Francesca Brunetti

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Personal website: https://francii-b.github.io/

Date of birth: 5 Jan 1998   **Nationality:** Italian

EDUCATION AND TRAINING

[Nov 2022 – Current]

Ph.D. student in Infectious Diseases, Microbiology, Legal Medicine and Public Health Sciences

Sapienza University of Rome

City: Rome | **Country:** Italy |

38th Ph.D. cycle

Thesis Title (provisional) : Optimized *k*-mer Matching For Million-Genome Collections On Laptops

Supervisor: Prof. Maria Pia Conte

Co-Supervisor: Dr. Karel Břinda

Venue: Computational Microbiology Lab (Microbiology section), Department of Public Health and Infectious Diseases, Sapienza University of Rome

[Sep 2020 – Jul 2022]

MSc in Bioinformatics

Tor Vergata University of Rome

City: Rome | **Country:** Italy | | **Final grade:** 110 with honours / 110

Thesis project: "*Genotypic characterization of Staphylococcus aureus strains from patients affected by atopic dermatitis*"

Thesis Advisors: prof. Maria Pia Conte, Dr. Massimiliano Marazzato

Thesis Internship duration: 9 months (October 2021 - July 2022)

Venue: Computational Microbiology Lab (Microbiology section), Department of Public Health and Infectious Diseases, Sapienza University of Rome

Area: Genomics, Microbiology

[Sep 2016 – Oct 2019]

BSc in Bioinformatics

Sapienza University of Rome

City: Rome | **Country:** Italy | | **Final grade:** 110 with honors / 110

Thesis project: "*Characterization of the Nasal Microbiota in children with chronic nasal inflammation: role of adenoid hypertrophy and allergic rhinitis*"

Thesis Advisors: prof. Maria Pia Conte, Dr. Massimiliano Marazzato

Thesis Internship duration: 6 months (May - October 2019)

Venue: Computational Microbiology Lab (Microbiology section), Department of Public Health and Infectious Diseases, Sapienza University of Rome

Area: Metagenomics, Microbiology

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BSc entirely held in English.

PHD EXPERIENCE - RESEARCH PERIOD ABROAD

[Nov 2023 – Nov 2024]

Research period at INRIA centre at Rennes University

Supervisor: Dr. Karel Brinda (Genscale team)

Institute: INRIA centre at Rennes University, Rennes (France)

Activities:

- Tackling the challenge of comprehensive and rapid searchability across publicly available sequencing data, scaling such searches to portable devices for biological applications
- Definition of a methodology for k-mer search across million-genome bacterial collections on portable devices using phylogenetic compression, to address specific biological questions.

GRANTS

[Nov 2023 – Jan 2024]   **PhD students mobility grant - D.R. 1505/2023**

Funding institution: Sapienza University of Rome

Duration: 3 months (November 2023 - January 2024)

Host institution: INRIA centre at Rennes University, Rennes (France)

Supervisor: Dr. Karel Brinda (Genscale team)

Details about the activity can be found in the 'PhD Experience – Research Period Abroad' section.

[Nov 2023 – Nov 2024]   **"Avvio alla ricerca" research grant - D.R. 1074/2023**

Funding institution: Sapienza University of Rome

Duration: 1 years (November 2023 - November 2024)

Brief description: Definition of pangenome-based workflow for identifying potential discriminatory markers for the individual species belonging to the BCC, leveraging all available genomes in public databases.

[Jun 2021 – Oct 2021]   **Undergraduate research grant**

Funding institution: Sapienza University of Rome

Duration: 6 months (May - October 2021)

Supervisor: prof. Anna Teresa Palamara

Venue: Computational Microbiology Lab (Microbiology section), Department of Public Health and Infecious Disease, Sapienza University of Rome

Activities: Application of bioinformatic techniques for the analysis of microbial organisms.

Gained Experience: NGS analyses starting from raw data; Genome assembly; Characterization of single microorganisms (WGS analysis) or/and microbial communities (16S Metagenomics analysis); Comparative genomics; Pangenomics analysis.

UNDERGRADUATE RESEARCH EXPERIENCE

[Jan 2020 – Apr 2021]   **Training Experience in Computational Microbiology**

Venue: Computational Microbiology Lab (Microbiology section), Department of Public Health and Infecious Disease, Sapienza University of Rome

Tutor: Dr. Massimiliano Marazzato

Themes: Application of bioinformatic techniques for the analysis of microbial organisms.

