


Ilenia Urso

Curriculum Vitae

Last update: 2023-11-04

Personal Information

Name and Surname Ilenia Urso
Place and Date of birth 
Nationality Italian
Address

Education and training

Position **PhD in Biosciences - Genetics, Genomics and Bioinformatics**
Institution University of Padova, Department of Biology
Supervisor Prof. Chiara Romualdi
Co-Supervisor Prof. Gabriele Sales

Thesis ***Integrated transcriptome reconstruction and annotation of three krill species: new insights on their life cycle and environmental adaptation***

Description Transcriptome analysis can be considered a key step for interpreting how organisms respond to environmental changes and understanding the functional products of their genome in different conditions or developmental stages. Since the RNA-seq technology allows detecting novel transcripts without additional genomic information, it represents an important and crucial step whenever we want to assess the functional genomics of non-model organisms, i.e. organisms for which there is no prior genetic and molecular information, without a reference genome and transcriptome. The final goal of this project is to create and annotate a de novo transcriptome assembly for three krill species in order to explore their gene expression levels across different developmental stages and their responses to different environmental conditions, allowing for a comparative and physiological study. The project is developed in collaboration with the Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research (Bremerhaven, Germany) and the Institute for Chemistry and Biology of the Marine Environment Carl Von Ossietzky University Oldenburg (Oldenburg, Germany).

Period 10/2018 - 09/2021

Position **Master's Degree in Marine Biology**

Institution Alma Mater Studiorum, University of Bologna, Italy

Supervisor Dott. Alessia Cariani

Co-Supervisors Prof. Fausto Tinti, Dott. Agostino Leone.

Thesis ***"First Assessment on Genetic Structure and Phylogeography of Mediterranean Blue Shark (*Prionace glauca*, L.1758) population using mitochondrial genevariation: a comparison with the Atlantic"***

Description This study focused on the genetic structure of the blue shark (*Prionace glauca*) in the Mediterranean Sea and North-Eastern Atlantic Ocean. Despite the species' wide distribution, little was known about its genetic diversity in these regions. Here I analyzed mitochondrial genes from shark samples collected from various locations. The fundamental goal of this study was to provide new molecular data about the Mediterranean blue shark populations, creating a new and unique dataset of Mediterranean blue shark mtDNA sequences available for further investigations and assessing the genetic diversity and phylogeographic structure of the Mediterranean blue shark, testing the hypothesis of genetic structure within the basin

Language English

Graduation date 18/02/2016

Final grade 110/110 cum laude

Activity **Internship for Master's Degree Thesis**

Institution Alma Mater Studiorum, University of Bologna, Italy
Department of Biological, Geological and Environmental Sciences - Laboratory of Genetics and Genomics of Marine Resources and Environment (GenoDREAM)

Description DNA extraction from blue shark tissue samples (muscle, fin) from different Mediterranean areas (Balearic Sea, Thyrrenian Sea, Adriatic Sea, Ionian Sea, Aegean Sea) and North-Eastern Atlantic area; design of new species-specific primer pairs for amplification of CR and CYT-B mtDNA regions; optimization of amplification conditions; data analysis: genetic diversity, differentiation, demographic trend.

Year 2015

Duration 10 months

Activity **Curricular Internship**

Institution Alma Mater Studiorum, University of Bologna, Italy
Department of Biological, Geological and Environmental Sciences - Laboratory of Experimental Ecology

Description Analysis of the impact of different levels of acidification on sediment; measures of algal volume variation, dry weight, fresh weight; measures of algal area and perimeter using ImageJ software.

Year 2014-2015

Duration 4 months

Activity **Experimental Marine Laboratory**
 Institution Alma Mater Studiorum, University of Bologna, Italy
 Center for Marine Research del Rudjer Boskovic Institute, Rovinj, Croazia
 Description Intertidal distribution of the epibenthos; chemical-physical-biological variability on different spatial scales; diversity of subtidal benthic populations (dredging); diversity of subtidal benthic populations (scratching)
 Year 2014
 Duration 2 weeks

Position **Bachelor's Degree in Biology**
 Institution University of Salento, Lecce, Italy
 Thesis ***"Tumor cell metabolism: the roles of glutamine and pyruvate carboxylase"***
 Graduation 10/04/2012
 date
 Final grade 100/110

Position **High School Diploma**
 Institution Second Level College of Science, Institute "Leonardo Da Vinci", Maglie (LE), Italy
 Final grade 100/100

Experiences

Position **Postdoctoral Research Fellow**
 Institution CNR - IBIOM (Institute of Biomembranes, Bioenergetics and Molecular Biotechnologies)
 Supervisor Prof. Graziano Pesole
 Topic *Development of bioinformatics methodologies for data analysis of massive sequencing through third generation platforms*
 Period 01/11/2022 - 31/10/2023

