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Plant cell culture technology: An effective biotechnology tool for taxol and related taxanes production**Samavia Mubeen, Chun-Tao He and Zhong-Yi Yang**

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Taxol, also known as paclitaxel is a most promising chemotherapeutic agent against numerous cancers including ovarian, breast and lungs cancers. This biologically active compound was initially isolated from the inner bark of *Taxus brevifolia* (Pacific yew). The demand for taxol supply was greatly exceeded due to the accumulation of taxol at very low concentration, slow growth of tree and high cost of extraction. Due to these reasons, searches for alternative sources were made including the screening of plants other than *Taxus*, chemical synthesis, semi-synthesis of taxol by conversion of baccatin III (BAC III) or 10-deacetyl baccatin III (10-DAB III) and microbial fermentation. Neither of these sources was viable at industrial level due to the high cost of production, lengthy steps, low production and difficulty in the extraction process. Plant cell culture is an attractive biotechnological strategy to secure sustainable and economical production of taxol and related taxane at the industrial level. Different strategies such as cell line selection, growth condition optimization, physical parameters, elicitation, extraction and scale-up to bioreactor have been extensively investigated to improve the production of taxol. This review will shed light on recent advances in *Taxus* cell culture technology, focusing on optimizing strategies to improve taxol and related taxoid production in cell culture system. We will also summarize the progress towards the problem associated with the production of taxol by cell culture technology at the commercial level and will also highlight the recent success.

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