapy.

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Natural remedies: The futuristic therapy for antibiotic resistant superbugs

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Imagine being sick in the hospital with a bacterial infection and doctors can't stop it from spreading. This so-called "superbug" scenario is not science fiction. It's an urgent, worldwide worry that is prompting swift action. Antibiotic-resistant illnesses currently kill an estimated 700,000 people a year globally. By 2050, these illnesses are expected to kill 10 million people. Based on recent research, it could be even worse and coming even sooner. Ancient remedies, including essential oils and their components, have been explored as a source of new antimicrobials. Many are known to possess significant antimicrobial activity against a wide range of microorganisms. Additionally, combination of existing drugs with essential oils and/or components may provide an alternative approach to combat emerging drug resistance. Since antibiotic resistance is currently outpacing research and development to find new drugs, humanity is facing a return to the 'pre-antibiotic era'. Perhaps the remedies of the past combined with scientific study may provide the antibiotics of tomorrow. The present paper emphasized the role of Natural Remedies for Antibiotic Resistant superbugs.

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