SUMMARY

Iminodibenzyl and compounds related to it structurally and/or biologically were used in this study. Since these compounds form the most potent class of antidepressant drugs and are in clinical use for quite some time, compounds similar to these, well known drugs, were synthesized and tested for antidepressant, anxiolytic and analgesic activity. Three azetidine derivatives, \( A_1, A_2 \) and \( A_3 \) which were the gift of Dr. P. Meloni of Carlo Erba Research Institute, Italy were also similarly studied.

These studies were divided into two parts. The first part consisted of synthesis of pyrimidine compounds and their structure determination. (These compounds were synthesized by condensing 2-Aminopyrimidine with an amine in presence of formaldehyde. On refluxing the reaction mixture, the cyclized product was obtained. The structure of these compounds was established using NMR spectroscopic methods.) In the second part of the study, these pyrimidine derivatives and the azetidine derivatives were subjected to pharmacological screening test and were compared with the well known antidepressants, viz. imipramine, clomipramine and amitriptyline. These antidepressant drugs are the representative of the dibenzazepine and dibenzocycloheptene classes of compounds.) In this study, the azetidine derivatives showed antidepressant activity comparable to the reference drugs in all the tests whereas pyrimidine derivatives were considered to have antidepressant activity only on the basis of immobility test, which is a specific test for the second
generation antidepressant drugs. Brain monoamine levels were also measured to further ascertain the antidepressant properties of the compounds. These studies indicate that azetidine derivative have potent antidepressant activity whereas pyrimidine compounds may or may not be classified as antidepressant drug.

The chronic effect of azetidine compounds on the myocardium were also studied. The results of this study showed that antidepressants are non-toxic or have very little toxicity for the myocardium, when used chronically in low doses. Isoproterenol, a β-agonist was also studied for its effect on the myocardium and its effect on the antidepressant induced desensitization of β-adrenergic receptors in the heart. We found isoproterenol to have a beneficial effect on the myocardium.