Umberto Rosani, Ph.D.

Birthplace: Merano (BZ), Italy | umberto.rosani@unipd.it

Date of birth: 14th April 1984 | Nationality: Italian

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H-index: 18
No. of citations: 1,236

Current Position(s)

Researcher in Genetics (BIO/18, RTDa), Department of Biology, UniPD (Italy) from 2020
Adjunct Associate Professor at Stony Brook University (US) from September 2023

Previous Position

Postdoctoral Fellow at the Alfred Wegener Institute, Coastal Ecology group (Germany) 2018-2019

Education

PhD in Biosciences and Biotechnology | 2012 | University of Padova
Dissertation: Transcriptional responses and AMP transcript diversity in *Mytilus galloprovincialis*

MS in Environmental Science and Technologies | 2008 | University of Padova
Dissertation: Gene expression profiles of mussels of the lagoon of Venice using DNA microarray
110/110

BS in Environmental Science and Technologies | 2006 | University of Padova
Dissertation: GMO and traditional crops: technical and legislative aspects
110/110 *cum laude*

Other Research Experience

Postdoctoral fellow | University of Padova | 2017-2018
From recent findings to the functional role of cytokine-like homologs in r bivalve mollusks.

Research contract | University of Padova | Oct 2014- Dec 2016
Data mining of bivalve transcriptome dataset and characterization of mollusk peptides.

Postdoctoral fellow | Innov-H2O project | Jan 2012- Sept. 2014
As one of the six young researchers recruited by the cross-border Italy-Slovenia INNOV-H2O project, I was formed to transfer research outcomes to industry, aiming to improve the aquaculture sector (http://www.innov-h2o.eu/).

Research contract(s) | University of Padova | Apr. 2008- Dec. 2011
Research contracts related to the study of the bivalve immune system.

National Civil Service | University of Padova | 2007
The quality of water environment: pollution, complimentary biological and chemical methodologies (Prof. Paolo Bisol).

Teaching experience

OTHER ACTIVITIES ON INFORMATION AND COMMUNICATION SUBJECT (BIOINFORMATICS)
2 CFU (8h teaching + 16h practical), Bachelor's Degree in Biotechnology, Academic Years 2020/21, 21/22, 22/23
Practical lessons in Genetics and Marine Microbiology (prof. Paola Venier), General physiology (Natural Science, prof. Laura Tallandini), Bioinformatics (Microbiology course, prof. Paola Venier). Organization of the class "Gene expression analysis" INNOVAQUA project, March 2013
SUPERVISION OF GRADUATE and PhD STUDENTS
Supervisor of >10 MSc graduate students, Dept. of Biology, UniPD
Supervisor of 3 PhD students (Biotechnology, Natural Sciences)

Research Skills

Wet-lab and molecular biology
Working with bivalve and fish species (maintenance, experimental infection, dissection and sample processing for RNA, DNA and protein collection)
DNA and RNA extraction from different matrices (water filtrates, sediments)

- Preparation and manipulation of nucleic acid samples (extraction, purification, labeling, hybridization)
- Preparation of sequencing libraries (Illumina and Nanopore) starting from dsDNA, ssDNA and RNA

Bioinformatics
- Data analysis of genomic, transcriptomics and metagenomic datasets
- Analysis of data produced with HTS (454, Illumina, PacBio, Nanopore)
- Production and analysis of microarray data
- Metagenomic assembly, binning, identification of viruses and functional characterization of metagenomes
- Identification of RNA variations
- SNP, RNA-seq analyses

Affiliation to Scientific Societies and Thematic groups

ELIXIR Marine Metagenomics/Microbiome focus group, with monthly meetings
World Aquaculture Society (WAS) – from 2018
Malacological Society of London – from 2018
Italian Developmental and Comparative Immunology Society (SIICS) – from 2010
American Society of Microbiology (ASM) – from 2021

