Phytochemicals in Anticancer Drug Development: A Green Approach

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ABSTRACT

Cancer is one of the dreaded diseases that poses a great risk to human life and is still a tough challenge to modern medicines. There are various chemotherapeutic agents that are already in use but their low success has led to increased interests in the development of new anticancer compounds. Therefore, plant derived natural products, also called phytochemicals, have played important role in the management, prevention and treatment of cancer. Scientific evidences indicate that phytochemicals have significant antitumor potential thus are emerging as a rich source of effective yet safer agents against cancer. Phytochemicals contribute to approximately 50% of anticancer drugs prevalent currently, however reluctance of pharmaceutical industries towards plant based components is causing a significant shift of focus from plants to synthetic chemistry on drug development. A number of plant- derived compounds such as taxol, vincristine, vinblastine, topotecan, colchicine, podophyllotoxin and many more have been used successfully as anticancer drugs. Phytochemicals are suitable candidates for anticancer drug development due to their pleiotropic actions on target events with multiple effects and capability to block or retard the growth of cancer cells without any side effect. The exploration of plant kingdom may provide new leads for development of novel anticancer drugs and along with advancements in knowledge and technology involving in-silico approaches, the drug discovery and development process can be accelerated.

Keywords: Phytochemicals, anticancer, lead compounds, drug development, in silico

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