Various oncogenes are associated with deregulation in cell proliferation, apoptosis and cell survival, leading to cancer. Aberrant activation of PI3K-AKT signaling is known modulator of cancerous growth. Overproduction of ROS in tumor microenvironment due to higher metabolic activity is further increased owing to oncogenic signaling pathways. Oxidative stress is a major contributor of cancer development, upregulates expression of oncogenic signaling; down regulates apoptosis as well as induces inflammation and angiogenesis. Targeting deregulated signaling pathways in cancer should regulate cellular processes like cell proliferation, survival or angiogenesis towards prevention of carcinogenesis. Present study was aimed to analyze oncogenic signaling pathway and its correlation with ROS production, cell survival, apoptosis, angiogenesis and energy metabolism during lymphoma growth in mice. Further, the study reveals anticarcinogenic role of quercetin (QUE) in Non-Hodgkin’s T-cell lymphoma (Dalton’s Lymphoma-DL) bearing mice. Accumulation of ascite fluid in peritoneum of mice is a hallmark of lymphoma growth. Therefore, ascite cells were used for experimental purpose to study the effect of QUE in prevention of cancer progression.