Diets have traditionally been considered the major source of metabolic micronutrients which could play in an interactive way to prevent the degenerative diseases including cancer. The number of socio economic individuals has increased and with it increasingly complex problems of bringing prevention and early treatments. Cancer increasingly affects all types of cells and does so in increasingly diverse fashion. This might play an important role in modifying gene expression, antioxidant status and cancer risk in humans. This thesis attempted evidence that would characterize the association of various surrogate end points and precise quantifications of the magnitude in host disease relationship. The crux of the work embedded in this thesis relates various biochemical, pathological and molecular approaches in defining the role of selenium, an essential mineral and Vitamin D₃, a dietary nutrient in combination in their efficacy in combating the challenge imposed by a potent carcinogen like diethyl nitrosamine during the process of rat liver carcinogenesis. Thus the thesis work, if truly functional could have a major importance in alleviating the society against the killer disease like cancer.