Position **Research Fellow**
 Institution University of Padova, Department of Biology - Laboratory of Computational Biology
 Supervisor Prof. Gabriele Sales
 Topic *Development of a single-cell transcriptomics bioinformatic analysis pipeline*
 Period 06/10/2021 - 05/10/2022

Teaching Activity Support

Course **"Informatics and Bioinformatics"**
Institution University of Padova, Department of Biology, Italy
Degree Molecular Biology
Teacher Prof. G. Sales
Academic Year 2019-2020, 2020-2021, 2021-2022

Course **"Omic datasets: experimental design and analysis"**
Institution University of Padova, Department of Biology, Italy
Degree Molecular Biology
Teacher Prof. G. Sales, Prof. C. Romualdi
Year 2019-2020, 2020-2021, 2021-2022

Courses Attended

"Training Course in Computational Methods for Epitranscriptomics"
Institution CNR, Bari, Italy
Lecturer Prof. P. Venier
Description Experimental planning, analytical strategies and computational approaches for applying Nanopore direct RNA Sequencing to profile RNA modifications
Period 26th-28th April 2023

Summer School: "The Evolution of Enzymes and Metabolic Pathways in Marine Organisms: analysis, understanding and implications for biotechnology"
Topic Theoretic lectures on function and evolution of enzymes and metabolic pathways. Insight on metabolic pathways engineering and optimization for biotechnological applications. Practical tutorials on the use of public databases and softwares, as well as high-throughput analyses
Lecturers Dr. Marco Gerdol (University of Trieste, Italy), Prof. Alessio Peracchi (University of Parma, Italy), Dr. Jae-Seong Yang (CRAG, Barcelona)
Institution Stazione Zoologica Anton Dohrn, Napoli
Period 28th-30th June 2022

"Essential and dispensable genes in living organism"

Institution University of Padova, Department of Biology, Italy
Lecturer Prof. P. Venier
Description Genetic and evolutionary aspects of genome size and gene content, encompassing the following topics: 1) Genome size, architecture and evolutionary trends in viruses, prokaryotes and eukaryotes; 2) Microbial pan-genomes, how do they work? 3) Evidence for essential and dispensable genes in plants and animals. 4) The *Mytilus* dispensable gene fraction: practical implications for gene expression studies
Year 2021
Duration 4 hours

"Cancer Biology and Therapies"

Institution University of Padova, Department of Biology, Italy
Lecturer Prof. M. Santoro, Dr. Gaia Codolo, Dr. F. Moret, Prof. E. Reddi
Description Important features of the tumor tissues and cancer cell populations highlighting histological, physiological and molecular differences with respect to healthy cells and healthy tissues. Several differences between healthy and cancer cells/tissues pave the way for the development of therapeutic approaches
Year 2020
Duration 4 days

"Multivariate Statistical Analysis"

Institution University of Padova, Department of Biology, Italy
Lecturer Proff. C. Romualdi and R. Eidukevicius
Description Introduction to multivariate regression analyses; dimension reduction techniques (clustering and Principal Component Analyses); logistic regression analyses; survival models
Year 2019
Duration 2 months

"Science Communication in Biomedicine and Biosciences"

Institution University of Padova, Department of Biology, Italy
Lecturer Elisabetta Mutto Accordi
Description Science storytelling, communication process, content selection, effective messages, written and visual communication, public speaking, invisibility in science, grant proposals, posters presentations, power point presentations
Year 2019
Duration 3 months

"Computational Biostatistics and Bioinformatics"

Institution University of Padova, Department of Biology, Italy
Lecturer Prof. Davide Risso
Description Introduction to biostatistics and bioinformatics, introduction to genomics, introduction to microarray and sequencing techniques, data analyses and quality control, normalization, differential expression, Multiple Testing, Gene-set Enrichment Analysis, Cluster Analysis, isoforms analysis, "Batch Effects" and "meta-analysis"
Year 2018-2019
Duration 3 months

"R Software Course"

Institution Alma Mater Studiorum, University of Bologna, Italy
Description Use of basic and application instruments for statistics analysis in R
Year 2014-2015
Duration 3 months

"English Course - B2 Level"

Institution Alma Mater Studiorum, University of Bologna, Italy
Year 2014-2015
Duration 1 month

Seminars Attended

"Oxford Nanopore Technologies Training - P2 Solo"

Lecturer Barbara Ottolini, Senior Field Applications Scientist
Year 2023

"Oxford Nanopore Technologies Seminar - "Nanopore WGS in critical care settings and clinical routine: your chance to maximise diagnostic rates"

