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Chitosan-metal nanohybrids for microbial detection and extraction

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Nowadays, environmental problems, for example, climate changes, overpopulation, and emerging and re-emerging diseases are considered as the global issues obstructing the human activities. In fact, environmental healthrelated problems are derived from several microbialforwhich an accurate and early detection and separation is a way to prevent the spread over. Therefore, specific sensors and/or effective extraction to detect the types of microbial are important. On this viewpoint, polymeric nanomaterials can be developed to obtain the materials as desired. For the past decades, our group focuses on functionalization of chitosan in water-based system for biomedical purposes. Here, we consider chitosan-metal nanoparticles so that the materials obtained are satisfied for microbial detections and extraction. The presentation covers the preparation of chitosan hybridized with metal nanoparticles,i.e. magnetic and gold nanoparticles, including the model studies on bacteria and fungi detection/extraction. The presentation also extends to the system in which we can entrap-release metal nanoparticles to isolate the metal nanoparticles which was hybridized with chitosan after use.Based on this concept, we demonstrate the way to fabricate the naturally abundant biomaterial, i.e. chitosan to be nano-biosensors which are simple, effective and practical for environmental health's purposes.

Author: Prof. CHIRACHANCHAI, Suwabun (Chulalongkorn University)

Presenter: Prof. CHIRACHANCHAI, Suwabun (Chulalongkorn University)

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