Grant proposals

CALL	TITLE / ACRONYM	DUR.	ROLE	BUDGET	STATUS
National project	Assessment of microplastic and nanoplastic exposure associated with the consumption of Chamelea gallina clam (PLASTICVONG)	2 yr	Local co-PI	16.6 K Euro	Ongoing

SEED-UniPD	Development of a mRNA-rRNA ligation tool based on CRISPR-Cas13	1.5 yr	PI	11.5 k euro	Concluded
PRIN2022 (National project)	Reconstructing the domestication process of the white lupin (*Lupinus albus*) in the Mediterranean basin using pangenome graphs	2 yr	co-PI	222 k euro	Ongoing
PRIN PNRR (National project)	Developing a tool for the study of haplotype diversity in *Mytilus galloprovincialis*	2 yr	PI	250 k euro	Ongoing

Active collaborators

- Prof. Bassem Allam (Stony Brook University, US, bassem.allam@stonybrook.edu), bivalve genetics and genomics, host-pathogen interactions
- Dr. Chang-Ming Bai (Chinese Academy of Fishery Sciences, China, baicm@ysfri.ac.cn), viral diseases of bivalves, Ostreid herpesvirus-1
- Prof. Andrea Leonardi (Hospital of Padova, Italy, andrea.leonardi@unipd.it), eye diseases and microbiome
- Dr. Mathias Wegner (Alfred Wegener Institute, Germany, Mathias.Wegner@awi.de), oyster and bivalve transcriptomics, gene evolution
- Prof. Eivind Valen (University of Bergen, Norway), CRISPRS-Cas13 gRNA design, use of Nanopore for native RNA sequencing

Publication List

1. Mehrbod P, Brun P, **Rosani U**, Leonardi A, Ghavami S. Evaluation of Autophagy in Conjunctival Fibroblasts. Methods Mol Biol. 2024
2. **Rosani U**, De Felice S, Frizzo R, Kawato S, Wegner KM. FicD genes in invertebrates: A tale of transposons, pathogenic and integrated viruses. Gene. 2024.
3. **Rosani U**, Corinaldesi C, Luongo G, Sollitto M, Dal Monego S, Licastro D, Bongiorni L, Venier P, Pallavicini A, Dell'Anno A. Viral Diversity in Benthic Abyssal Ecosystems: Ecological and Methodological Considerations. Viruses. 2023
4. Levra S, **Rosani U**, Gnemmi I, Brun P, Leonardi A, Carriero V, Bertolini F, Balbi B, Profita M, Ricciardolo FLM, Di Stefano A. Impaired autophagy in the lower airways and lung parenchyma in stable COPD. ERJ Open Res. 2023.
5. Di Stefano A, **Rosani U**, Levra S, Gnemmi I, Brun P, Maniscalco M, D'Anna SE, Carriero V, Bertolini F, Ricciardolo FLM. Bone Morphogenic Proteins and Their Antagonists in the Lower Airways of Stable COPD Patients. Biology (Basel). 2023
6. **Rosani U**, Sollitto M, Salata C. Comparative analysis of Presence-Absence gene Variations in five hard tick species: impact and functional considerations. JPARA 2023
7. **Rosani U**, Gaia M, Delmont T, Krupovic M. Tracing the invertebrate herpesviruses in the global sequence datasets. Front. Mar Sci. 2023
8. Bortoletto E, Pieretti F, Brun P, Venier P, Leonardi A, **Rosani U**. Meta-Analysis of Keratoconus Transcriptomic Data Revealed Altered RNA Editing Levels Impacting Keratin Genomic Clusters. Invest Ophthalmol Vis Sci. 2023

9. Leonardi A, Daull P, **Rosani U**, Cavarzeran F, Salami E, Garrigue JS, Paola B. Evidence of epithelial remodelling but not epithelial-mesenchymal transition by transcriptome profiling in vernal keratoconjunctivitis. Allergy. 2022

10. Scapolatiello A, **Rosani U**, Manfrin C, Puljas S, Pallavicini A, Gerdol M. Identification of five picorna-like viruses associated with the endangered cave-dwelling bivalve *Congeria kusceri* (Bole, 1962). ISJ 2022

