PREFACE

The great breakthrough in the understanding of diabetes was the demonstration that acute diabetes followed pancreatectomy. Thereafter, the isolation and purification of insulin brought life to diabetics who, without it, faced death. Pancreatic islets of Langerhans represent a unique cluster of different types of cellular populations responsible for the biosynthesis and release of their characteristic hormones. Coordinated regulation in the release of these hormones is vital for the maintenance of a proper metabolic status of the body, especially the homeostasis of glucose. Thorough knowledge of the islets and the functions of its various cell types is, therefore, a must for understanding the mechanism through which a well balanced interaction of various peptide hormones of the islets brings about this delicate and vital biological effect. Any defect in the functioning of the islet cells is manifested in the form of imbalance in glucose homeostasis and, in many cases, develops into diabetic syndrome, the etiology and pathogenesis of which still remains to be fully elucidated. Sensitivity of the islet cells towards various secretagogues and the effect of other factors on the islet’s hormone release has been a subject matter for intensive research during the last more than two decades.

In this dissertation, attempts have been made to contribute towards the efforts in the direction of developing new hypoglycemic drugs for the management of type II diabetes. Attempts have also
been made to have some insight into the age related changes in the islet cells with respect to their sensitivity towards secretagogues. Some interesting properties of new synthetic analogues of C-terminal tetrapeptide amide of cholecystokinin indicating their potentiality to be effective hypoglycemic drugs have been presented. New findings on insulin like properties of (-)-epicatechin and its effect on the conversion of proinsulin to insulin and the effect of age of the animal thereon are some of the highlights of the studies presented in this dissertation.