



Andrea Villani

Date of birth: 03/04/1994 | **Nationality:** Italian | **Gender:** Male | **Phone number:**

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WORK EXPERIENCE

01/11/2023 – CURRENT Roma, Italy

BIOINFORMATICS RESEARCHER IRCSS CASA SOLLIEVO DELLA SOFFERENZA - MENDEL BIOINFORMATICS UNIT

Pipeline development for synonymous variants interpretation on RNA's secondary structures. Interpretation of the role of variants of unknown significance (VUS) on protein structures and energy through Molecular Modeling and Molecular Dynamics (MD) simulations techniques. Next-Generation Sequencing (NGS) genomic data analysis. Scientific virtual reality experiences creation.

Research interests:

- *Bioinformatics and Genomics;*
- *Molecular Modeling and Molecular Dynamics (MD) simulations techniques;*
- *Big data & Scientific programming;*
- *High Performance Computing (HPC) - Experience using HPC cluster (Leonardo);*

01/2021 – 10/2023 Roma, Italy

BIOINFORMATICIAN BAMBINO GESÙ CHILDREN HOSPITAL - MEDICAL GENETICS UNIT

Next-Generation Sequencing (NGS) genomic data analysis. Handling patient's case data from medical genetics database.

- *Bioinformatics and Genomics;*
- *Structural bioinformatics;*
- *Pharmacogenetics Web Tool Development;*
- *Development, characterization, and validation of predictive tests for genetic susceptibility to COVID-19;*

09/2019 – 07/2020 Roma, Italy

MASTER DEGREE INTERNSHIP IRCSS CASA SOLLIEVO DELLA SOFFERENZA - MENDEL BIOINFORMATICS UNIT

Project: *Non-small cell lung cancer NGS data analysis: characterization of the mutational spectrum of the Italian population*

09/2016 – 12/2016 Anguillara Sabazia (RM), Italy

BACHELOR DEGREE INTERNSHIP ENEA - CASACCIA

Project: *BIOxTREME: plant factories for bioactive molecules formulation with microbicidal, immunostimulating, and antioxidant activity for extreme conditions life*

EDUCATION AND TRAINING

01/11/2023 – CURRENT Roma, Italy

PHD STUDENT Sapienza, University of Rome

Medical Genetics and Human Biology - PNRR funded

10/2017 – 07/2020 Roma, Italy

MASTER DEGREE IN BIOINFORMATICS University of Rome Tor Vergata

Thesis: *Non-small cell lung cancer NGS data analysis: characterization of the mutational spectrum of the Italian population*

Thesis: *Prebiotic synthesis of nucleotides*

● **LANGUAGE SKILLS**

Mother tongue(s): **ITALIAN**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	B2	B2	B2	B2	C1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

● **DIGITAL SKILLS**

Digital Skills - Test Results

 Information and data literacy	ADVANCED	Level 5 / 6
 Communication and collaboration	ADVANCED	Level 6 / 6
 Digital content creation	ADVANCED	Level 6 / 6
 Safety	ADVANCED	Level 6 / 6
 Problem solving	ADVANCED	Level 6 / 6

Results from [self-assessment](#) based on [The Digital Competence Framework 2.1](#)

My Digital Skills

Programming Languages

Python | Bash

Molecular Modeling and Molecular Dynamics Simulations

PyMOL Molecular Graphics System | UCSF Chimera | UCSF ChimeraX | AlphaFold2 | GROMACS | AMBER

NGS Data Analysis

SAMtools | NGS variant analysis (GATK)

OS and Coding Environments

Linux Ubuntu | Windows | Conda environments

Database

MySQL | MongoDB

Virtual Platforms Development

Unity

Clouds

Illumina BaseSpace | AWS

Versioning Control Systems

GIT version control, Linux Command

Workflow Management Systems

SnakeMake

HPC Computing

Slurm | Leonardo

Office Suite

Microsoft Office (Outlook, Excel, Word, PowerPoint)