Lecturer Dan Galalde, Associate Director, Segment Marketing; Barbara Ottolini, Senior Field Applications Scientist
Year 2023

"Webinar: Marine biofiltering organisms: from ecology to field studies"

Lecturer Martina Capriotti (Research Scientist, Department of Marine Sciences, University of Connecticut)
Year 2022

"Single-cell RNA sequencing with MAS-Seq: when genes are not enough"

Lecturer Harsharan Dhillon (Senior Scientist, PacBio); Roger Volden, PhD (Bioinformatics Scientist, PacBio); Elizabeth Tseng, PhD (Associate Director, Product Marketing, PacBio)
Year 2022

"Introduction to Nanopore Sequencing"

Lecturer Angelica Vittori (Strategic Account Manager for Italy); Tim Walker (Technical Applications Scientist)

Year 2022

"Integrating Bayesian Networks into ecosystem services assessment to support water management at the river basin scale"

Institution CMCC

Lecturer Hung Vuong Pham (CMCC Foundation – RAAS Division and Ca' Foscari University of Venice)

Year 2022

"Scheduling your day: Networked circadian clocks in the brain and body"

Institution University of Padova, Department of Biology, Italy

Lecturer Prof. Erik Herzog (Department of Biology -Washington University in St. Louis, USA)

Year 2021

"Tumor suppressors resurrection for cancer prevention and therapy"

Institution University of Padova, Department of Biology, Italy

Lecturer Dott. Anna Quagliari

Year 2020

"Pinpointing iron-interacting partners to decipher iron metabolism in plants"

Institution University of Padova, Department of Biology, Italy

Lecturer Dott. Gianpiero Vigani

Year 2019

"3rd Scientific Retreat of the Department of Biology"

Institution University of Padova, Department of Biology, Italy

Year 2019

"Effects of climate change on high elevation aquatic habitats: biological signals of ecological shifts"

Institution University of Padova, Department of Biology, Italy

Lecturer Drs Monica Tolotti and Cristina Bruno, Edmund Mach Foundation, Trento

Year 2019

"Using the transcriptome to study therapy response in leukaemia"

Institution University of Padova, Department of Biology, Italy

Lecturer Dott. Anna Quagliari

Year 2019

"Life and death by staphylococcal alpha-toxin are decided by cell-cell junctions"

Institution University of Padova, Department of Biology, Italy

Lecturer Prof. Sandra Citi

Year 2018

Congresses

"SIBBM 2023 Frontiers in Molecular Biology - Beyond Genomics: Next Generation Molecular Biology"

Institution SIBBM - The Italian Society of Biophysics and Molecular Biology

In-person event, participation

Period 26th-28th June 2023

"BITS Meeting 2023"

Institution Bioinformatics Italian Society

Poster "Optimizing Cas9 Targeted Sequencing for the Identification of Unknown Integration Sites"

Author **Ilenia Urso***, Simona Buonanno*, Anna Maria D'Erchia, Simona Manni, Biagio De Angelis, Franco Locatelli, Concetta Quintarelli, Graziano Pesole, Carmela Gissi

Period 21st-23rd June 2023

"London Calling 2023"

Institution Oxford Nanopore Technologies

Virtual Conference, participation

Period 17th-19th May 2023

"5th Scientific Retreat of the Department of Biology"

Institution University of Padova, Department of Biology, Italy

Talk "Long reads: shortening the path to understanding the impact of neonicotinoids on the calanoid copepod *Acartia tonsa*"

Author **Ilenia Urso**, Marco Picone, Chiara Romualdi, Elisa Camatti, Greta Battaggia, Alessandro Vezzi, Gabriele Sales

Period May 2022

"The 9th RECOMB Satellite on Computational Methods in Genetics"

Virtual Conference, participation

Period September 2021

"European Bioconductor Meeting 2020"

Virtual Conference, participation

Period December 2020

"SCAR Open Science Conference 2020"

Virtual Conference

Poster "Shedding light on the molecular clock of the Antarctic krill *Euphausia superba*"

Author Alberto Biscontin, Fabio Piccolin, **Ilenia Urso**, Cristiano Bertolucci, Achim Kramer, Rodolfo Costa, So Kawaguchi, Bettina Meyer, Gabriele Sales, Cristiano De Pittà

Period August 2020

"Research in Computational Molecular Biology - 24th Annual International Conference, RECOMB 2020"

Virtual Conference, participation

Period May 2020

"Polynomial-Time Statistical Estimation of Species Trees under Gene Duplication and Loss"

Virtual conference, participation

Lecturer Brandon Legried, Erin Molloy, Tandy Warnow and Sebastien Roch (RECOMB 2020)

Period May 2020

"4th Scientific Retreat of the Department of Biology"

