# Curriculum NICOLETTA SPRETI

Nicoletta Spreti got a Degree in Biological Sciences at the University of Perugia in 1986. Since 1 October 2006 she is Associate Professor of Organic Chemistry (SSD CHIM / 06) and is currently in service at the Department of Physical and Chemical Sciences of the University of L 'Aquila. In the A.Y. 2006/07-2012/13 she has held the position of Coordinator of the Degree Courses in Chemistry and Materials. She was a member of the College of Teachers "Chemistry for the Environment and Cultural Heritage" and of "Physical and Chemical Sciences". She has been supervisor of numerous degree and doctoral theses.
Recently, she has been leader (with Cinzia Casieri) of the research unit UNIVAQ for the project Smart Cities and Communities and Social Innovation - MIUR SCN_00520 "Innovazione di prodotto e di processo per una manutenzione, conservazione e restauro sostenibile e programmato del patrimonio culturale".

## Teaching activity

She has held numerous teaching courses in the Organic Chemistry sector and currently holds the courses of "Bioorganic Chemistry" for the Master's Degree Course in Chemical Sciences, part of the "Organic Chemistry II with Laboratory" for the Bachelor's Degree Course in Chemical and Materials Science and Technology and of the "Organic Chemistry" for the Bachelor's Degree Course in Biotechnology.

## Scientific activity

The research activity focuses on some general issues developed over the years; the main areas of interest can be summarized in the following topics:

1. Study of the effects of nanostructured supramolecular systems on model chemical reactions in water and organic solvent and relative quantitative study of structure-reactivity relationships;
2. Study of the interactions of amphiphilic molecules and nanostructured systems with enzymes;
3. Design and synthesis of ionic liquids and eutectic solvents (DES) as reaction media and for the decontamination of water from heavy metals;
4. Use of silica matrices and nanocomposite materials for the stabilization of enzymes;
5. Preparation and use of new biocompatible hydrogels for the removal of microbial contaminants from calcareous stone materials;
6. Preparation and optimization of biocompatible films based on polysaccharides and/or proteins for the preservation of food products.

She is the author of over 70 publications in international journals and over 100 communications at national and international conferences.

## Pubblicazioni (2018-2023)


A. Vetrano, F. Gabriele, N. Spreti. "Prevention of swelling phenomenon of alginate beads to improve the stability and recyclability of encapsulated HLADH". **ChemBioChem** (2023) under review.

F. Gabriele, C. Casieri, A. Vetrano, N. Spreti. "Evaluation of acrylic and silane coatings on limestone through macroscopic and microscopic analyses". **Mater. Chem. Phys.** (2023) under review.

A. Vetrano, I. Daidone, N. Spreti, M. Capone. "A combined experimental and computational approach for the rationalization of the catalytic activity of lipase B from *Candida antarctica* in water-organic solvent mixtures". **J. Chem. Technol. Biotechnol.** (2023) in press. https://doi.org/10.1002/jctb.7467

L. Bruno, C. Casieri, F. Gabriele, R. Ranaldi, L. Rugnini, N. Spreti. "In situ application of alginate hydrogels containing oxidant or natural biocides on Fortunato Depero's mosaic (Rome, Italy)". **Int. Biodeterior. Biodegrad**., **183,** 105641 (2023). https://doi.org/10.1016/j.ibiod.2023.105641

F. Gabriele, M. Chiarini, R. Germani, N. Spreti. “Understanding the role of temperature in structural changes of choline chloride/glycols deep eutectic solvents”. **J. Mol. Liq., 385**, 122332 (2023). https://doi.org/10.1016/j.molliq.2023

F. Gabriele, R. Ranaldi, L. Bruno, C. Casieri, L. Rugnini, N. Spreti. “Biodeterioration of stone monuments: Studies on the influence of bioreceptivity on cyanobacterial biofilm growth and on the biocidal efficacy of essential oils in natural hydrogel”. **Sci. Total Environ**., **870**, 161901 (2023). https://doi.org/10.1016/j.scitotenv.2023.161901

