

PREFACE

This thesis is the outcome of my Ph.D. work carried out at Zydus Research Centre and the Department of Chemistry, The Maharaja Sayajirao University of Baroda, Vadodara, India.

The thesis consists of four major sections, Introduction, Designing, Results & discussion, experimental and overall summary part which cover various aspects of metabolic diseases and development of DPP-IV inhibitors for the treatment of the Type 2 diabetes. Three papers have been published in international journals.

The ‘**Introduction**’ section deals with the general information about metabolic diseases, wherein detailed pathophysiology and the current therapeutic treatment options are discussed with its limitation, followed by an introduction to DPP-IV inhibitors as a target for the treatment of diabetes.

The ‘**Designing of DPP-IV inhibitors**’ section deals with the strategies and rationale for designing novel and sub-type selective DPP-IV inhibitors.

The ‘**Results & Discussion**’ section describes the synthesis, biological activities and molecular modeling studies of the novel compounds.

In the ‘**Experimental**’ section, detailed procedures for the synthesis of the compounds as well as the characterization data are presented. The details of various biological experiments are also described in this section.

The copy of spectra (ESI-MS, HPLC, $^1\text{H-NMR}$ & $^{13}\text{C-NMR}$) of most of the compounds from each series (intermediates and final compounds) are included at the end of the thesis, followed by copies of our publications.

Working for this thesis has been a great learning experience for me. Understanding the physiological pathway involved in metabolic syndrome and the biological roles of DPP-IV in this complex disease was very interesting and stimulative. Molecular modeling experiments provided good learning and were instrumental in understanding the ligand receptor interaction and structural requirements of the compounds to be synthesized. Presenting the work in the form of publications was equally a good learning experience.

Since this work has been carried out at Zydus Research Centre which is an industrial R&D centre as a medicinal chemist, it gives me a feeling of satisfaction that my drug design

strategies and the studies described in this thesis may form the basis for the development of novel DPP-IV inhibitors. The feeling of satisfaction is not only for the scientific outcome of the research work but also as it contributes for the social cause, since the ultimate need for the treatment of metabolic disorders such as diabetes. My philosophy is aligned with the mission statement of my organization which says that,

“ZRC aims to be the most admired pharmaceutical research centre for innovation in life science dedicated to alleviating human suffering”

Human suffering is increasing day by day owing to various life threatening diseases and due to absence of treatment or resistance to treatment. Current understanding of metabolic diseases and treatment options are good but not adequate enough. Hence every endeavor in the direction of developing novel therapies in this area would be a significant contribution towards alleviating human suffering.

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