11. **Rosani U**. Tracing RNA viruses associated with Nudibranchia gastropods. PeerJ, 2022

12. Leonardi A, **Rosani U**, Cavarzeran F, Daull P, Garrigue JS, Paola B. Antiviral response in vernal keratoconjunctivitis may be protective against COVID-19. Allergy, 2022

13. **Rosani U**, Del Vecchio C, Franchin E, Brun P, Ferrari S, Ponzin D, Leonardi A. Tracing the SARS-CoV-2 infection on the ocular surface: Overview and preliminary corneoscleral transcriptome sequencing. Exp Eye Res. 2022.

14. Blasi G, Bortoletto E, Gasparotto M, Filippini F, Bai CM, **Rosani U**, Venier P. A glimpse on metazoan ZNFX1 helicases, ancient players of antiviral innate immunity. Fish Shellfish Immunol. 2022

15. **Rosani U**, Bortoletto E, Montagnani C, Venier P. ADAR-Editing during Ostreid Herpesvirus 1 Infection in *Crassostrea gigas*: Facts and Limitations. mSphere, 2022.

16. Bai CM, Zhang X, Venier P, Gu L, Li YN, Wang CM, Xin LS, **Rosani U**. Paired miRNA and RNA sequencing provides a first insight into molecular defense mechanisms of Scapharca broughtonii during ostreid herpesvirus-1 infection. Fish Shellfish Immunol. 2022

17. Saco A, Rey-Campos M, **Rosani U**, Novoa B and Figueras A. The Evolution and Diversity of Interleukin-17 Highlight an Expansion in Marine Invertebrates and Its Conserved Role in Mucosal Immunity. Front Microbiol. 2021

18. Bai CM, **Rosani U**, Zhang X, Xin LS, Bortoletto E, Wegner KM, Wang CM. Viral Decoys: The Only Two Herpesviruses Infecting Invertebrates Evolved Different Transcriptional Strategies to Deflect Post-Transcriptional Editing. Viruses. 2021

19. Morga B, Jacquot M, Pelletier C, Chevignon G, Dégremont L, Biétry A, Pepin JF, Heurtebise S, Escoubas JM, Bean TP, **Rosani U**, Bai CM, Renault T, Lamy JB. Genomic Diversity of the Ostreid Herpesvirus Type 1 Across Time and Location and Among Host Species. Front Microbiol. 2021

20. Leonardi A, Modugno RL, Cavarzeran F, **Rosani U**. Metagenomic analysis of the conjunctival bacterial and fungal microbiome in vernal keratoconjunctivitis. Allergy. 2021

21. **Rosani U**, Bortoletto E, Bai CM, Novoa B, Figueras A, Venier P, Fromm B. Digging into bivalve miRNAomes: between conservation and innovation. Philos Trans R Soc Lond B Biol Sci. 2021

22. Bortoletto E, Venier P, Novoa B, Figueras A, **Rosani U**. Evolutionary insights on a novel mussel-specific foot protein-3α gene family. ISJ 2021

23. Bortoletto E, Venier P, Shapiro M, Leonardi A, **Rosani U**. SARS-CoV-2 evasion from ADAR hyper-editing is both genome-encoded and sustained by the virus replication strategy. Preprint, 2021

24. Gerdol M, Moreira R, Cruz F, Gómez-Garrido J, Vlasova A, **Rosani U**, Venier P, Naranjo-Ortiz MA, Murgarella M, Greco S, Balseiro P, Corvelo A, Frias L, Gut M, Gabaldón T, Pallavicini A, Canchaya C, Novoa B, Alioto TS, Posada D, Figueras A. Massive gene presence-absence variation shapes an open pan-genome in the Mediterranean mussel. Genome Biol., 2020

25. Novoa B, Moreira R, Romero A, Rey-Campos M, Pereiro P, **Rosani U** and Figueras A. Rosani Stimulation of Mytilus galloprovincialis hemocytes with different immune challenges induces differential transcriptomic, miRNomic and functional responses. Front. Immunol., 2020

