



Nripendranath Mandal

Bose Institute, Kolkata, India

Drug development from natural resources: an insectivorous plant, *Drosera burmannii*, is a source of better medicine to combat breast cancer by altering tumor-microenvironment

The routine conventional therapy can not differentiate between the malignant and normal cells. Due to this problem, purified chemical drug therapy i.e., Chemotherapy often manifests into harmful side effects in patient's body. Drug resistance, in some cases, is also another major problem. Thus, it is still a challenge for scientific community to develop new therapies focusing on cancer cell and its microenvironment including inflammation, while avoiding the detrimental side effects of conventional therapies involving synthetic drugs. We have explored various natural resources including medicinal plants, algae and lichens for their potent antioxidative and free radical scavenging efficacies, among which eleven resources have shown *in vitro* anticancer effects in various cancer cell lines by inducing apoptosis and/or regulation of cell cycle, while being nontoxic to the normal cells. For the first time, Sundew plant, *Drosera burmannii* an insectivorous plant have been investigated for *in vitro* anticancer and anti-inflammatory activity. 70% methanolic extract of *D. burmannii* (DBME) selectively inhibited the proliferation of breast cancer (MCF-7) cells without affecting the viability of other malignant and non-malignant cells. DBME induced G2/M phase arrest and apoptosis in MCF-7 cells by suppressing the expression of cyclin A1, cyclin B1 and Cdk-1; and increasing the expression of p53, Bax/Bcl-2 ratio leading to activation of caspases

and PARP degradation, hence, activating both the pathways of apoptosis. DBME also down regulated LPS-induced increased expression of iNOS, COX-2 and TNF- α along with suppression of intracellular ROS production which confirms the potential of DBME as anti-inflammatory extract. DBME also showed excellent ROS and RNS scavenging along with iron chelation and DNA protection activity. GCMS and HPLC analysis of DBME revealed the presence of several bioactive phytochemicals. Hence, *D. burmannii* can be considered as a useful source for the discovery of new drug leads against breast cancer.

Biography

Nripendranath Mandal has completed his PhD in the year of 1990 from University of Calcutta and Postdoctoral studies from MIT, NCSU and SLUHSC, USA since 1989-1996. He is the Professor in the Division of Molecular Medicine, Bose Institute, a premier research institute founded by Sir J C Bose, Calcutta, India. He has published 142 papers in reputed journals, patents from seven countries, book chapters, News Media, etc., and serving as reviewer for various renowned journals. He has been elected Fellow of SERS, Meerut, 2015 and FZS, Kolkata, 2014 and also received various awards and recognition for his marvellous research output.

mandaln@rediffmail.com