

# Serena Leone

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## WORK EXPERIENCE

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02/03/2020–present    **Researcher**

Stazione Zoologica Anton Dohrn, Napoli (Italy)

Research Activity: My research interests comprise the study of the interplay between biological macromolecules produced by marine organisms, from their isolation and structure characterization, to the definition of structure-function relationships. Current projects include the study of protein-mediated intraspecies communication in the Mediterranean sea urchin *Paracentrotus lividus* and the characterization of proteins and peptides involved in trophic and prey/predator interactions from the venoms of neglected marine species. In addition, I am currently involved in the implementation of meta-proteomics and meta-metabolomic protocols in the framework of the Naples Ecological REsearch Augmented observatory (NEREA).

01/09/2019–30/11/2019    **Postdoctoral fellow**

Università degli Studi di Napoli “Federico II”, Napoli (Italy)

Research Activity: Evaluation of production of full-length TATκ28-CDKL5\_1 using pP79 in *Pseudoalteromonas haloplanktis* TAC125

15/01/2019–04/03/2019    **Postdoctoral Fellow**

Università degli Studi di Napoli “Federico II”, Napoli (Italy)

Research activity: Development of a protocol for the physico-chemical characterization of the human protein TATκ28-CDKL5\_1 produced in *Pseudoalteromonas haloplanktis* TAC125.

30/12/2013–29/12/2018    **Researcher (RTD-A)**

Università degli Studi di Napoli Federico II, Napoli (Italy)

Research Activity: As member of the Structural Biology group of Prof. D. Picone, I have been performing studies on the structure and structure/ activity relationships of sweet proteins and the rational design of protein constructs with improved function. I have been conducting studies on the structure and aggregation propensity of amyloidoigenic proteins and peptides. I have also been working on the cloning, expression and purification of recombinant proteins from various hosts and on the optimization of the strategies for the production and purification on the large scale of recombinant proteins.

01/07/2011–30/11/2013    **Senior research associate**

Boston College, Boston (United States)

Research Activity: I have worked in the glycobiology program of Prof. D.S. Newburg on the isolation, structural characterization and determination of structure-function relationships of bioactive and immunogenic glycoconjugates (glycoproteins, proteoglycans, glycolipids and free carbohydrates) from Human Milk, by means of biochemical techniques and Mass Spectrometry. I have also performed the development and validation of new analytical methods for the quantitation and analysis of glycoconjugates in biological systems by MS.

01/03/2010–30/10/2010    **Postdoctoral fellow**

Instut de Biologie structurale "J.P. Ebel", Grenoble (France)

**Research activity:** I have worked in the laboratories of Dr. Carlo Petosa on the expression and purification of recombinant viral proteins, specifically the Rta proteins from Epstein-Barr Virus and Kaposi's Sarcoma Herpesvirus, for the purpose of their structural characterization by X-Ray crystallography, alone or in complexes with partner DNA. I have studied Protein-DNA interactions by biochemical methods (EMSA).

01/10/2007–31/01/2010 **Postdoctoral Fellow**

Brigham and Women's Hospital, Harvard Medical School, Boston (United States)

**Research activity:** I worked in the laboratories of Prof. J.Y. Wang, at the Channing lab, performing studies aimed at the depiction of the molecular mechanisms underlying the pathogenesis of autoimmune diseases (i.e. Rheumatoid Arthritis). My research has been focused on the description of new protein–glycosaminoglycans and protein–protein interactions from studies on cell lines and clinical isolates as well as computational and NMR studies.

01/09/2009–01/11/2009 **Visiting Scientist**

Faculté de Pharmacie, Université de Picardie – Jules Verne, Amiens (France)

**Research activity:** In the framework of the project at the Harvard Medical School, I worked on the development of a force field for the description of sulfated polysaccharides in Molecular Dynamics softwares (i.e. Amber, Gromacs).