26. **Rosani U**, Abbadi M, Green T, Bai CM, Turolla E, Arcangeli G, Wegner M, Venier P. miRNAome analysis reveals new insights on natural infections of *Crassostrea gigas* by Ostreid herpesvirus 1. BMC Genomics, 2020

27. Leonardi A, **Rosani U**, Brun P. Ocular surface expression of SARS-CoV-2 receptors suggest potential infection through the eye. Ocular Immunology and Inflammation, 2020

28. Bai CM, Lu SX, **Rosani U**, Wu B, Wang QC, Duan XK, Liu ZH, Wang CM. Chromosomal-level assembly of the blood clam, *Scapharca* (Anadara) *broughtonii*, using long sequence reads and Hi-C. GigaScience, 2019

29. **Rosani U**, Domeneghetti S, Gerdol M, Pallavicini A, and Venier P. Expansion and loss events characterized the occurrence of MIF-like genes in bivalves. Fish Shellfish Immunol. 2019

30. **Rosani U**, Bai CM, Maso L, Shapiro M, Abbadi M, Domeneghetti S, Wang CM, Cendron L, MacCarthy T, Venier P. A-to-I editing of Malacoherpesviridae RNAs supports the antiviral role of ADAR1 in mollusks. BMC Evol Biol, 2019

31. **Rosani U**, Domeneghetti S, Maso L, Wegner KM, Venier P. An evolutionary perspective of Dopachrome Tautomerase Enzymes in Metazoans. Genes, 2019

32. **Rosani U**, Shapiro M, Venier P, Allam B. A Needle in A Haystack: Tracing Bivalve-Associated Viruses in High-Throughput Transcriptomic Data. Viruses, 2019

33. Bai CM, Zhang SM, Li YN, Xin LS, **Rosani U**, Wang CM. Dual Transcriptomic Analysis Reveals a Delayed Antiviral Response of *Haliotis diversicolor supertexta* against *Haliotid Herpesvirus-1*. Viruses 2019

34. Bai CM*, **Rosani U***, YN Li, SM Zhang, LS Xin, CM Wang. RNA-seq of HaHV-1-infected abalones reveals a common transcriptional signature of Malacoherpesviruses. SciRep, 2019 *equal contr.

35. **Rosani U**, Young T, Bai CM, Alfaro A, Venier P. Dual analysis of virus-host interactions: the case of OsHV-1 and the cupped oyster. Evol. Bioinf, 2019

36. Bai CM, Morga B, **Rosani U**, Shi J, Li C, Xin LS, Wang CM. Long-range PCR and high-throughput sequencing of *Ostreid herpesvirus 1* indicate high genetic diversity and complex evolution process. Virology, 2019

37. Venier P, Gerdol M, Domeneghetti S, Sharma N, Pallavicini A, **Rosani U.** Biotechnologies from marine bivalves. In: Goods and services of marine bivalves. Springer Nature, Singapore, 2018

38. Bai CM, **Rosani U**, Xin LS, Lia GY, Lia C, Wang QC, Wang CM. Dual transcriptomic analysis of *Ostreid herpesvirus 1* infected *Scapharca broughtonii* with an emphasis on viral anti-apoptosis activities and host oxidative bursts. Fish Shellfish Immunol., 2018

39. Furlan M, **Rosani U**, Gambato S, Irato P, Manfrin A, Mardirossian M, Venier P, Pallavicini A, Scocchi M. Induced expression of cathelicidins in trout (*Oncorhynchus mykiss*) challenged with four different bacterial pathogens. J Pept Sci. 2018

40. Abbadi M, Zamperin G, Gastaldelli M, Pascoli F, **Rosani U**, Milani A, Schivo A, Rossetti E, Turolla E, Gennari L, Toffan A, Arcangeli G, Venier P. Identification of a newly described OsHV-1 µvar from the North Adriatic Sea (Italy). J Gen Virol. 2018

