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A comparison between biopharmaceuticals and pharmaceuticals in cancer treatment

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Undoubtedly, cancer is one of the main causes of morbidity and mortality around the world. Common treatments of cancer such as surgery, radiotherapy and chemotherapy are effective in curing cancer at early disease stages; however, they cannot completely eradicate it in metastatic condition. For example, the success of chemotherapy has been diminished due to loss of its selectivity and specificity, thereby the administration of dose to patients should be limited because of the toxicity to normal cells. Thus, utilizing targeted anticancer biopharmaceuticals (monoclonal antibodies, non-antibody proteins and small molecules) can be effective in controlling the progression of cancer, having less side effects and survival of cancerous patients. Biopharmaceuticals are macro molecules-based therapeutic drugs which are manufactured in or extracted from biological sources. They are 200-1000 times larger than traditional small molecule drugs. Furthermore, they do not arise from simple chemical processes like traditional pharmaceuticals. So, it makes much greater complexity in their structure than the latter. On the other hand, pharmaceuticals, known as medicine or drug, are a principal component of traditional medicine and include a broad spectrum of medicines. They come from chemicals. In fact, they make up over 90% of the drugs on the market. Biopharmaceuticals and pharmaceuticals differ not only in terms of size, but also in the methods of processing, behavior and type of action in the body and so on. In this paper, features of biopharmaceuticals and pharmaceuticals for the treatment of cancer are explained and compared. These items include safety and efficacy (immunogenic response), bioactivity, side effects, cost, dosage rate and access rate. Having knowledge about effective pharmaceutical methods for the treatment of cancer can be very helpful in choosing an efficient method and its results can be more productive and accurate than conventional methods of cancer treatment.

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