01/11/2004–01/05/2005 **Visiting Scientist**

Liebniz Centre for Medicine and Biosciences, Borstel (Germany)

**Research Activity:** In the framework of the PhD thesis, I worked in the laboratories of Prof. O. Holst on the purification and structural characterization of glycolipids and teichoic acids from thermophile bacteria, by means of chemical analyses, high resolution NMR spectroscopy and Mass Spectrometry.

## EDUCATION AND TRAINING

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01/10/2003–12/12/2006 **PhD in Chemical Sciences (Organic Chemistry)**

EQF level 8

Università degli studi di Napoli Federico II, Napoli (Italy)

**Thesis title:** Structure Characterization of Glycolipids from extremophilic Gram-negative bacteria membranes.

**Research activity:** My research, in the laboratories of Prof. A. Molinaro, was focused on the isolation, purification and structural characterization of glycolipids and lipopolysaccharides from extremophile and marine bacteria, to detect unique molecular features developed as adaptive response to different environmental stressors. To this purpose, I exploited a wide range of biochemistry and organic chemistry laboratory techniques, together with high resolution NMR spectroscopy and Mass Spectrometry.

01/10/1998–16/07/2003 **Laurea in Chimica**

EQF level 7

Università degli studi di Napoli Federico II, Napoli (Italy)

Experimental thesis in the laboratories of Prof. A. Molinaro.

**Thesis title:** Structural study of the oligosaccharide core from the lipopolysaccharide isolated from *Pseudomonas stutzeri* OX1.

## ADDITIONAL INFORMATION

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**Grants and Funding**

2020 - “Structural/functional characterization of full-length hCDKL5 isoform 1 produced in recombinant marine bacteria and use of pharmacological chaperones to stabilize hCDKL5 missense mutants”, awarded by the LouLou foundation, CDKL5 Program of Excellence Pilot Grant Program (Co-PI).

2023 - “Sea Inspired STructured hybrid biomateRials based on Self-assembling protein scaffolds (SISTERS)”, PRIN 2022 grant (Participant)

2023 - “Secreted compounds in Echinoderms chemical communication (SECRETS)”, PRIN PNRR

2022 (PI).

