

A Review Article On : Herbal Anticancer Drug

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ABSTRACT

The review highlights the significant role of plant-derived compounds in the treatment of cancer, which is the second leading cause of death worldwide. These compounds, extracted from various medicinal plants, have been utilized for their therapeutic properties against cancer. The review discusses notable lead molecules such as Vincristine, Paclitaxel, and Resveratrol, among others, and their effectiveness in combating cancer and managing chemotherapeutic side effects. Overall, it emphasizes the longstanding utilization of medicinal plants as a valuable resource in the development of cancer treatments.

I. INTRODUCTION

In recent times, medicinal plants have gained significant attention as valuable sources for drug discovery, regardless of their classification as herbs, shrubs, or trees. These plants have played a crucial role in treating various diseases, including cancer, with the World Health Organization estimating that 80% of people in rural areas rely on medicinal plants for primary healthcare. This reliance is based on traditional knowledge of their medicinal properties.

Natural products derived from plants are increasingly being explored to develop effective drugs with enhanced anticancer activities. Understanding the intricate synergistic interactions among the constituents of anticancer herbs is essential for formulating designs that can target cancerous cells while sparing normal cells.

This approach holds promise for developing safer and more efficient cancer treatments.

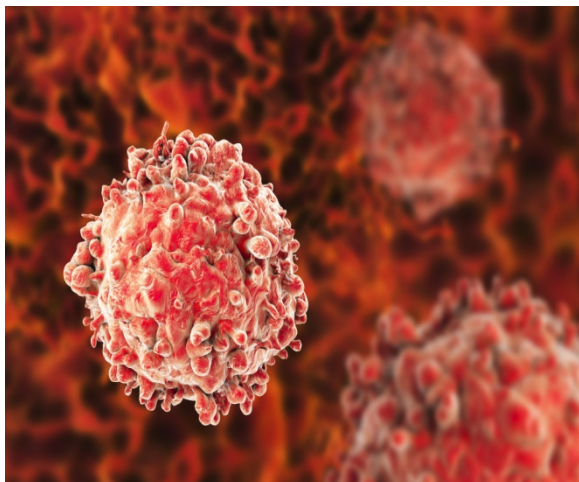
It's fascinating how India's rich biodiversity contributes to medicinal plant discoveries, especially in cancer research. Natural compounds like those from *Podophyllum peltatum* and other plants offer promising leads for new treatments. The intersection of science, mathematics, and technology enables researchers to explore these possibilities further, bridging disciplines for innovative solutions.

The passage highlights how scientific concepts can be easily expressed as ideas, and how numbers and standard mathematical symbols like "n" are universally understood. It emphasizes the prevalence of mathematical tools and applications, enabling the use of equations in various contexts.

LEUKEMIA

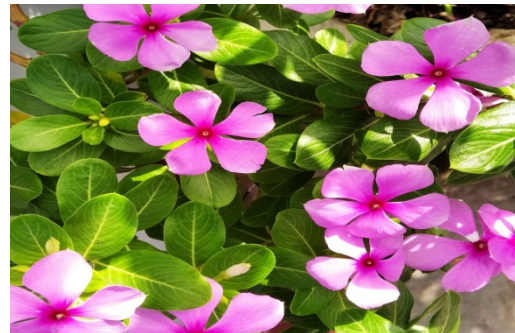
Leukemia, a group of cancers originating from blood-forming tissues, includes drugs like Vincristine, Vinblastine, Homoharringtonine, and Honokiol. The term "leukemia" originates from the Greek word "leukos," meaning "white blood." Leukemia is typically classified into four main types.

Leukemia comes in four main types: acute lymphocytic leukemia (ALL), acute myeloid leukemia (AML), chronic lymphocytic leukemia (CLL), and chronic myelogenous leukemia (CML), each based on cell type and growth rate. Vincristine works by binding to a protein called tubulin, preventing cell division, while Vinblastine affects microtubule dynamics. Homoharringtonine blocks protein synthesis, and Honokiol inhibits certain cellular pathways. These drugs are available in various formulations for treatment.



Marketed preparation

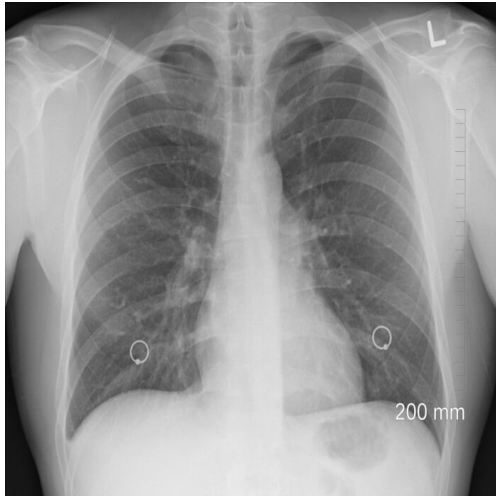
1. Vincristine sulph 1mg, methyl paraben 0.13%, propyl paraben 0.02%.
2. Vinblastine sulph. 1mg, sodium chloride 9mg benzyl alcohol 0.9%v/v/ml.
3. Omacetaxine synribo: 1.25 mg/m² administered by subcutaneous injection twice daily for 7 consecutive days of a 28-day cycle. 5 mg/m² for seven days, 7 mg/m² for seven days, and 5 mg/m² for nine days.
4. Honokiol90 : 60-330 mg for a 150lb person 220-440 mg for a 200lb person 270-550 mg for a 250lb person.



