PREFACE

The ever increasing demand for efficient syntheses and functionalization of biologically active 4-quinolone scaffolds remains the major interest to the synthetic chemist. In the area of antibiotics, the 4-quinolone ring has been heavily investigated and is an attractive synthetic target in organic synthesis. It is found in numerous natural product structures as the core structural motif of many antibacterial agents. So the development of suitable protocol to functionalize the 4-quinolone scaffold of its various positions in organic transformations is well accepted.

The present research work describes the suitable approaches towards the synthesis and the functionalization of 4-quinolone moiety. This thesis begins with **Chapter I**, which depicts a brief review on the development of methodologies for the synthesis as well as functionalization of 4-quinolone scaffold. **Chapter II** deals with Pd-NHC catalysed carbonylative sonogashira annulations for the synthesis of 4-quinolone and flavones. **Chapter III** contains a rapid and simple carbonylative Suzuki coupling for the synthesis of biaryl ketones and its application towards the synthesis biologically active 4-quinolone scaffolds. Newer methodologies for the synthesis of C-S linkage 4-quinolone derivatives using Pd-NHC and Ni catalyst has been described in **Chapter IV** and **Chapter V**. Rather, the **Chapter VI** is to focus on the synthesis of 6-aryl substituted 4-quinolones *via* regioselective bromination. The last two chapters (**VII** and **VIII**) demonstrates the regiocontrolled nitration and selective C-NH_2 arylation of 4-quinolone under ambient condition.