

Cyclophosphamide is an alkylating agent developed in the 1960s for the use in treatment of cancerous diseases. Since its introduction, it has manifested various spectra of effects. Of uttermost importance are the impacts cyclophosphamide has on the hematopoietic system housed in the bone marrow of femoral and other bones. Hematopoiesis is a complex process which has been extensively studied for decades. The more it is known about the niches the hematopoietic stem cells occupy as well as of their life cycle, the more it is possible to design functional therapy for its malignancies and improve the survival rates. The effects of cyclophosphamide administration on hematopoietic system are divided into three major categories: myeloablation and myelosuppression, immunosuppression, and mobilisation of hematopoietic stem cells into the peripheral blood. The immunosuppression is achieved by systematic depletion of progenitors differentiating into leucocytes. Induced neutropenia and lymphopenia allow for management of autoimmune diseases and preservation of transplants. Mobilisation, a process opposite to stem cell homing, seems to be dependent on disruption of cellular adhesion (CXCR4/SDF-1, VCAM-1/VLA-4) facilitated by proteases released into the environment after cyclophosphamide exposure.