

Education & Training

1990: CHEMISTRY DEGREE cum laude, University of Modena;

1991-1994: Ph.D. IN CHEMICAL SCIENCES, University of Parma ("Metal-catalyzed oxidation of organic substrates")

1995: CORSO DI PERFEZIONAMENTO IN METODOLOGIA DELLA RICERCA DI LABORATORIO, University of Modena;

1996-1999: POST-DOCTORAL POSITION at the Department of Chemistry, University of Modena ("Transition-metal catalyzed radical reaction");

2000-present: ASSISTANT PROFESSOR of Organic Chemistry, University of Modena and Reggio Emilia.

Research Experience

1. Biocatalysis: exploitation of enzymes and/or microorganisms (both free and immobilised) in organic synthesis.
 - a. asymmetric reduction of activated carbon-carbon double bonds:
 - i. screening of non-conventional yeasts for enoate reductase activities;
 - ii. isolation, purification and structural characterization of enoate reductase from yeasts;
 - iii. analysis of yeasts genome to identify putative enoate reductase genes;
 - iv. cloning and expression of enoate reductase from yeasts;
 - v. study of the catalytic properties of whole cells system and of isolated enoate reductase;
 - vi. application of enoate reductases to the stereoselective alkene reductions to prepare chiral building blocks;
 - b. biocatalytic modification of natural compounds:
 - i. lipase and esterase from different sources as biocatalysts for the synthesis of lipophilic derivatives of natural polyphenols;
 - ii. glycosidase as biocatalysts for the synthesis of hydrophilic derivatives of natural polyphenols;
 - c. biocatalytic formation of carbon-carbon bonds:
 - i. laccases and peroxidases from different sources as biocatalysts for the formation of carbon-carbon bonds (radical coupling of phenolic derivatives) to obtain biologically active compounds;
 - ii. chemo-enzymatic synthesis of 2,3-diarylbenzo[b]furans;
 - iii. chemo-enzymatic synthesis of furo-3,7-diarylpyridines;
 - d. biocatalysts immobilization.
2. Bioactive products (naturals and synthetics): synthesis and investigation of the biological activity of polyphenols.
 - a. isolation, purification and structure elucidation of bioactive polyphenols from agricultural wastes;
 - b. synthesis and structural characterization of polyphenols, and screening of their activity as potential anti-inflammatory and cancer preventive agents;
 - c. enzymes as biocatalysts for the selective modification of different natural polyphenols.
3. Green chemistry
 - a. Biorefinery of industrial wastes: valorization of agroindustrial wastes applying biocatalytic methodologies to obtain more valuable fine-chemicals, for application in pharmaceutical and cosmetic field beyond that in food industry.

Other information

Author of more than 50 papers

Member of the "Società Chimica Italiana", "American Chemical Society", "Associazione Italiana di Biocatalisi e Bioseparazioni" and "Società dei Matematici e Naturalisti di Modena"

Referee for some top-ranked international Journals (*Advanced Synthesis and Catalysis*, *Journal of Organic Chemistry*, *European Journal of Inorganic Chemistry*, *Bioorganic and Medicinal Chemistry*, *Bioorganic and Medicinal Chemistry Letters*, *Journal of Agricultural and Food Chemistry*, *ChemMedChem*, *ChemBioChem*, *Synthesis*, *Tetrahedron Letters*, *Chemistry-A European Journal*, *Journal of Molecular Catalysis B Enzymatic*, *Biocatalysis and Biotransformation*, *Protein and Peptide Letters*)