Curriculum Vitae

Dr Claudia Sanfilippo*, CNR researcher of Institute of Biomolecular Chemistry*

Claudia Sanfilippo was born in Catania in 1965. She graduated with honors in Organic Chemistry in 1990 at the University of Catania and in 1998 she obtained her PhD in Organic Chemistry at the Department of Chemical Sciences of the University of Catania discussing a thesis entitled "Desymmetrization of *meso*-alcohols in the presence of lipase applied to the synthesis of chiral compounds". From 1991 to 1993 she held a fellowship as researcher at the CNR-Istituto per lo Studio delle Sostanze Naturali di Interesse Alimentare e Chimico-Farmaceutico of Catania working on "Biocatalytic Processes in Organic Synthesis". Since 1994 she is a permanent researcher at CNR-Istituto di Chimica Biomolecolare (ICB-CNR), UOS of Catania.

Scientific activity

Her research activity is currently carried out within the thematic "Development of sustainable processes for the preparation of high value added molecules" and mainly deals with the study of enzyme-catalyzed biotransformations of biologically active chiral or prochiral organic molecules useful in the pharmaceutical field. The study of enzymatic activity and the optimization of biocatalytic and/or chemo-enzymatic procedures in terms of both chemical yields and enantiomeric purity of the products have been particularly addressed.

In this context, lipases have been mostly investigated and advantageously used in the kinetic resolution of racemates under mild conditions of temperature and pH, in aqueous systems as well as in non-conventional medium (organic solvent and ionic liquids). A variety of lipase-catalyzed stereoselective reactions of esterification, transesterification and hydrolysis to obtain chiral alcohols, acids and esters and direct amidation of carboxylic acids in the presence of amines or aminolysis of esters to obtain enantiomerically enriched amides have been applied and optimized.

More recently, with a view to a more sustainable biocatalysis, she has been interested in stereoselective oxidation reactions catalyzed by oxygenases (lipoxygenases and peroxygenases) obtained from plant sources. In particular, raw extracts of soybean and oat flours containing the enzymes have been used to catalyze the regio- and stereoselectively oxidation (hydroxylation or epoxidation) of polyunsaturated fatty acids (PUFA) in the presence of O_2 or *tert*-butyl hydroperoxide as oxidizing agents. The study of the activity of some epoxide hydrolases contained

in vegetable flours, to be used in the stereoselective hydrolytic process of opening of epoxides for the synthesis of chiral diols, is also in progress.

She has developed expertise on chiral chromatographic techniques HPLC and GC for the analysis of enantiomeric purity of the products, spectroscopic techniques (UV, IR and circular dichroism) and NMR spectrometry for the determination of the structure, absolute configuration and conformational stability of chiral molecules.

The scientific activity resulted in the participation in many national and international conferences and in the publication of articles and reviews in peer-reviewed international journals.

Throughout the period of her work as a researcher at CNR, she has taken part in many research projects as a researcher, as an operational unit manager and as a tutor in the laboratory of fellows. In addition, she has done teaching activities in higher education courses, in training activities for high school and has participated in public events of scientific dissemination.