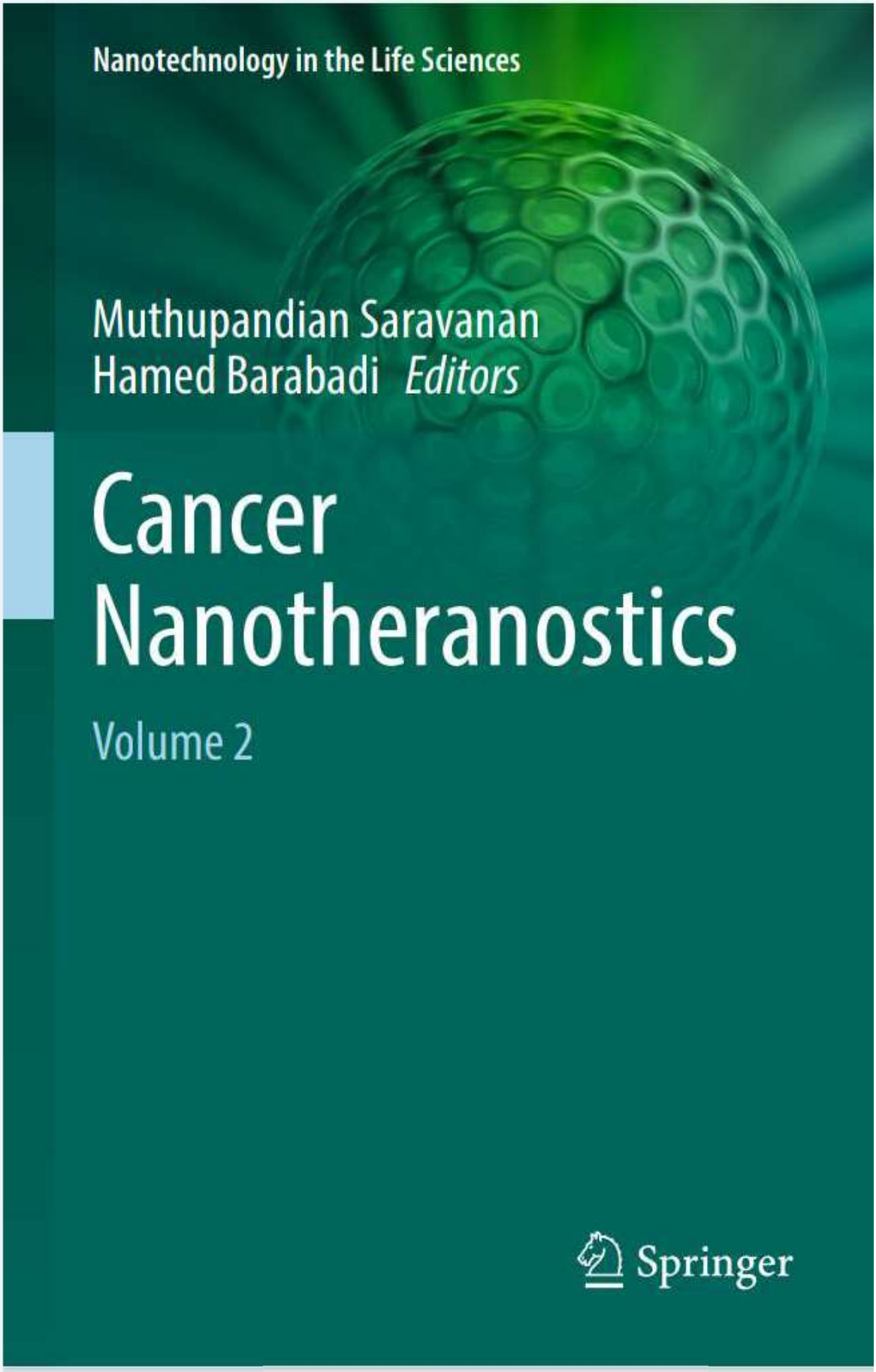
Nanotechnology in the Life Sciences



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Cancer Nanotheranostics

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Chapter 10
Nanoerythrosome-Biohybrid Microswimmers for Cancer Theranostics Cargo Delivery

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Introduction

Cancer causes about ten million deaths in 2018, and globally it is the second leading cause of cardiovascular disease. Malignant tumor was invigorated by the alteration of precancerous lesion which develops cancer as multiplex processes. Cancerous cells multiply and grow to other organs in the body, called metastases. For the survival of patients and to reduce the medication cost, it requires earlier observation of cancer and treatment (WHO, 2018). In spite of the notable developments in cancer treatment, particular side effects of chemotherapy and radiotherapy have yet to be discovered (Misra et al., 2010). Based on this matter, scientists put enormous results to evolve new nanomedication at the molecular level to treat cancer (Wu et al., 2015a; Zhang et al., 2019). Compared to free drugs, nanomedicines show high delivery efficiency, efficient retention time, lesser side effects, and prolonged circulation time (Gandhali, 2016). So, this encourages research related to nanoparticles, which would help to discover abnormalities or as carriers to transport drugs to the desired cell or as therapeutic means (Bharali et al., 2009). The concentration of

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Chapter 11
Role of Artificial Intelligence in Cancer Nanotheranostics

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Introduction

Artificial intelligence stands for the intellect of man-made machines which became possible through computer-based algorithms. The integration of various branches of science such as computer science, robotics, engineering, medicine, physiology, linguistics, and psychology resulted in the development of this novel branch of science. The era of artificial intelligence came into glare of publicity by continuous research across the world, and currently it is used as a common name for machine-based algorithms that are being used in various fields. AI can make rapid and accurate decisions similar to the human brain to overcome various hitches faced in diagnosis and therapy of several diseases (Lo et al., 2017).

Even though the algorithms of artificial intelligence were designed to overcome the challenges of industrial applications like maintenance of aseptic conditions, labeling of products, and packaging, now it is widely utilized to predict the severity of diseases, to make decisions related to dose optimization, and to manage surgical procedures especially in clinical oncology (Shiraishi & Moore, 2016; McIntosh et al., 2017). The prevalence and death rate caused by cancer is continuously increasing owing to lifestyle changeover and usage of harmful chemicals for

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