INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Thesis Title: Copper-Catalyzed Cascade C-H Functionalization and C-N Bond Formation: Synthesis of Functionalised Benzimidazoles

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SHORT ABSTRACT

The thesis contains five chapters which contains synthesis of benzimidazole derivatives which are important structural scaffolds due to their interesting biological and medicinal properties. The chapter one covers the recent developments in the construction of benzimdiazoles. Considerable progress has thus been made using cross-coupling and C-H functionalization strategies. The chapter two describes the Cu-catalyzed oxidative three components coupling of anilines, aldehydes and $TMSN_3$ in the presence of TBHP at moderate temperature. The reaction of a series of anilines and aromatic as well as aliphatic aldehydes with $TMSN_3$ has been demonstrated. The chapter three focuses on Cu-catalyzed oxidative three component coupling of anilines, benzylamines and NaN_3 in the presence of TBHP at moderate temperature. The reaction involves a tandem transamination, C-H functionazation and C-N bond formation to produce the target products in good yields. The chapter four deals with the Cu-catalyzed oxidative three component coupling of anilines, methyl arenes and $TMSN_3$ in the presence of TBHP to produce benzimidazole derivatives. This reaction involves a multiple C-H functionalization and C-N bond formation. The mechanistic study suggests that the reaction involves the formation of *N*-benzylamine followed oxidation to imine, ortho-selective azidation and intramolecular cyclization. The chapter five gives an overall idea of the thesis work. Hopefully, this study will open new avenue for the further development of regioslective multiple C-H functionalization of simple substrates to produce diverse nitrogen containing heterocycles.