Web Development and Design

CSS | PHP | HTML | Bootstrap | Django Web Framework | Streamlit

Data Science

Pandas | Numpy | Matplotlib | Scikit-Learn

● PUBLICATIONS

2022

Expanding the novel MAPKAPK5-related developmental disorder's genotype-phenotype correlation: Patient report and 19 months of follow-up

Vecchio D, Cocciadiferro D, Macchiaiolo M, Gonfiantini MV, Agolini E, Matraxia M, Carboni A, Coretti A, **Villani A**, Panfili FM, Dentici ML, Buonuomo PS, Rana I, Colafati GS, Digilio MC, Novelli A, Bartuli A
Clinical Genetics. 2022;102:142-148.
DOI: 10.1111/cge.14150
PMID: 35575217

2024

Exploiting in silico structural analysis to introduce emerging genotype-phenotype correlations in DHCR24-related sterol biosynthesis disorder: a case study

Cocciadiferro D, Mazza T, Vecchio D, Biagini T, Petrizzelli F, Agolini E, **Villani A**, Minervino D, Martinelli D, Rizzo C, Boenzi S, Panfili FM, Buonuomo PS, Macchiaiolo M, Bartuli A, Novelli A
Front. Genet. 14:1307934.
doi: 10.3389/fgene.2023.1307934
PMID: 38239854

● CONFERENCES AND SEMINARS

29/03/2023 Roma

Evolution, challenges and new opportunities of therapeutic drug monitoring

Position: *Speaker*

Title: *Role of Next Generation Sequencing in pharmacogenetics and software development for the analysis of results*

2023 Rimini

SIGU 2023, Rimini - Società Italiana di Genetica Umana

Position: *Author*

Poster: *Bioinformatics Analysis and identification of two novel SOX11 variants in a patient with a Coffin-Siris syndrome-like phenotype*

2023 Washington

ASHG 2023, Washington - American Society Human Genetics

Position: *Author*

Poster: *Expanding the rare DHCR24-related sterol biosynthesis disorder: genotype-phenotype correlation*

2024 Roma

HUGO 2024, Roma - Human Genome Meeting

Position: *Author*

PROJECTS

01/2024 – CURRENT

VRare - Terza Missione Sapienza

VRare - FROM VERY RARE TO VERY REAL: A journey to the discovery of neurodevelopmental diseases

Terza Missione, Sapienza

The initiative proposes an educational Virtual Reality pathway for secondary schools focused on rare genetic diseases, exploring the molecular bases of diseases, manipulate DNA and molecules, conduct "in silico" experiments, and interact with patients and experts. The goal is to improve education, raise public awareness, and promote innovation in research. The project, coordinated by Sapienza University with contributions from the CSS-Mendel Institute and the Bambino Gesù Pediatric Hospital, includes phases of information gathering, technological development, presentations in schools, and a final sharing event.

TEACHING SKILLS

CURRENT

VRare - Terza Missione Sapienza

VRare - FROM VERY RARE TO VERY REAL: A journey to the discovery of neurodevelopmental diseases description

COMMUNICATION AND INTERPERSONAL SKILLS

Problem-solving

Coding: *I have developed excellent coding skills and enthusiasm for tackling challenging problems. I always try to tackle complex issues to enhance my coding proficiency and write increasingly efficient code. I always use several package and modules offered by programming languages to optimize solutions and results.*

Data Analysis and Presentation: *My experience span a diverse range of data types, with a particular focus on genomic data analysis and interpretation. When presenting my findings I am always focused on each detail to ensure my results and studies are clear and impactful for audiences.*

Scientific Collaboration

Work ethic: *I approach everyday with enthusiasm for learning and contributing to my team and to new projects and experiences in order to grow personally and professionally, as well as to enhance my personal skills and knowledge.*

REFERENCES

Dr. Tommaso Mazza

IRCCS Casa Sollievo della Sofferenza
e-mail: t.mazza@operapadrepio.it

DRIVING LICENCE

Driving Licence: B

PERSONAL DATA

I hereby authorize the treatment of my personal data according to Italian Legislative Decree n. 196/2003 Regulation (EU) GDPR n.679/2016.