41. **Rosani U**, and Venier P. Oyster RNA-seq Data Support the Development of *Malacoherpesviridae* Genomics. Front. Microbiol. 2017

42. **Rosani U**, Gerdol M. A bioinformatics approach reveals seven nearly-complete RNA-virus genomes in bivalve RNA-seq data. Virus Res. 2016

43. **Rosani U**, Pallavicini A, Venier P. The miRNA biogenesis in marine bivalves. PeerJ. 2016

44. **Rosani U**, Domeneghetti S, Gerdol M, Franzoi M, Pallavicini A, Venier P. Serum amyloid A in marine bivalves: an acute phase and innate immunity protein. Dev Comp Immunol. 2016

45. **Rosani U**, Varotto L, Gerdol M, Pallavicini A, Venier P. IL-17 signaling components in bivalves: comparative sequence analysis and involvement in the immune responses. Developmental and Comparative Immunology, 2015

46. **Rosani U**, Tarricone E, Venier P, Brun P, Deligianni V, Zuin M, Martines E, Leonardi A, Brun P. Atmospheric-pressure cold plasma induces transcriptional changes in ex vivo human corneas. PlosOne, 2015.

47. **Rosani U**, Varotto L, Domeneghetti S, Arcangeli G, Pallavicini A, Venier P. Dual Analysis of Host and Pathogen Transcriptomes in Herpesvirus-Positive *Crassostrea gigas*. Environmental Microbiology, 2014.

48. **Rosani U**, Domeneghetti S, Pallavicini A, Venier P. Target capture and massive sequencing of genes transcribed in *Mytilus galloprovincialis*. Biomed Research International, 2014.

49. Toubiana M, **Rosani U**, Giambelluca S, Cammarata M, Gerdol M, Pallavicini A, Roch P, Venier P. Toll signal transduction pathway in bivalves: Complete cds of intermediate elements and related gene transcription levels in hemocytes of immune stimulated *Mytilus galloprovincialis*. Dev Comp Immunol, 2014.

50. Domeneghetti S, Varotto L, Civettini M, **Rosani U**, Stauder M, Pretto T, Pezzati E, Arcangeli G, Turolla E, Pallavicini A, Venier P. Pathogen detection and mortality occurrence in *C. gigas* and *M. galloprovincialis* close-growing in shallow waters (Goro lagoon, Italy). Fish Shellfish Immunol., 2014.

51. Toubiana M, Gerdol M, **Rosani U**, Pallavicini A, Venier P, Roch P. Toll-like receptors and MyD88 adaptors in *Mytilus*: Complete cds and gene expression levels. Dev Comp Immunol., 2013.

52. Varotto L, Domeneghetti S, **Rosani U**, Manfrin C, Cajaraville MP, Raccanelli S, Pallavicini A, Venier P. DNA Damage and Transcriptional Changes in the Gills of *Mytilus galloprovincialis* Exposed to Nanomolar Doses of Combined Metal Salts (Cd, Cu, Hg). PLoSOne., 2013.

53. **Rosani U**, Varotto L, Rossi A, Roch P, Novoa B, Figueras A, Pallavicini A, Venier P. Massively parallel amplicon sequencing reveals isotype-specific variability of antimicrobial peptide transcripts in *Mytilus galloprovincialis*. PlosOne, 2011.

54. Domeneghetti S, Manfrin C, Varotto L, **Rosani U**, Gerdol M, De Moro G, Pallavicini A, Venier P. How gene expression profiles disclose vital processes and immune responses in *Mytilus* spp. ISJ, 2011.

55. Venier P, Varotto L, **Rosani U**, Millino C, Celegato B, Bernante F, Lanfranchi G, Novoa B, Roch P, Figueras A, Pallavicini A. Insights into the innate immunity of the Mediterranean mussel *Mytilus galloprovincialis*. BMC Genomics, 2011.

