Preface

Alzheimer's disease (AD) is a progressive neurodegenerative disorder with cognitive, functional, and behavioural alterations. AD is age-related and causes substantial structural and functional damage to the brain resulting in severe cognitive dysfunction. World Health Organization (WHO) estimated that by 2050, one in every 85 people in the world would be living with AD. Medications that will improve cognition or ameliorate neuropsychiatric symptoms of patient in the symptomatic phase of AD are needed to improve memory and behaviour. However, current treatment strategies for this disease is still in its infancy and fails to delay the progression of the disease. The new approach of multi-target directed ligands (MTDLs) has been adopted recently, which involves targeting multiple enzymes simultaneously with a single molecule.

The research work presented in the thesis is divided into three parts. The first part deals with *de novo* fragment growing strategy for the design of novel 3,5-diarylpyrazoles and hit optimization of spiropyrazoline derivatives as acetyl cholinesterase inhibitors. The second series includes a library of 2-substituted benzo[d]oxazol-5-amine derivatives, designed by using the scaffold hopping guided MTDLs strategy. The designed compounds were synthesized and evaluated through various *in-vitro* and *in-vivo* biological studies. The neurobehavioral studies in rats were performed to assess the effect of compounds in improving the learning and memory. The third part involves the establishment of multi-modal approach with ChEs, NMDAR antagonism, Aβ aggregation and neurotoxicity. Wherein, we investigated novel triazole bridged cycloaryl hybrids. The study led to the publication of two research papers.