

Marina-Agapi Athanasouli, PhD

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Bioinformatics researcher with interdisciplinary training in computational and molecular biology and experience with diverse large-scale datasets across multiple organisms. Proficient mainly in R, Python and Bash, with expertise in genomic, transcriptomic and metagenomic data analysis. I have a strong interest in the integration of multi-omic modalities for the purpose of improving clinical applications and prognoses in biomedical research.

RESEARCH EXPERIENCE

POSTDOCTORAL RESEARCHER/BIOINFORMATICIAN. Apr 2025 - Present
Translational Microbiome Research Group, Department of Inner Medicine I & M3 Institute, Universitätsklinikum Tübingen (DE).

- ◇ Metagenomic analysis and multi-omics integration to detect associations between the gut microbiome, diet and clinical data of patients
- ◇ Pipeline development for shotgun metagenomic sequencing using Nextflow

DOCTORAL RESEARCHER. Apr 2019 - Dec 2024
Department for Integrative Evolutionary Biology, Max Planck Institute for Biology Tübingen (DE).

- ◇ Generation and analysis of NGS (WGS, RNA-seq) data from multiple organisms
- ◇ Algorithm implementation and optimization
- ◇ Network construction to visualize and interpret relationships within large-scale multi-omics datasets
- ◇ Bioinformatic support in separate projects
- ◇ Bacterial and nematode culturing

MSC RESEARCHER. Jun 2017 - Mar 2019
Software and Knowledge Engineering Laboratory, NCSR "Demokritos" (GR).

- ◇ Implementation of representations for genomic sequences combined with supervised machine learning classification algorithms to determine their efficiency in distinguishing between coding and non-coding genomic elements

EDUCATION

PH.D IN BIOINFORMATICS. *University of Tübingen (DE).* Apr 2019 - Dec 2024
◇ Thesis title: Interspecies interactions between the nematode *Pristionchus pacificus* and bacterial food sources
◇ Analysis and integration of multi-omics data, Phylogenetics, Systems Biology, Comparative Genomics

MSC IN BIOINFORMATICS. *National and Kapodistrian University of Athens (GR).* Oct 2016 - Mar 2019
◇ Thesis title: *Evaluation of representations for the classification of genomic sequences*
◇ Computational Biology with a focus on sequence representation and ML algorithm implementation

DIPLOMA (BSC/MSc) IN AGRICULTURE. *Agricultural University of Athens (GR).* Sep 2009 - Jul 2016
Specialization: Plant Breeding and Biometry
◇ Thesis title: *Preliminary evaluation of the genetic diversity in bitter vetch (*V. ervilia* L.) landraces with microsatellites*
◇ Agronomy, molecular plant breeding, phylogenetics

SKILLS

Computational biology: Extensive experience in NGS data analysis (genomic and transcriptomic), metagenomic analysis (Kneaddata, Metaphlan, HUMAnN, MaAsLin, HALLA), phylogenetics, comparative genomics and network analysis using the Markov Clustering Algorithm (MCL)

Programming and workflows: Extensive experience with R, Python, Bash, and LaTeX; additional experience with Java, SQL, Perl, and C; pipeline development using Nextflow and Bash scripting.

Computing: High-Performance Computing (Slurm, SGE-based HPC), Unix/Linux environment.

Molecular biology: Nucleic acid isolation, NGS library preparation, nematode and bacterial culture handling, bacterial transformation.

Research and communication: Scientific writing, project administration, and experimental design.

CERTIFICATES

7.QBWx: QUANTITATIVE BIOLOGY WORKSHOP. *MITx, edX* **2021**

◊ Analysis of diverse types of data, such as single-cell or genomics data combined with online lectures

MCB63x: PRINCIPLES OF BIOCHEMISTRY. *HarvardX, edX*. **2015**

◊ Biochemical foundations of biological concepts

7.00x: INTRODUCTION TO BIOLOGY. *MITx, edX*. **2013**

EXPERIMENTAL GENOME SCIENCE. *UPenn, Coursera*. **2013**

◊ Theoretical and practical aspects of genomics, proteomics, single-cell approaches and systems biology

CONFERENCES

- "Interspecies interactions between the nematode *Pristionchus pacificus* and bacterial food sources reveal candidate pathways regulating gene expression, behaviour and survival", Quantitative biology to molecular mechanisms conference, EMBL, Heidelberg, Germany, November 2024.

LANGUAGES

- English (Fluent)
- German (B1)
- French (A2)
- Greek (Native)

REFERENCES

- Dr. Christian Rödelisperger
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- Prof. Dr. Boris Macek
University of Tübingen, Institute for Cell Biology, Proteome Center
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- Prof. Dr. Ralf Sommer
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Phone: +49 7071 601 371
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LIST OF PUBLICATIONS

1. **Athanasouli M**, Loschko T, Rödelisperger C (2025). Interspecies systems biology links candidate bacterial pathways impacting nematode gene expression, behavior, and survival. *Genome Research* gr.280848.125
2. Rödelisperger C, Röseler W, **Athanasouli M** et al (2024). Genome Assembly of the Nematode *Rhabditoides Inermis* From a Complex Microbial Community. *Genome Biology and Evolution* 16(11).

3. Piskobulu V, **Athanasouli M** et al (2024). High nutritional conditions influence feeding plasticity in *Pristionchus pacificus* and render worms non-predatory. *Journal of Experimental Zoology Part B: Molecular and Developmental Evolution* 344(2).
4. **Athanasouli M** et al (2023). Thousands of *Pristionchus pacificus* orphan genes were integrated into developmental networks that respond to diverse environmental microbiota. *PLoS Genetics* 19(7): e1010832.
5. Wighard SS, **Athanasouli M** et al (2022). A New Hope: A Hermaphroditic Nematode Enables Analysis of a Recent Whole Genome Duplication Event. *Genome Biology and Evolution* 14: evac169.
6. **Athanasouli M** and Rödelberger C (2022). Analysis of repeat elements in the *Pristionchus pacificus* genome reveals an ancient invasion by horizontally transferred transposons. *BMC Genomics* 23, 523.
7. **Athanasouli M** et al (2020). Comparative genomics and community curation further improve gene annotations in the nematode *Pristionchus pacificus*. *BMC Genomics* 21, 708.
8. Rödelberger C, **Athanasouli M**, et al (2019). Crowdsourcing and the feasibility of manual gene annotation: A pilot study in the nematode *Pristionchus pacificus*. *Scientific Reports* 9: 1-9.