56. Varotto L, Domeneghetti S, **Rosani U**, Pallavicini A, Bisol P, Lanfranchi G, Venier P. DNA microarray analysis in M. galloprovincialis from the Venice lagoon. Scientific Research and Safeguarding of Venice. Research Programme 2006-2007. P.P. Campostrini Ed., CORILA (Venezia).

Selected Conference Presentations

- **U Rosani,** E Bortoletto, CM Bai, M Krupovic. Multiple omics to disentangle new facets of the enigmatic family of mollusk herpesviruses, US National Shellfisheries Association meeting, Charlotte, March 2024.
- **U Rosani**. Is ADAR-mediated RNA editing during Ostreid herpesvirus-1 infection pro- or anti-viral? Fish and Shellfish Immunology, Bodo (Norway), December 2022
- **U Rosani**. Digging into the mussel transcriptome by means of long read sequencing: advantages and limitations AMMR, Exeter (UK), November 2022.
- **U Rosani**, B Fromm, CM Bai, P Venier, KM Wegner. microRNAs: possible new players in bivalve antiviral immunity, SIICS, Varese, February 2020.
- **U Rosani**. A-to-I RNA editing against Ostreid herpesvirus 1. Final conference of the EU project Vivaldi, Brest, November 2019.
- **U Rosani**, S Domeneghetti, M Gerdol, F Vallese, E Bortoletto, G Zanotti, A Pallavicini, R Tavano, P Venier. What does Macrophage migration Inhibitory Factor do in *Mytilus galloprovincialis*. AMMR, Chioggia, August 2019.
- **U Rosani**, S Domeneghetti, CM Bai, M Shapiro, P Venier. Study of viral infections in bivalves as a tool to trace antiviral host pathways. SIICS, Rende, February 2019.
- CM Bai, B Morga, **U Rosani**, J Shi, C Li, L-S Xin, CM Wang. Long-range PCR and high-throughput sequencing of Ostreid herpevirus 1. Aqua 2018, Montpellier, August 2018.
- **U Rosani**, M Abbadi, S Domeneghetti, P Venier. Invited talk: An omics approach to understand oyster-OsHV-1 interaction. US National Shellfisheries Association meeting, Seattle, March 2018.
- **U Rosani**, S Domeneghetti, M Gerdol, G Arcangeli, A Pallavicini, P Venier. Antiviral immunity in oysters infected by *Ostreid herpesvirus-1*. Innate Immunity in Host-Pathogen Interactions; EMBL Symposia, Heidelberg, Germany June 2016.
- **U Rosani**, S Domeneghetti, M Gerdol, G Arcangeli, A Pallavicini, P Venier. Antiviral immunity in

oysters infected by *Ostreid herpesvirus-1*, SIICS, Lecce, February 2016.

- **U Rosani**, L Varotto, P Roch, B Novoa, A Figueras, A Pallavicini, P Venier. The intriguing sequence variability of antimicrobial peptides expressed in *M. galloprovincialis*. Functional Genomics and System Biology, Hinxton, UK, 2011.
- **U Rosani**, L Varotto, A Rossi, B Novoa, P Roch, A Figueras, P Venier. Variability of antimicrobial peptides in *Mytilus galloprovincialis*. SIICS, Modena, febbraio 2010.
- **U Rosani**, L Varotto, P Venier. Studying the variability of antimicrobial peptides in *Mytilus galloprovincialis*. Genome Informatics, NY, USA, 27-30 October 2009.

Personal Awards

- Short-term visiting Research Grant (EU Arqus), August 2022
- Enzo Ottaviani Prize for my research activity in the field of comparative immunology, Varese, February 2020
- US NSA junior scientist travel award for "Pearls of Wisdom: Synergizing Leadership and Expertise in Molluscan Genomics, Theo Murphy meeting" in September 2019
- Short Term Scientific Mission (STSM) Grant in the CA1512 COST Action, used to visit the AWI marine station in Sylt (Germany) in November 2018
- Travel Award of the Malacological Society of London, 2018
- Young research award, XV SIICS meeting, Ferrara 2014
- Best Young Presentation, Unione Zoologica Italiana meeting, Palermo 2010