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**“Pilot-scale Bioreactors Technology: A Novel Tool for Enhanced Plant
Biofactories Production of Functional Therapeutic and Nutraceutical
Phytomolecules”**

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ABSTRACT

Panax ginseng C. A. Meyer (Araliaceae) and *Corylus avellana* L. (Betulaceae), are important valued Pharmaceutical and Nutraceutical plants in Asia, Europe and American Countries. In Chinese, the word ginseng is directly translated as the essence of man, which literally means "man-herb". The present study was performed to develop without foreign gene, using biogenetic precursors and elicitors to manipulate metabolic biofactories of dammarane triterpene glycosides for ginsenosides production in ginseng adventitious roots from pilot-scale bioreactors (10,000 Liters) and vitamin for α -tocopherol production from hazelnut cells culture. We have screened several functional Nutraceutical and therapeutic phytomolecules (antioxidant and anticancer) from bioreactors derived ginseng biofactories. In comparison, feeding biogenetic precursors deduced ginsenosides of protopanaxatriol showed the highest production than protopanaxadiol. The achievements of this technology allow prediction of biofactories mechanisms and provide a natural *in vitro* products within which the different scales and approaches of functional food and human therapeutics. Furthermore, this technology could be a new avenue for Agric-biotech sectors.