

BBE-Biotechnology, Biochemistry and Enzymology



Prof. Loredana MARINIELLO

Room 2N-39; phone +39-0812539470

Email loredana.mariniello@unina.it

Website <https://www.docenti.unina.it/loredana.mariniello>

ORCID <https://orcid.org/0000-0002-6800-5890>

Publications <https://www.iris.unina.it/cris/rp/rp23301?sortBy=2&order=DESC&type=all>

Website research group <http://www.transglutaminase-what.org/>

[Facebook](#)

<https://www.linkedin.com/company/biotecnologie-biochimiche-ed-enzimologia-bbe/?viewAsMember=true>



Prof. C. Valeria L. GIOSAFATTO

Room 2N-37; phone +39-081674297

Email giosafat@unina.it

Website <https://www.docenti.unina.it/giosafat>

ORCID <https://orcid.org/0000-0001-8762-2205>

Publications <https://www.iris.unina.it/cris/rp/rp10816?sortBy=2&order=DESC&type=all>



Dr. Odile Francesca RESTAINO

Room 2N-35; phone +39-081-2539473

Email odilefrancesca.restaino@unina.it

Website <https://www.docenti.unina.it/odilefrancesca.restaino>

ORCID <https://orcid.org/0000-0001-5939-3759>

Other Group members:

- Dr. Marika Avitabile (PhD student)
- Dr. Sefora Esposito (PhD student)
- Dr. Talayeh Kordjazi (PhD student)

BBE RESEARCH

1) Use of transglutaminase as biotechnological tool

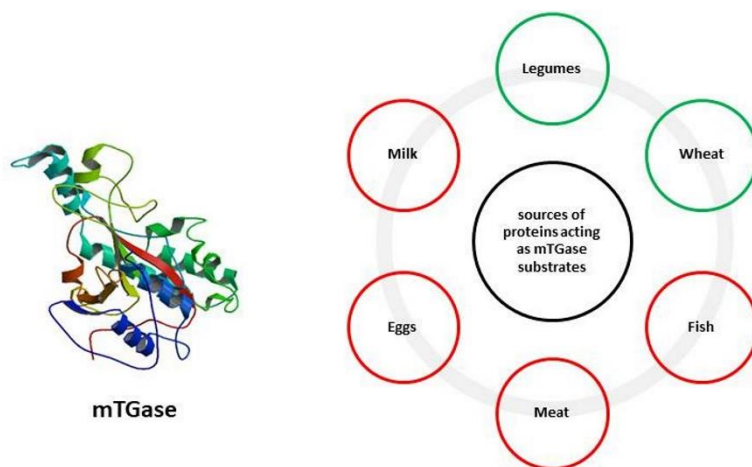
Transglutaminases (TGases; 2.3.2.13) are a family of enzymes able to catalyze the formation of isopeptide bonds between endoprotein gamma-carboxamide groups of glutamine residues and epsilon-amino groups of lysine residues, giving rise to linear or branched protein homo- and heteropolymers. TGases, and microbial molecular form of the enzyme (mTGase) exhibiting peculiar characteristics (resistance, not cation-dependency, wide range of optimal pH), can be utilized as an effective tool *in vitro* to modify the structure and function of both peptides and proteins able to act as acyl donor and/or acceptor substrates for the enzyme. We carry out purification and immobilization studies of the enzyme and research devoted to find out new TGase substrates either from animal and plant tissue to modify their biological properties, such as antimicrobial activity, their allergenicity and digestibility.

Main collaborations:

Prof. Alan Mackie, School of Food Science & Nutrition, University of Leeds, UK.

Prof. Mingsheng Dong, College of Food Science and Technology, Nanjing, Agricultural University, China

Profs Neila Trifi and Sonia Marghali, Faculté des Sciences de Tunis, Tunisia.