F. Gabriele, L. Bruno, C. Casieri, R. Ranaldi, L. Rugnini, N. Spreti. “Application and monitoring of oxidative alginate-biocide hydrogels for two case studies in “The Sassi and the Park of the Rupestrian Churches of Matera”. **Coatings, 12**, 462 (2022). https://doi.org/10.3390/coatings12040462

R. Ranaldi, L. Rugnini, F. Gabriele, N. Spreti, C. Casieri, G. Di Marco, A. Gismondi, L. Bruno. “Plant essential oils suspended into hydrogel: development of an easy-to-use protocol for the restoration of stone cultural heritage”. **Int. Biodeterior. Biodegrad., 172,** 105436 (2022). https://doi.org/10.1016/j.ibiod.2022.105436

A. Vetrano, F. Gabriele, R. Germani, N. Spreti. “Characterization of lipase from *Candida rugosa* entrapped in alginate beads to enhance its thermal stability and recyclability”. **New J. Chem., 46,** 10037 - 10047 (2022). https://doi.org/10.1039/D2NJ01160C

M. Capone, L. Zanetti-Polzi, I. Leonzi, N. Spreti, I. Daidone. “Evidence for a high $pK_a$ of an aspartic acid residue in the active site of CALB by a fully atomistic multiscale approach”. **J. Biomol. Struct. Dyn.** (2022) May 20:1-8. https://doi.org/10.1080/07391102.2022.2077834

F. Gabriele, A. Vetrano, L. Bruno, C. Casieri, R. Germani, L. Rugnini, N. Spreti. “New oxidative alginate-biocide hydrogels against stone biodeterioration”. **Int. Biodeterior. Biodegrad., 163**, 105281 (2021). https://doi.org/10.1016/j.ibiod.2021.105281

F. Gabriele, M. Tortora, L. Bruno, C. Casieri, M. Chiarini, R. Germani, N. Spreti. “Alginate-biocide hydrogel for the removal of biofilms from calcareous stone artworks”. **J. Cult. Herit., 49,** 106-114 (2021). https://doi.org/10.1016/j.culher.2021.02.009.

F. Gabriele, A. Donnadio, M. Casciola, R. Germani, N. Spreti. “Ionic and covalent crosslinking in chitosan-succinic acid membranes: effect on physicochemical properties”. **Carbohyd. Polym., 251,** 117106 (2021). https://doi.org/10.1016/j.carbpol.2020.117106

F. Gabriele, L. Goracci, R. Germani, N. Spreti. “Refining the model to design α-chymotrypsin superactivators: the role of the binding mode of quaternary ammonium salts”. **New J. Chem.**, **44**, 20823-20833 (2020). https://doi.org/10.1039/D0NJ04676K

M. Tortora, M. Chiarini, N. Spreti, C. Casieri. “$^{1}$H-NMR-relaxation and colorimetry for evaluating nanopolymeric dispersions as stone protective coatings”. **J. Cult. Herit., 44**, 204-210 (2020). https://doi.org/10.1016/j.culher.2019.12.014

F. Gabriele, M. Chiarini, R. Germani, M. Tiecco, N. Spreti. “Effect of water addition on choline chloride/glycol deep eutectic solvents: characterization of their structural and physicochemical properties”. **J. Mol. Liq., 291,** 111301 (2019). DOI: 10.1016/j.molliq.2019.111301.

F. Gabriele, N. Spreti, T. Del Giacco, R. Germani, M. Tiecco. “Effect of surfactant structure on the superactivity of *Candida rugosa* lipase”. **Langmuir, 34**, 11510-11517 (2018); DOI: 10.1021/acs.langmuir.8b02255.

S. García-Embid, F. Di Renzo, L. De Matteis, N. Spreti, J.M. de la Fuente. “Magnetic separation and high reusability of chloroperoxidase entrapped in multi polysaccharide micro-supports”. **Appl. Catal. A: Gen.**, **560**, 94-102 (2018); DOI: 10.1016/j.apcata.2018.04.029.