From the above survey of literature it is evident that cadmium affects a large number of parameters spanning different organs, organelles and cells in various animal species as well as in man. In the present dissertation, an attempt has been made to examine in detail the effects of cadmium on human platelets and erythrocytes in vitro to gain a clearer understanding of the perturbations of various unit processes, such as functioning of antioxidant defence mechanism, uptake and release of $[^3\text{H}]$-5-HT by platelets, toxicokinetics of cadmium accumulation etc. The details of the plan of work is given below:

CHAPTER - I : Effects of cadmium treatment in vitro on the uptake and release of $[^3\text{H}]$-serotonin by human blood platelets

(a) Studies on the uptake of $[^3\text{H}]$-5-hydroxy tryptamine (5-HT) by human platelets in control and CdCl$_2$ treated conditions.

(b) The double reciprocal plot of $[^3\text{H}]$-5-HT uptake by blood platelets at different concentrations of 5-HT in control and CdCl$_2$ treated situation.

(c) Effects of cadmium on the thrombin-induced release of $[^3\text{H}]$-5-HT by platelets.

(d) Effects of the presence of equimolar calcium (1 mM) on the efficacy of $[^3\text{H}]$-5-HT uptake and release in the presence of cadmium.

CHAPTER - II : Effects of CdCl$_2$ treatment in vitro on platelet aggregation and release of granular constituents from three different platelet granules

(a) Studies on the thrombin-induced platelet aggreation using washed blood platelets under CdCl$_2$ treated conditions in vitro.

(b) Studies on the thrombin-induced release of platelet dense granular constituent as monitored by measuring the extent of release of pyrophosphate under CdCl$_2$ treatment in vitro.
(c) Studies on the thrombin-induced release of platelet lysosomal granule constituents as monitored by measuring the release of \( \beta \)-glucuronidase, \( \beta \)-glucosidase, \( \beta \)-galactosidase and aryl sulfatase under CdCl\(_2\) treatment \textit{in vitro}.

(d) Studies on the thrombin-induced release of platelet \( \alpha \)-granular constituents as monitored by measuring the extent of release of antithrombin factor or platelet factor 4 under CdCl\(_2\) treatment \textit{in vitro}.

(e) Uptake of cadmium by washed blood platelets \textit{in vitro}.

CHAPTER III: Effects of cadmium chloride treatment \textit{in vitro} on human blood platelets in relation to antioxidant defence system and activation characteristics.

(a) Studies on the glutathione linked antioxidant defence system such as, reduced glutathione, glutathione peroxidase, glutathione reductase, glutathione-S-transferase, glucose-6-phosphate dehydrogenase, catalase and externally added \( \text{H}_2\text{O}_2\) removing capacity in control and \textit{in vitro} CdCl\(_2\) treated platelets.

(b) Studies on the prostaglandin endoperoxide generation in control and CdCl\(_2\) treated platelets \textit{in vitro} by measuring their breakdown product, malondialdehyde, as an index for platelet activation.

CHAPTER IV: Effects of cadmium treatment \textit{in vitro} on certain functional parameters of human erythrocytes.

(a) Studies on the effects of CdCl\(_2\) treatment \textit{in vitro} on the activities of human erythrocyte membrane associated enzymes viz. p-nitrophenyl phosphatase, Mg\(^{2+}\)-ATPase, acetyl cholinesterase, \( \beta \)-glucosidase, \( \beta \)-glucuronidase, \( \beta \)-galactosidase and malondialdehyde formation under CdCl\(_2\) treatment \textit{in vitro}.
(b) Effects of CdCl₂ treatment \textit{in vitro} on the status of the antioxidant defence system of human erythrocytes were also investigated.

(c) Toxicokinetics of the uptake of cadmium \textit{in vitro} by human red blood cells.