

Title	Development of a Chemoenzymatic Green Synthesis of Bioactive Peptides
PI	Marta De Zotti
Research Group	Bioorganic Chemistry
Curriculum	Chemical Sciences
Location	Organic Chemistry
Contact	web: https://wwwdisc.chimica.unipd.it/marta.dezotti/marta1.htm
	email: marta.dezotti@unipd.it

Project description:

Bioactive peptides are suitable for a variety of applications, from pharmaceutical active ingredients to cosmetics and food packaging. They ensure specificity and less off-target effects than small molecules, while being cheaper and more stable than proteins. Antimicrobial peptides are also ideal candidates to fulfill the need for effective and sustainable plant protection products, to replace cupric substances and traditional fungicides.

Chemoenzymatic peptide synthesis (CEPS) is an expanding sector, but suffers from the lack of standardized protocols and from a high variability of results, depending on the laboratory in which it is applied. With this project, we aim to (i) setup reliable and reproducible CEPS protocols for all coupling steps towards peptide sequences of industrial interest, using immobilized enzymes and substrates produced by green methods; (ii) devise an effective strategy for in-flow purification; (iii) perform in-flow CEPS reactions, enzyme-mediated deprotection, and purification. Immobilized biocatalysts and in-flow purification strategies will be employed, towards the setup of an automatable platform, ideally able to perform all steps for peptide production in-flow, and transferable to the scientific community and to companies interested in peptide synthesis.

Publications:

Int. J. Mol. Sci., 21, 7521 (2020).

Int. J. Mol. Sci., 22, 8362 (2021).

Collaborations/Network:

Prof. Lucia Tamborini, University of Milan, Italy; Enzyme-mediated reactions.

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