



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Programme of Study : **Ph.D.**

Thesis Title: **Studies Towards C-C and C-N Bond Formation using Strained Rings: A Probe for Heterocycle Formation**

Name of Thesis Supervisor(s) : **Prof. T. Punniyamurthy**

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SHORT ABSTRACT

The thesis is organized into four chapters. The initial chapter delineates a tandem C–N bond formation for the oxidative annulation of indolines with aziridines, utilizing a combination of DDQ and NaOCl under ambient conditions. The second chapter addresses the annulative coupling of donor-acceptor cyclopropanes with cyclic secondary amines, employing Ni(OTf)₂ and visible light-assisted eosin Y catalysis for tandem C–N and C–C bond formation. The third chapter focuses on the coupling of cyclic secondary amines with donor-acceptor cyclopropanes using MgI₂ and Mn(OAc)₃•2H₂O, leading to the synthesis of fused indolizine derivatives. The fourth chapter showcases an efficient annulation of *in situ* formed azaoxyallyl cations with diaziridines, yielding 1,2,4-triazines at room temperature.