Lung cancer

Lung cancer treatments include Paclitaxel, Topotecan, Maytansine, and Astragalus. Lung cancer begins with abnormal cell growth in the lungs, forming tumors that can spread. There are two main types: small cell lung cancer and non-small cell lung cancer. Paclitaxel stabilizes microtubules, Topotecan prevents DNA repair, Maytansine inhibits microtubule assembly,

and Astragalus boosts immune response and reduces free radical production. These drugs target different aspects of cancer growth and function.



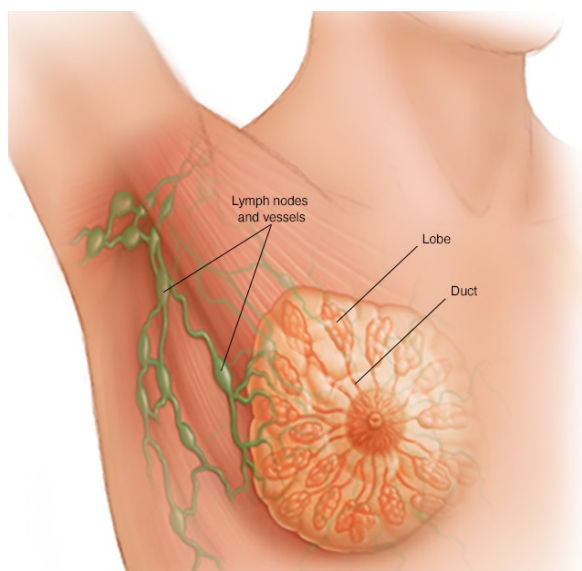
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1. Paclitaxel is available in 30 mg (5 mL), 100 mg (16.7 mL), and 300 mg (50 mL) multidose vials.
2. Topotecan Injection 1.5 mg/m² by intravenous infusion over 30 minutes daily on days 1 to 5 of each 21-day cycle.



Breast cancer

Breast cancer is a type of malignant tumor that originates in the cells of the breast, most commonly adenocarcinoma. Various drugs like Docetaxel, Ellipticine, Lapachol, and Oleanolic acid are used in therapy. Docetaxel disrupts the microtubular network in cells, Ellipticine intercalates into DNA and inhibits topoisomerase II, Lapachol inhibits DNA replication and RNA synthesis, and Oleanolic acid activates the AMP-activated protein kinase pathway, inducing metabolic adaptation in cancer cells.



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Marketed preparation

1. Injection containing 20 or 80 mg of docetaxel per 1.0 Or 4.0mL, respectively, in 50/50 (v/v) polysorbate 80/ethanol (anhydrous).
2. Ellipticine-polyvinylpyrrolidone was compared with that of the hydrochloride salt and ellipticine in suspension following oral administration at 250 mg/kg²
3. Lapachol concentration levels (20, 40 or 60 mg/ mxzL).
4. Treated with various concentrations of oleanolic acid (0, 5, 25, 50 μM) for 72 h.

Skin cancer

Skin cancer comes in two main types: malignant melanoma, the more serious form originating from melanocytes, and non-melanoma skin cancer (NMSC), typically less threatening and derived

from keratinocytes. Cisplatin works by binding to DNA, disrupting its structure and replication. Etoposide interferes with DNA repair, causing breaks in DNA strands, particularly effective in rapidly dividing cancer cells. Thymoquinone induces apoptosis in acute lymphoblastic leukemia cells via mitochondrial pathways.

Marketed preparation

1. Cisplatin 70 mg/m² (days 1, 8, 15, 29, 36, 43) in combination with escalating doses of paclitaxel.
2. Etoposide daily administration of 100 mg/m² for 4 to 5 days.
3. Thymoquinone: 20, 30 and 40 mg/kg body weight for intraperitoneal injection and 200, 300 and 500 mg/kg body weight for oral ingestion.

II. CONCLUSION

Cancer is a significant global health concern, being the second leading cause of death after cardiovascular disease. Plant-derived compounds have been crucial in developing effective anti-cancer agents. Medicinal plants and their isolated molecules are increasingly being explored as alternative treatments for cancer. Chemical compounds like vincristine, vinblastine, paclitaxel, cisplatin, and resveratrol, sourced from various plants, are utilized to both treat cancer and manage chemotherapy side effects. This review examines the therapeutic potential of plants in cancer treatment.

