



Natural Products and their Attributes in Oncology Area: Hope on the Horizon?

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Editorial

Cancer is the general name of a heterogeneous group of more than 100 diseases. It arises from dysregulation in normal cellular mechanisms; and it is characterized by alterations in the expression of multiple genes, leading to local tissue invasion, which may eventually turn into metastasis. During carcinogenesis, cells undergo a multistep process to acquire specific characteristics that can promote cancer development, including these six essential hallmarks: sustaining proliferative signaling, evading growth suppressors, evading programmed cell death (apoptosis), enabling replicative immortality, inducing angiogenesis, and activating invasion and metastasis. These six key features of cancer have been recently revised to add two more hallmarks: the ability to reprogram cell metabolism to generate adequate energy, and the ability to avoid immune destruction. Malignant growths are also believed to acquire additional characteristics which enable them to promote inflammation, and genome instability [1]. We are pleased to introduce the (Clinics in Oncology) journal with eminent reviewers and editors in the field of cancer biology, discussing new approaches in molecular cancer therapeutics. In this issue, we hope to bring your articles offering unique insights on the breakthroughs and challenges in understanding the impact of natural products on developing new anticancer agents. There is some truth to the old adage that the therapeutic use of natural products and their derivatives is as old as the human race. The ancient civilizations provided written evidences for the use of natural sources to treat various illnesses. According to the World Health Organization (WHO), about 80 % of population in the developing countries relies on traditional herbal medicine for primary health care needs. Recently, a wide range of plant-derived phytochemical components and their synthetic derivatives have been suggested for cancer treatment. Moreover, it has been estimated that 25 %-48 % of the currently approved therapies by the Food and Drug Administration (FDA) are derived from plants. The Dictionary of Natural product has listed about 200,000 plant secondary metabolites with abroad spectrum of biodiversity and high degree of stereochemistry. However, it is estimated that only 0.5% of the medicinal plants have been chemically thus far, leaving an abundant source for further examination [2]. Although, there are many therapeutic approaches to treating cancer, results are not fully satisfactory because the cytotoxicity of chemotherapy to solid tumors is nonspecific. Besides, selective anticancer drugs are lacking and some recurring tumors can become resistant to drugs. The capacity of a chemotherapeutic agent to target malignant cells while preserving normal cells is the hallmark of a promising cancer drug. Thus, the discovery of really effective anticancer drugs is a very important and highly challenging mission. Most recently, our research team in EMAN testing and research laboratory- USM- Malaysia and CAS in Oman had the opportunity to work on several plant extracts, pure compounds and synthetic molecules towards different cancer cells, and what we found is that many natural products have the ability to target cancer cells selectively via different mechanism. For example, β -caryophyllene is one of the major terpene found in enormous essential oils plant. It seems to possess strong inhibitory activity against colorectal tumor growth through a mechanism that appears to involve apoptosis induction and angiogenesis suppression [3]. Taken together the mutli-functional properties of β -caryophyllene which includes anticancer, antimicrobial, antioxidant and anti-inflammatory activities suggest that such molecule/s may interact with several components of tumor pathway [4]. With the potential benefits of natural products, we hope to be able to discover and publish new compounds that may be therapeutically useful against carcinogenesis. This article issue does not aim for a comprehensive coverage of the wide and complex field of natural products. Ruther, we hope to stimulate our readership with a number of papers highlighting emerging discoveries in the area of research, and to spot our commitment to covering hot and promising topics.

Clinics in Oncology aims to be a forum for research and review articles that employ robust models and provide mechanistic insights on the field of oncology. We are highly acknowledging

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the validation data of key findings using *in vivo* model and molecular imaging. We hope that the scope highlighted here underscore our commitment to publishing strong articles. Finally, we sincerely thank our authors, editors and reviewers for their contribution, and hope you enjoy these papers.

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