Smart Drug Delivery and Diagnosis Applications with Micro/Nanomotors in Breast Cancer

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Breast cancer is one of the most common cancer types, particularly in women which has severe effects and can cause still deaths. To prevent the fatal effects of this disease, its early detection is important. Even with its early detection and by the control of all risk factors, it is known that all these precautions may minimize the cancer development in low percentages [1-4]. Conventional treatments at advanced stages of breast cancer is currently not effective as desired. In addition to this, there is still need for the development of handy diagnosis systems to fight against breast cancer.

Engineered micro/nanomotors for different applications such as biomedical ones have been pointed out a substantial field of research. With efficient surface modifications and controlled propulsion mechanisms, synthetic motors can realize important tasks including smart drug delivery, phototherapy, (bio)sensing, and cell isolation [5-8]. Using the advances in materials science and nanotechnology, micro/nanomotors have been remarkable intermediates to assist cancer therapy and diagnosis. In this talk, applications of the polymeric and metallic motors (magnetic and catalytic) developed in our laboratory for potential breast cancer treatment and diagnosis will be presented. Such motors can response to physicochemical changes in their environment, and therefore serve as promising drug carriers. Furthermore, they can utilize as recognition platforms with effective prognostic antibody functionalization. Besides their biomedical applications, these functionalized motors will be introduced in terms of surface characteristics and viability studies.

References

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