DRUG PROFILE
01. Structure

02. Molecular Formula: \( \text{C}_{47}\text{H}_{51}\text{NO}_{14} \)

03. Molecular Weight: 853.9 g/mol

04. Chemical Name:

\[
\text{6,12b–bis(acetyloxy)–12–(benzoyloxy)–2a,3,4,4a,5,6,9,10,11,12,12a,12b–dodecahydro–4,11–dihydroxy–4a,8,13,13–tetramethyl–5–oxo–7,11–methano–1H-cyclodeca-[3,4]benz[1,2-b]oxet–9–yl ester.}
\]

05. Category: Antineoplastic

06. Description: White to off–white crystalline powder

07. Solubility: Freely soluble in methanol and Acetonitrile,

Practically insoluble in water.
09. Dissociation Constant : 11.99
10. Partition Coefficient : Experimental LogP/Hydrophobicity is 3.54
11. Melting Point : 213-216 °C

4.2.2 PHARMACOLOGY

A. Mechanism of Action
Paclitaxel interferes with the normal function of microtubule growth. Whereas drugs like colchicine cause the depolymerization of microtubules in vivo, paclitaxel arrests their function by having the opposite effect; it hyper-stabilizes their structure. This destroys the cell's ability to use its cytoskeleton in a flexible manner. Specifically, paclitaxel binds to the β subunit of tubulin. Tubulin is the "building block" of microtubules, and the binding of paclitaxel locks these building blocks in place. The resulting microtubule/paclitaxel complex does not have the ability to disassemble. This adversely affects cell function because the shortening and lengthening of microtubules (termed dynamic instability) is necessary for their function as a transportation highway for the cell. Chromosomes, for example, rely upon this property of microtubules during mitosis. Further research has indicated that paclitaxel induces programmed cell death (apoptosis) in cancer cells by binding to an apoptosis stopping protein called Bcl-2 (B-cell leukemia 2) and thus arresting its function.

B. Therapeutic Indications
Used in the treatment of Kaposi's sarcoma and cancer of the lung, ovarian, and breast.

C. Protein Binding
89%-98%

D. Half life - The active metabolite has an elimination half-life of about 5.8 hours
E. Marketed Products (Brand Names)

- Abraxane
- Epitaxol
- Onxol
- Pacxeed
- Paxene