2) Production and characterization of bioplastics

Bioplastics are an attractive eco-friendly alternative since they can be easily degraded by the enzymes present in different microorganisms. In our group we produce hydrocolloid bioplastics by using unexpansive raw materials originating from agro-industrial wastes. These materials are made of natural biopolymers (polysaccharides, protein and their derivatives) with peculiar characteristics of mechanical resistance and gas permeability. To improve their functional properties, the enzyme transglutaminase of microbial origin has been successfully exploited by our group during the last 15 years. To further strengthen the hydrocolloid film matrix, we also use different plasticizers, such as glycerol or polyamines, able to improve the technological features of the films. They are also reinforced with nanoparticles and/or blended with other hydrophobic polymers. Finally, the obtained bioplastics are exploited as carriers of active molecules for their possible application to improve food preservation.

Main collaborations:

Prof Andreas Blennow, Dept. of Plant and Environmental Sciences, University of Copenhagen, Denmark.

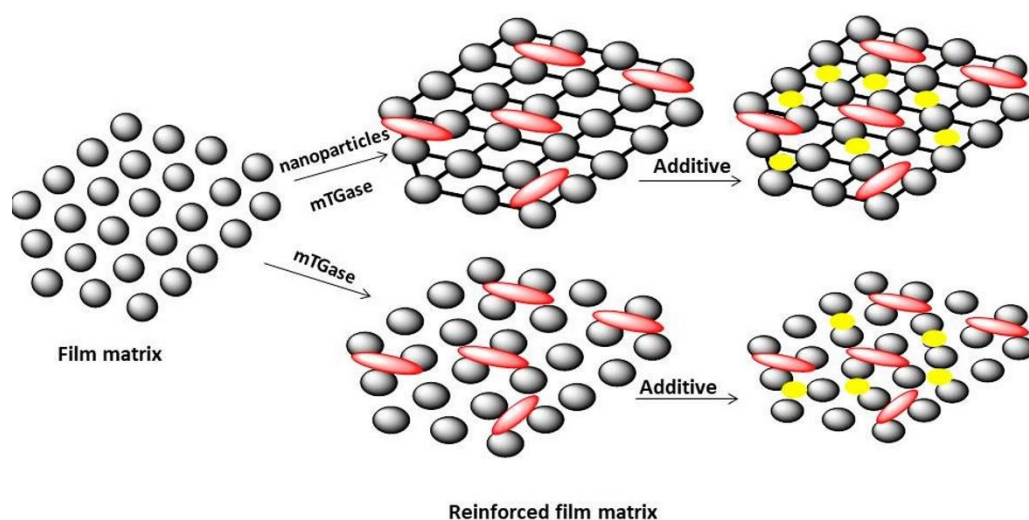
Prof. Reynaldo Villalonga, Facultad de Ciencias Químicas, Complutense University of Madrid, Spain.

Prof. Marzieh Moosavi-Nasab, Shiraz University, Shiraz, Iran.

Prof. Vignesh Kumaravel, ICRI-BioM, Lodz University of Technology, Lodz, Polonia

Profs Natasa Simin and Marija Lesjak, Department of Biochemistry and Environmental Protection, faculty of Science, University of Novi Sad, Serbia

Profs Asmaa Al-Asmar and Mohammed Sabbah, An-Najah university, Nablus, Palestine



3) Biotechnological production of biomolecules with potential industrial applications

The design of bioprocesses is a key point in the biotechnological field. The group has expertise in the development of biotechnological processes to produce biomolecules (polysaccharides, proteins, enzymes, pigments) with potential industrial applications by using *wild type* and recombinant microbial strains, through initial physiological studies, optimization of fermentation processes, scale up, and innovative purification procedures.

Main collaborations:

Dr. Christine Delbarre Ladrat, Dr. Sylvia COLLIEC-JOUAULT, IFREMER, French National Institute for Ocean Science and Technology, Nantes, France.

Fundings: “Sustainable Melanin production by Lignocellulose Agricultural byproducts for food safety applications (MeLA)”, PRIN 2022 PNRR.