Technology transfer	<p>In 2015, I have been co-founder of the academic Spin-Off "iSweetch s.r.l.s.", for the design and production of functionally enhanced sweet proteins and their application to food and beverage preparations.</p> <p>iSweetch ranked third in the Start-up competition promoted by TechHub (Camera di Commercio e Banco di Napoli). I have been the spokesperson for iSweetch at several international events (including EXPO, TS-Next, International Forum on Industrial Biotechnology).</p>
Scientific Organizations and Coordination of academic activities	<p>Organizing Committee: Summer School "The Evolution of Enzymes and Metabolic Pathways in Marine Organisms" June 28-30, 2022, Stazione Zoologica Anton Dohrn Napoli</p> <p>Chair and Italian Ambassador of BioGeoSCAPES Italy (<a href="https://biogeoscapes.org">https://biogeoscapes.org</a>).</p> <p>Member of the COST Action European Venom Network (EUVEN) - CA19144</p>
Teaching activities and PhD supervision	<p>2018-2020 - Professor of Chemistry for the Laurea Triennale in Ottica e Optometria (Optics and Optometry), Department of Physics, Università degli Studi di Napoli "Federico II", Napoli (Italy)</p> <p>2019 - PhD course on Solid state NMR Spectroscopy, Department of Chemical Sciences, Università degli Studi di Napoli "Federico II", Napoli (Italy)</p> <p>2022 – PhD course on Protein isolation and purification, Stazione Zoologica Anton Dohrn, Napoli (Italy).</p> <p>2014 – 2018 - Assistance to the teaching laboratories of Chemistry for the "laurea triennale" in Biology (BGA) and Chemistry in the years 2014-18.</p> <p>Currently supervisor of 2 PhD students (Annalisa Zuccarotto, Patrizia Romano), I have supervised and co-supervised over 10 Master Degree students in their thesis work.</p>
Editorial activity	<p>Guest Editor for the special issue "Structure, Function and New Developments of Sweet Proteins" of Life (ISSN 2075-1729)</p> <p>Reviewer activity for Peer Reviewed journals (i.e., International Journal of Peptide Research and Therapeutics, Microbial Cell Factories, Frontiers in Molecular Biosciences, Marine Drugs)</p>
Bibliometric Indicators	<p>Indexed publications: 51 (Scopus), 53 (WOS)</p> <p>H-index: 18 (Scopus, WOS)</p> <p>Total citations: 1137 (Scopus), 1080 (WOS)</p> <p>(August, 31<sup>st</sup> 2023)</p>
Publications	<p>(1) <b>Leone, S.</b>; Izzo, V.; Silipo, A.; Sturiale, L.; Garozzo, D.; Lanzetta, R.; Parrilli, M.; Molinaro, A.; Di Donato, A. A Novel Type of Highly Negatively Charged Lipooligosaccharide from <i>Pseudomonas Stutzeri</i> OX1 Possessing Two 4,6-O-(1-Carboxy)-Ethylidene Residues in the Outer Core Region. <i>European Journal of Biochemistry</i> <b>2004</b>, 271 (13), 2691–2704. <a href="https://doi.org/10.1111/j.1432-1033.2004.04197.x">https://doi.org/10.1111/j.1432-1033.2004.04197.x</a>.</p> <p>(2) <b>Leone, S.</b>; Izzo, V.; Sturiale, L.; Garozzo, D.; Lanzetta, R.; Parrilli, M.; Molinaro, A.; Di Donato, A. Structure of Minor Oligosaccharides from the Lipopolysaccharide Fraction from <i>Pseudomonas Stutzeri</i> OX1. <i>Carbohydrate Research</i> <b>2004</b>, 339 (16), 2657–2665. <a href="https://doi.org/10.1016/j.carres.2004.09.006">https://doi.org/10.1016/j.carres.2004.09.006</a>.</p> <p>(3) Silipo, A.; <b>Leone, S.</b>; Lanzetta, R.; Parrilli, M.; Sturiale, L.; Garozzo, D.; Nazarenko, E. L.; Gorshkova, R. P.; Ivanova, E. P.; Gorshkova, N. M.; Molinaro, A. The Complete Structure of the Lipooligosaccharide from the Halophilic Bacterium <i>Pseudoalteromonas Issachenkonii</i> KMM 3549T. <i>Carbohydrate Research</i> <b>2004</b>, 339 (11), 1985–1993. <a href="https://doi.org/10.1016/j.carres.2004.05.008">https://doi.org/10.1016/j.carres.2004.05.008</a>.</p> <p>(4) Silipo, A.; <b>Leone, S.</b>; Molinaro, A.; Lanzetta, R.; Parrilli, M. The Structure of the Phosphorylated Carbohydrate Backbone of the Lipopolysaccharide of the Phytopathogen Bacterium <i>Pseudomonas Tolaasii</i>. <i>Carbohydrate Research</i> <b>2004</b>, 339 (13), 2241–2248. <a href="https://doi.org/10.1016/j.carres.2004.06.015">https://doi.org/10.1016/j.carres.2004.06.015</a>.</p> <p>(5) <b>Leone, S.</b>; Izzo, V.; Lanzetta, R.; Molinaro, A.; Parrilli, M.; Di Donato, A. The Structure of the O-Polysaccharide from <i>Pseudomonas Stutzeri</i> OX1 Containing Two Different 4-Acylamido-4,6-Dideoxy-Residues, Tomosamine and Perosamine. <i>Carbohydrate Research</i> <b>2005</b>, 340 (4), 651–656. <a href="https://doi.org/10.1016/j.carres.2005.01.004">https://doi.org/10.1016/j.carres.2005.01.004</a>.</p> <p>(6) Silipo, A.; <b>Leone, S.</b>; Molinaro, A.; Sturiale, L.; Garozzo, D.; Nazarenko, E. L.; Gorshkova, R. P.;</p>

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