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Advances in Plant-Sourced Natural Compounds as Anticancer Agents

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Cancer remains one of the leading causes of death worldwide, particularly in countries with higher life expectancy, education levels, and standards of living, despite significant advances in early detection and treatment over recent decades. As a result, there is growing interest in exploring alternative and complementary strategies, such as the use of natural compounds as adjuvant therapies, to improve patient outcomes.

The plant world has emerged as a rich source of bioactive molecules for the discovery and development of new anticancer drugs. Several plant metabolites have served as lead structures for the development of FDA-approved chemotherapeutics. Research into medicinal plants continues to grow because novel therapeutics derived from them offer the promise of more effective, less toxic treatment options for patients, particularly when conventional therapies are limited by resistance or intolerable side effects. Plant extracts and isolated phytochemicals have demonstrated strong potential to improve the clinical outcomes of cancer patients, as evidenced by a growing body of preclinical and clinical research. In addition to direct cytotoxic effects, many phytochemicals modulate key signaling pathways involved in tumor growth, metastasis, and immune evasion. They may enhance the sensitivity of cancer cells to existing treatments.

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