

TABLE OF CONTENTS

Abstract.....	i-ii
Preface.....	iii
List of Tables.....	x
List of Schemes.....	xi-xv
List of Figures.....	xvi
List of Appendices.....	xvii-xx
Appendix A: List of Research Publications.....	xviii-xix
Appendix B: Oral & Poster Presentations.....	xx
Abbreviation.....	xxi-xxii

Chapter I.

A brief review on synthesis and functionalization of 4-quinolones.....	1-76
I.A. 4-quinolone.....	2
I.A.1. Development of the synthesis of 4- quinolones.....	4
I.A.1.a. Metal free synthesis of 4-quinolones.....	4
I.A.1.b Metal catalysed synthesis of 4-quinolones.....	31
I.B. Functionalization of 4-quinolones.....	46
I.B.1. Decarbonylative cross-coupling reactions.....	46
I.B.2. Decarboxylative C-S cross-coupling.....	47
I.B.3. Sonogashira coupling reaction.....	49
I.B.4. Suzuki cross-coupling.....	51
I.B.5. Alkenylation coupling.....	51
I.B.6. Heck coupling.....	53
I.B.7. Decarboxylative cross-coupling.....	53
I.B.8. C-H bond activation.....	56
I.B.9. Decarboxylative ipso nitration.....	58
I.B.10. Transitional metal free C-3 arylation.....	60

I.B.11. Alkynylation of 4-quinolones.....	62
I.B.12. –CF ₂ unit insertion of 4-quinolones.....	64
I.B.13. C-N coupling.....	65
I.B.14. Ru catalysed C-H annulations of 2-arylquinolinone	66
I.B.15. Regiocontrolled nitration of 4-quinolones.....	68
I.B.16. Synthesis of 6-aryl substituted 4-quinolones.....	70
I.B.17. Suzuki coupling and cyanation.....	70
I.B.18. Regioselective Suzuki, Sonogashira and cyanation.....	71
I.B.19. Regioselective zincation at C-2 and C-3 position of 4-quinolones.....	72.
I.C. Miscellaneous reactions of 4-quinolones.....	72
I.D. Conclusions.....	76
I.E. References.....	76

Chapter-II.

Pd-NHC catalysed carbonylative Sonogashira coupling for the formation of 4-quinolones and 4*H*-chromen-4-one77-90

II.A. Introduction.....	78
II.B. Present work: Background & objective.....	78
II.B.1. Present work: Result and discussion.....	80
II.C. Conclusion.....	83
II.D. Experimental Section.....	83
II.D.1. General Information.....	83
II.D.2. Preparation of various 4-quinolone derivatives.....	83
II.D.3. Preparation of various flavone derivatives	84
II.D.4. Physical characteristics and spectral data of compounds.....	84
II.E. References.....	90

Chapter-III.

Pd-NHC catalysed carbonylative Suzuki cross coupling reactions of aryl halides and arylboronic acids and its application towards the synthesis of biologically active 4-quinolone scaffolds.....91-114

III.A. Introduction.....	92
III.B. Present work: Background & objective.....	93
III.B.1. Present work: Result and discussion.....	95
III.C. Conclusion.....	100
III.D. Experimental Section.....	100
III.D.1. General Information.....	100
III.D.2. Preparation of Biaryl ketones from the carbonylative Suzuki coupling of various iodoarenes and arylboronic acids.....	100
III.D.3. Physical characteristics and spectral data of compounds	101
III.E. References.....	114

Chapter IV

Pd-NHC catalysed thioetherification of 3-iodo-2-aryl substituted 4-quinolone derivatives *via* C-S cross coupling.....115-138

IV.A. Introduction.....	116
IV.B. Present work: Background & objective.....	116
IV.B.1. Present work: Result and discussion.....	118
IV.C. Conclusion.....	121
IV.D. Experimental Section.....	122
IV.D.1. General Information.....	122
IV.D.2. Preparation of Various 3-iodo-2-phenyl substituted 4-quinolones.....	122
IV.D.3. Preparation of Various thioether substituted 4-quinolones.....	122
IV.D.4. Physical characteristics and spectral data of compounds	122
IV.E. References.....	138

Chapter V

Ni catalysed C-S cross coupling of 3-iodo-2-aryl substituted-4-quinolone derivatives.....139-162

V.A. Introduction.....	140
V.B. Present work: Background & objective.....	140
V.B.1. Present work: Result and discussion.....	141
V.C. Conclusion.....	144
V.D. Experimental Section.....	145
V.D.1. General Information.....	145
V.D.2. Preparation of Various 3-iodo-2-phenyl substituted 4-quinolones.....	145
V.D.3. Preparation of Various thioether substituted 4-quinolones.....	145
V.D.4. Physical characteristics and spectral data of compounds	145
V.E. References.....	162

Chapter VI

Microwave assisted synthesis of 6-aryl substituted 4-quinolones via regioselective bromination at C-6 position-"precursor of bioactive molecules.".....163-180

VI.A. Introduction.....	164
VI.B. Present work: Background and objective.....	164
VI.B.1 Present work: Result and discussion.....	165
VI.C. Regioselective bromination at C-6 position.....	166
VI.D. Conclusion.....	169
VI.E. Experimental.....	170
VI.E.1. General consideration.....	170
VI.E.2. Preparation of compound 1.....	170
VI.E.3. Physical characteristics and spectral data of compounds 1.....	170
VI.E.4. Preparation of N-methylated derivatives.....	172
VI.E.5. Preparation of bromo derivatives.....	173

VI.E.6. Preparation of 6-aryl substituted 4-quinolones.....	175
VI.F. References.....	180

Chapter VII

NTFB (nitronium tetrafluoroborate) induced regioselective synthesis of nitro derivatives of 4-quinolone at ambient condition.....181-194

VII.A. Introduction.....	182
VII.B. Present work: Background & objective.....	182
VII.B.1 Present work: Result and discussion.....	183
VII.C. Conclusion.....	187
VII.D. Experimental Section.....	188
VII.D.1. General Information.....	188
VII.D.2. Preparation of Compound (1-4).....	188
VII.D.3. General Procedure of Nitration reaction (compound 1a-8h).....	188
VII.D.4. Preparation of compound 5 and 8.....	189
VII.D.5. Preparation of compound 6.....	189
VII.D.6. Physical characteristics and spectral data of compounds	189
VII.E. References.....	194

Chapter-VIII

Ligandless copper catalysed rapid and selective C-NH₂ arylation of 4-quinolone at ambient condition195-222

VIII.A. Introduction.....	196
VIII.B. Present work: Background and objective.....	197
VIII.B.1. Present work: Result and discussion.....	198
VIII.C. Conclusion.....	203
VIII.D. Experimental.....	203
VIII.D.1. General Information.....	203
VIII.D.2. Preparation of Amine derivatives of 4-quinolones	203
VIII.D.3. Preparation of N-arylated derivatives of 4-quinolones (3a-3i).....	203

VIII.D.4. Preparation of N-arylated derivatives of 4-quinolones (6a-6i)	204
VIII.D.5. Physical characteristics and spectral data of compounds	204
VIII.E. References.....	222
Bibliography.....	223-239
References for Chapter I.....	223-227
References for Chapter II.....	227-229
References for Chapter III.....	229-231
References for Chapter IV.....	232-233
References for Chapter V.....	233-234
References for Chapter VI.....	234-236
References for Chapter VII.....	236-237
References for Chapter VIII.....	237-239
Index.....	240-241