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## Alterations of hematopoietic stem cells and associated marrow microenvironment in experimentally induced leukemia and Aplastic anaemia: An inverse correlation

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Bone marrow (BM) is the ultimate machinery of hematopoiesis in the adult vertebrate system physiology and is the residential lap of hematopoietic stem and stromal cell. The cytotokines of bone marrow Hematopoietic Stem Cells (HSC) are controlled by various regulatory factors like cytokines, growth factors, nourishing factors and many other signaling molecules to help cell survival, differentiation, proliferation, and apoptosis in health which, suggestively, suffers deregulation in diseased states. HSC maintains hematopoiesis and homeostasis by contracting and expanding the pool of hematopoietic cells in the bone marrow where they can be identified phenotypically as Sca1+ and c-kit+ cells. Failure to maintain such functional efficacy by HSC in the Bone Marrow may produce Aplastic Anemia. On the contrary, a deregulated differentiation and hyper-regulated proliferation of HSC may be held responsible for leukemia induction in individuals. Indeed, HSCs and haematopoietic progenitor cells (HPCs) are vulnerable targets for such disease oriented dysregulation which bears close correlation with the bone marrow microenvironmental damage. In our experimental set up, we induced aplastic anemia by injecting busulfan and cyclophosphamide and leukemia by N-N' ethylnitrosourea intraperitoneally in inbred swiss albino mice. The present study aims at evaluating the possible mechanism(s) of deregulation in the bone marrow physiology with special reference to marrow stem and stromal cell surface receptor expression, cellular granularity, cell cycle status and overall marrow architecture. We also presented the results of studying long term marrow culture, marrow adherent and hematopoietic progenitor cell colony formation, STAT and other signaling proteins expression and apoptosis mechanism involved in aplastic anemia and leukemia. The investigations revealed an interesting correlation between disease initiation, progression and specific marrow microenvironmental components association with HSC in the BM microenvironment with particular reference to leukemia and aplastic anemia which present an inverse scenario between each other.

### Biography

Dr. Sujata Law did her Ph.D on Stem Cell Biology from the University of Calcutta and postdoctoral studies in the field of Signal Transduction from Bose Institute, Kolkata. She is Assistant Professor (Stem Cell Biology) in the Department of Biochemistry & Medical Biotechnology at Calcutta School of Tropical Medicine, Kolkata, India. She has published more than 28 Original Articles and Reviews in reputed journals.