Institution University of Padova, Department of Biology, Italy

Poster "De novo transcriptome assembly of Antarctic krill (*Euphausia superba*, Dana 1850) using ultra-deep sequencing technology"

Author **Ilenia Urso**, Alberto Biscontin, Cristiano De Pittà, Gabriele Sales, Chiara Romualdi

Period February 2020

Knowledge and Skills

Bioinformatic Tools

Trinity, Oases-Velvet, SPAdes, IDBA-tran, BinPacker, Trans-AbySS, RATTLE, Canu, EvidentialGene, NECAT, Flye, NextDenovo, Hifiasm, purgedups

BWA, Bowtie, STAR, SAMtools, BEDtools, Picard Tools, RNAfold, Mfold, Salmon, featureCounts

Trinotate, BUSCO, OrthoFinder, OrthoMCL, OMA, Interproscan

GATK, Clair3Trio, ANNOVAR, Medaka, Racon

BEAST, Haploviewer, MEGA, Amplifx, primer3 Input, ImageJ, GIS, IGV

Informatic Tools (programming languages, OS, ...)

- Basic** HTML, Java, Javascript
- Intermediate** LibreOffice, Windows and Microsoft Office (Word, Excel, PowerPoint), MacOS, PostgreSQL, CSS, Snakemake
- Advanced** R, Python (pandas, numpy, pysam, matplotlib, flask ecc...), Linux and Unix Bash, PHP, Bioconda, Docker, Singularity, Slurm, HTCondor, LATEX

Molecular Biology Techniques

- Intermediate** DNAextraction (InvisorbSpinTissueKit, Invitex (STRATEC Molecular), Wizard Genomic DNA Purification Kit, Promega), electrophoresis, PCR, sequencing, primer design.

Languages

- Italian Mother tongue
- English Advanced

Publications

Authors Mc Cartney, A. M., Formenti, G., Mouton, A., De Panis, D., Marins, L. S., Leitão, H. G., ... Pippel, M.

Title **The European Reference Genome Atlas: piloting a decentralised approach to equitable biodiversity genomics**

Year 2023

Journal *Preprint on bioRxiv*

DOI 10.1101/2023.09.25.559365

Authors Müller SJ, Pakhomov EA, **Urso I**, Sales G, De Pittà C, Michael K, Meyer B

Title **Gene expression patterns of *Salpa thompsoni* reveal remarkable differences in metabolism and reproduction near the Antarctic Polar Front**

Year 2023

Journal *Biology Letters - Under review*

Authors **Urso I**, Biscontin A, Corso A, Bertolucci C, Romualdi C, De Pittà C, Meyer B, Sales G.

Title **A thorough annotation of the krill transcriptome offers new insights for the study of physiological processes**

Year 2022

Journal *Scientific Reports*

DOI 10.1038/s41598-022-15320-5

Authors Müller SJ, Michael K, **Urso I**, Sales G, De Pitta C, Suberg L, Wessels W, Pakhomov E, Meyer B

Title **Seasonal and form-specific gene expression signatures uncover different generational strategies of the pelagic tunicate *Salpa thompsoni* during the Southern Ocean winter**

Year 2022

Journal *Frontiers in Marine Science*, 894

DOI 10.3389/fmars.2022.914095

Authors Corso D, Chemello F, Alessio E, **Urso I**, Ferrarese G, Bazzega M, Romualdi C, Lanfranchi G, Sales G, Cagnin S.

Title **MyoData: An expression knowledgebase at single cell/nucleus level for the discovery of coding-noncoding RNA functional interactions in skeletal muscle**

Year 2021

Journal *Computational and Structural Biotechnology Journal*, 19, 4142-4155

DOI 10.1016/j.csbj.2021.07.020

Authors Leone A, **Urso I**, Damalas D, Martinsohn J, Zanzi A, Mariani S, Sperone E, Micarelli P, Garibaldi F, Megalofonou P, Bargelloni L, Franch R, Macias D, Prodohl P, Fitzpatrick S, Stagioni M, Tinti F, Cariani A.

Title **Genetic differentiation and phylogeography of Mediterranean-North Eastern Atlantic blue shark (*Prionace glauca*, L. 1758) using mitochondrial DNA: panmixia or complex stock structure?**

Year 2017

Journal *PeerJ*, 5, e4112

DOI 10.7717/peerj.4112

Research Interests

- Computational Biology
- Transcriptomics
- Genomics
- Algorithms
- Marine Biology
- Ecology
- Biodiversity
- Evolution

Bari, 2023-11-04

Ilenia Urso

"In compliance with the Italian legislative Decree no. 196 dated 30/06/2003, I hereby authorize you to use and process my personal details contained in this document."