

Editorial:

ANTICANCER COMPOUNDS FROM PLANTS

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Cancer is a leading cause of death all over the world and represents a major public health burden. Natural plant products have been historically used for the treatment of various diseases. The earnest search for plant-derived anticancer agents began in the 1950s with the discovery and development of the vinca alkaloids—vinblastine and vincristine, and with the isolation of the cytotoxic podophyllotoxins (Cragg and Newman, 2005). A good number of the current-day commercially approved anticancer drugs as well as the natural product-derived compounds in various stages of clinical development as anticancer agents originate from plants. Natural products still serve as an excellent source for the discovery and development of modern drugs for cancer treatment. The present work reviews the most recent information in the field of natural anticancer substances, and in this regard we have summarized the key information published in 2012 on plant derived anticancer compounds (Table 1).

Table 1: Recent studies on anticancer compounds from plants

Key message	Reference
This article provides an overview of natural products with pro-oxidant and anticancer activities, with a special focus on plant secondary metabolites, and discusses their possible use as cancer chemotherapeutic agents.	Martín-Co et al., 2012
Noscapine, an antitumor alkaloid obtained from opium poppy, bound to tubulin, arrested metaphase, and induced apoptosis in dividing human cells.	Winzer et al., 2012
Preclinical evidence suggests that plant phytoalexins possess anticancer properties.	Romagnolo et al., 2012
Sulforaphane, a compound derived from cruciferous plants displayed anticancer properties in human prostate cancer cell lines and in xenograft animal models.	Wiczek et al., 2012
Luteolin inhibited hypoxia-induced epithelial mesenchymal transition in cultured human non-small cell lung cancer cells.	Ruan et al., 2012
Secondary metabolites of plants, such as alkaloids, phenolics, and terpenoids reversed drug resistance in cancer cells and microbes by interfering with ATP-binding cassette transporters.	Wink et al., 2012
Betulinic acid killed melanoma, leukemia, lung, colon, breast, prostate and ovarian cancer cells via induction of apoptosis.	Liu and Luo, 2012
Lunasin, a peptide derived from the soybean 2S albumin seed protein, demonstrated both anticancer and anti-inflammatory activity.	Seber et al., 2012
Plumbagin, a constituent of species of the plant genera <i>Drosera</i> and <i>Plumbago</i> , displayed antineoplastic activity toward various cancers.	Kawiak et al., 2012

Table 1 (cont.): Recent studies on anticancer compounds from plants

Key message	Reference
Gallic acid–based steroidal phenstatin analogues exhibited significant anticancer activity against breast cancer cell lines by through inhibiting tubulin polymerization.	Parihar et al., 2012
Cryptotanshinone induced caspase-independent cell death in human tumor cells.	Chen et al., 2012
Ursolic acid exhibited potent anticancer activity against many types of cancer cells. It elicited strong antitumor effects via upregulation of the PTEN gene and inhibition of the PI3K/Akt pathway.	Wu et al., 2012
Coumarins and its derivatives with potent in vitro/in vivo biological activity were implicated as promising anticancer compounds.	Kontogiorgis et al., 2012
Recent advances in the discovery and evaluation of ginsenosides as anticancer agents support further pre-clinical and clinical development of these agents for the treatment of primary and metastatic tumors.	Nag et al., 2012
Withanolides, a large group of steroidal lactones found in Solanaceae plants, exhibited potential anticancer activity.	Wang et al., 2012
Weekly administration of paclitaxel-carboplatin had limited clinical benefit in the treatment of vulvar squamous cell carcinoma.	Han et al., 2012
Carnosic acid, the main antioxidant compound of <i>Rosmarinus officinalis</i> L., inhibited the proliferation and migration capacity of human colorectal cancer cells.	Barni et al., 2012
Pomolic acid used as an anti-cancer agent in the treatment of breast cancer, modulated AMP-activated protein kinase pathways.	Youn et al., 2012
The development of leads from 1,4-naphthoquinones obtained from <i>Diospyros</i> L. are growing dramatically, especially in anticancer and antibacterial investigations.	Nematollahi et al., 2012
4-Shogaol, an active constituent of dietary ginger, may be a novel anticancer agent for the treatment of metastasis in breast cancer.	Hsu et al., 2012
Sanguinarine, a benzophenanthridine alkaloid, induced apoptosis in HT-29 human colon cancer cells and may have a potential therapeutic use in the treatment of human colon cancer.	Lee et al., 2012
The ability of α -mangostin, a xanthone from the mangosteen fruit, to inhibit prostate cancer in vitro and in vivo suggested that it may be a novel agent for the management of prostate cancer.	Johnson et al., 2012
Magnolol is a promising natural compound for the treatment of gastric cancer and may be a potential candidate for in vivo studies of monotherapies or combination antitumor therapies.	Rasul et al., 2012

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