



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
PhD-17 SHORT ABSTRACT OF THESIS

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SHORT ABSTRACT

This thesis reports the development of sustainable native functional group directed C–H functionalization strategies that enable site-selective transformations without the use of exogenous directing groups. By leveraging transition-metal catalysis, along with the use of carboxylic acids and ketones as weakly coordinating yet effective directing groups, and by employing Morita–Baylis–Hillman (MBH) adducts as versatile coupling partners, the work advances step and atom economical strategies for constructing molecular complexity. The thesis is organized into four chapters. The first chapter presents advances in weakly chelating carboxylate and ketone directed site-selective C–H functionalization and annulation strategies for benzoic acids and aryl ketones. The second chapter explores redox-neutral, site-selective C–H allylation and iodolactonization of benzoic acids using MBH adducts in water. The third chapter demonstrates a Pd-catalyzed substrate-switchable C–H alkenylation and alkylation of benzoic acids using MBH alcohols. The fourth chapter details a Ru-catalyzed weak-chelation-assisted C–H allylation of aryl ketones using MBH alcohols.