

Assessing the Effect of Benzene on Hematopoiesis Using *Drosophila* Model System

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Hematopoietic Stem Cells (HSCs) are responsible for the generation of all blood cell types during all life. Due to the enormous rate of blood cell production, hematopoiesis is sensitive to local and systemic stress. Deregulation of the hematopoietic differentiation program is at the origin of numerous pathologies including leukemia. In adult mammals, hematopoiesis takes place in the bone marrow. In *Drosophila* larvae hematopoiesis takes place in a specialized organ called the lymph gland (LG). The LG is composed of three zones: (1) the medullary zone (MZ) that contains the hematopoietic progenitors called pro-hemocytes (2) the cortical zone (CZ) containing the differentiated hemocytes and (3) the Posterior Signaling Center (PSC) that acts as a niche to regulate the hematopoietic response to immune stress such as wasp parasitism.

As a result of agricultural and industrial developments, the distribution of chemicals in the environment poses a serious risk to human health including hematopoietic malignancies. Benzene, a monocyclic aromatic hydrocarbon, is used in many industrial and household products. Prolonged exposure of benzene has shown many serious health issues at both occupational and non-occupational levels in humans. In this study, we investigate the effects of benzene on hematopoiesis using *Drosophila* LG as a model. Benzene exposure to *Drosophila* larvae resulted in a dose dependent effect on blood cell production, activation of the immune response, premature bursting of LG and an increase in Reactive Oxygen Species (ROS) levels in LG. Besides, we observed that PSC plays an important role in benzene induced hematopoietic disturbance. Our results provide a new insight into understanding the process of benzene induced hematopoietic perturbations using *Drosophila* LG as a model system.

Biography:

Mr. Leonard Clinton D'Souza is a Doctoral Research Fellow at Division of Environmental Health and Toxicology, Nitte University Centre for Science Education and Research, Nitte (Deemed to be University) situated in a beautiful city of Mangalore, India. He has completed his graduation (Biology-2013) and his post-graduation (Biochemistry-2015) from Mangalore University. Before eventually joining for a doctoral research at Nitte (Deemed to be University), he worked as a research fellow for two years at SDM College of Medical Sciences, Dharwad, India. His research areas include biochemistry, cancer biology, toxicology, developmental biology and immunology. He has also co-authored two research articles and also two book chapters. He is currently working on the effects of environmental toxicants in hematopoiesis using *Drosophila* as a model system.