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Nota di contenuto	Introduction to the Total Synthesis of Lactone-Containing Natural Products using ZrCl4 -- Asymmetric Synthesis of the -Methyl-Substituted Analogues of (+)-Tanikolide and (–)-Malyngolide -- Asymmetric Synthesis of Both Enantiomers of a d-Lactone Analogue of Muricatacin -- Introduction to the Development of a Catalytic Asymmetric Synthesis of Tertiary -Aryl Ketones -- A Stereoselective Switch: Enantiodivergent Approach to the Synthesis of Isoflavanones -- Asymmetric Synthesis of Tertiary -Aryl Ketones by Decarboxylative Asymmetric Protonation.
Sommario/riassunto	This thesis addresses two fundamental areas in contemporary organic chemistry: synthesis of natural products and catalytic asymmetric synthesis. Firstly, a new methodology, developed by our research group, which allows the asymmetric synthesis of lactones, a structural unit ubiquitous in natural products, was utilised in the synthesis of a number of natural product analogues that showed significant biological activity. Secondly, the development of a catalytic asymmetric synthesis of a key structural motif present in a number of natural products and pharmaceuticals was accomplished. During the course of this work we

discovered dual stereocontrol, which is significant because it allows the configuration of a new stereocentre to be controlled by a simple change of proton source.