Plant Cell and Tissue Cultures as a Source of Biological Active Substances

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Since the synthesis of most biologically active compounds is very complicated ones could be separated from plants. Biosynthesis using plant cells and tissue cultures is the main alternative pathway, which allows to industrialize the synthesis of biological products. The biotechnological production is very expensive so as only a few examples of such substances are known. Therefore, only expensive substances might be produced from isolated cells and tissue.

Biotechnological production of dimeric indol alkaloids of *Catharanthus roseus* satisfies these conditions. A high productivity callus culture of *Catharanthus roseus L.* was obtained. HPLC analysis shows high vincristine content (316 mkg/g in the dry mass). Apparently, high level of photosynthesis and the specific structure of the callus (presence a somatic embryoides) provide high level of vincristine production. Cultivation was carried out using the Murashige and Skoog medium with the addition of α-NAA and 6-BAA in the flasks with the polyurethane disks.

Also the influence of fungal elicitors on the yield of dimeric indol alkaloids was investigated. The treatment of callus cells by 0.2 % *Aspergillus niger* extract increases the vincristine yield in tissues by 5.5 times. Thus controlling of biosynthesis of biologically active compounds by manipulation of epigenetic factors (chemicals factors, method of cultivation, elicitors) can increase noticeably the yield of secondary products *in vitro*.