



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI  
SHORT ABSTRACT OF THESIS

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Programme of Study : Ph.D.

Thesis Title: "Exploration of 3-Aminocoumarins for Construction of Pyridocoumarins and Pyrrolocoumarins & Synthesis of Fused Oxazoles and Thiazoles via Oxidative C-H Bond Functionalization"

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The thesis entitled "Exploration of 3-Aminocoumarins for Construction of Pyridocoumarins and Pyrrolocoumarins & Synthesis of Fused Oxazoles and Thiazoles via Oxidative C-H Bond Functionalization" has been divided into six chapters.

In Chapter I gives literature survey about the importance of coumarins and 3-aminocoumarins and the synthesis of pyridocoumarins and pyrrolocoumarins. A brief account on various methodologies for the synthesis of 3-aminocoumarins and synthesis of heterocyclic compounds involving 3-aminocoumarins have also presented in this chapter.

Chapter II is divided into Chapter IIA & Chapter IIB, respectively and it describes the synthesis of various pyrido(2,3-c)coumarin derivatives. In chapter IIA trifluoromethanesulfonic acid (TfOH) has been used as a catalyst to synthesize pyrido(2,3-c)coumarin derivatives from 3-aminocoumarins and propargylated salicylaldehydes by an intramolecular Povarov reaction whereas in chapter IIB various pyrido(2,3-c)coumarin derivatives have been achieved from 3-aminocoumarins and phenylacetaldehydes using *p*-toluenesulphonic acid monohydrate (PTSA-H<sub>2</sub>O) as a catalyst. Chapter III describes the synthesis of the pyrrolocoumarin derivatives via multicomponent reaction using 3-aminocoumarins, the *in situ* generated arylglyoxaldehydes from acetophenones and 4-hydroxycoumarin. Prior to the results and discussion for the synthesis of coumarin fused oxazoles and thiazoles via oxidative C-H bond functionalization in Chapter V and VI respectively, a brief introduction to oxidative C-H bond functionalization and various methodologies reported in literature for the synthesis of coumarin fused oxazoles and thiazoles have been presented in chapter IV. Chapter V describes the synthesis of coumarin fused oxazoles from 3-(benzylamino)-2*H*-chromen-2-one derivatives where TBHP has been used as an oxidant and CuCl<sub>2</sub> as a catalyst. Chapter VI describes the synthesis 3-(benzylamino)-4-bromo-2*H*-chromen-2-one derivatives by selective monobromination of 3-(benzylamino)-2*H*-chromen-2-ones using BDMS as a brominating reagent and the synthesized 3-(benzylamino)-4-bromo-2*H*-chromen-2-ones have been used as a starting material to achieve coumarin fused thiazole derivatives using iodine as a catalyst and H<sub>2</sub>O<sub>2</sub> as an oxidant. All the synthesized compounds have been fully characterized by IR spectra, <sup>1</sup>H-NMR & <sup>13</sup>C-NMR spectra, HRMS and elemental analysis. In each chapter, one or more compounds have also been characterized by Single Crystallographic Data for further confirmation of the structure of the newly synthesized compounds.