Index No. 98/19/Life Sc./26 **Abstract**

Title: Pathophysiological alterations in experimentally induced leukemic bone marrow and therapeutic immune-modulation by *Eclipta alba* involving NF-kB signaling

The increase in civilization and mankind is a reason for the growing industrialization and hence portrays to be a leading source of many carcinogenic chemicals to the environment. N-nitroso compounds (NOCs) are such carcinogens that are widespread in our environment through various food products, tobacco, pesticides, and rubber making factories, etc. In our study, we have used one such NOC called N-N' ethylnitrosourea (ENU) to induce leukemia in the Swiss albino mice model. Leukemia is a heterogeneous malignancy of the blood, and it is highly prevalent in young adults and teens. Although, there has been enormous advancement in leukemic chemotherapy to date, there are still many toxic side effects. Hence, the exploration for natural anti-cancer products from Mother Nature is ongoing in the scientific community, as it is readily available, less toxic and, economical.

In this research, we have explored the anti-leukemic effects of the age-old Ayurvedic herb *Eclipta alba* and its isolated active compound wedelolactone on the bone marrow cells of ENU-induced leukemic mice. The underlying anti-inflammatory mechanism of the herbal extract and wedelolactone via the down-regulation of NF-kB signaling pathway, inhibition of COX-2 activation, and suppression of the NLRP3 inflammasome in the bone marrow cells of leukemia has been reported in this research. Furthermore, *Eclipta alba* and wedelolactone showed pro-apoptotic effects via the mitochondria-mediated cytochrome c pathway and hence portrayed its anti-proliferative role on the bone marrow of ENU-induced leukemia.

Taken together, it can be concluded that even though both *Eclipta alba* and wedelolactone individually can be considered as potential candidates, for anti-leukemic research but in comparison the herbal extract containing a concoction of many bioactive compounds, portrays better ameliorating properties as compared to the active compound treatment alone.

Mitadas 29/05/2023

Signature of Supervisor (With seal & date)

Dr. Sujata Law, Ph D
Assistant Professor
Dept. of Biochemistry & Medical Biotechnology
Calcutta School of Tropical Medicine
C.R. Avenue Kolkata 700 073

Subhashree Bhattacharyya 29.05.23

Signature of Candidate