Gained Experience: NGS analyses starting from raw data; Genome assembly; Characterization of single microorganisms (WGS analysis) or/and microbial communities (16S Metagenomics analysis); Comparative genomics; Pangenomics analysis.

PUBLICATIONS

[2024]   **Women Skin Microbiota Modifications during Pregnancy**

https://doi.org/10.3390/microorganisms12040808

Microorganisms

Giulia Radocchia[†], **Francesca Brunetti**[†], Massimiliano Marazzato, Valentina Totino, Bruna Neroni, Giulia Bonfiglio, Antonietta Lucia Conte, Fabrizio Pantanella, Paola Ciolli, Serena Schippa

[†]These authors share first authorship

[2023] **XIV Seminar - PhD Day. Eppur si muovono: does people mobility enhance global health? Organized by the Italian National Institute of Health and Sapienza University of Rome. November 6, 2023 Abstract book**

Roma: Istituto Superiore di Sanità, 2023 (ISTISAN Congressi 23/C5)

Abstract book - Edited by Stefania Bocci, **Francesca Brunetti**, Claudia Chiovoloni and Luca Maddaloni

[2023] **Atopic dermatitis-derived Staphylococcus aureus strains: what makes them special in the interplay with the host**

https://doi.org/10.3389/fcimb.2023.1194254

Frontiers in Cellular and Infection Microbiology, 13:1194254

Antonietta Lucia Conte[†], **Francesca Brunetti**[†], Massimiliano Marazzato, Catia Longhi, Linda Maurizi, Giammarco Raponi, Anna Teresa Palamara, Sara Grassi, Maria Pia Conte

[†]These authors share first authorship

[2023] **Genotypic and Phenotypic Characterization of Escherichia coli Isolates Recovered from the Uterus of Mares with Fertility Problems**

https://doi.org/10.3390/ani13101639

Animals (Basel), 13(10):1639

Francesca Paola Nocera, Linda Maurizi, Angelo Masullo, Mauro Nicoletti, Antonietta Lucia Conte, **Francesca Brunetti**, Luisa De Martino, Carlo Zagaglia, Catia Longhi

[2022] **Allergic rhinitis, microbiota and passive smoke in children: A pilot study**

https://doi.org/10.1111/pai.13621

Pediatric Allergy and Immunology, 33 Suppl 27(Suppl 27):22-26

Giulia Brindisi, Massimiliano Marazzato, **Francesca Brunetti**, Giovanna De Castro, Lorenzo Loffredo, Roberto Carnevale, Bianca Cinicola, Anna Teresa Palamara, Maria Pia Conte, Anna Maria Zicari

[2022] **Genetic Diversity of Antimicrobial Resistance and Key Virulence Features in Two Extensively Drug-Resistant Acinetobacter baumannii Isolates**

https://doi.org/10.3390/ijerph19052870

International Journal of Environmental Research and Public Health, 19(5):2870

Massimiliano Marazzato, Daniela Scribano, Meysam Sarshar, **Francesca Brunetti**, Silvia Fillo, Antonella Fortunato, Florigio Lista, Anna Teresa Palamara, Carlo Zagaglia, Cecilia Ambrosi

CONFERENCES AND SEMINARS

[6 Mar 2025] **Oral presentation at DSB 2025**   Pisa, Italy

Role: Speaker

Event: DSB 2025

Title: "*Optimized K-mer Matching For Million-Genome Collections On Laptops*"

Language: English

[29 Nov 2024] **Oral presentation at SeqBIM 2024**   Rennes, France

Role: Speaker

Event: [SeqBIM 2024](#)

Title: "*Optimized K-mer Matching For Million-Genome Collections On Laptops*"

Language: English

Link to the abstract: https://inria.hal.science/hal-04842871/document

[22 Feb 2024]   **Poster presentation at DKM Department Days**   Rennes

Role: Poster presenter

Event: Annual meeting of the department of Data and Knowledge management ([DKM](#)), Institut de Recherche en Informatique et Systèmes Aléatoires ([IRISA](#))

Title: "*High-throughput bacterial epidemiology with global phylogenetically compressed genomic indexes*"

Language: English

[6 Nov 2023]   **Scientific staff / Chair at PhD Day 2023**   Rome, Italy

Role: Scientific staff / Chair

Event: PhD Day 2023 (XIV edition) - "*Eppur si muovono: does people mobility enhance global health?*"

Organizers: Italian National Institute of Health and Sapienza University of Rome

Theme: The PhD Day represents a traditional event in the activities of the PhD in Advances in infectious diseases, microbiology, legal medicine and public health sciences. The focus of this edition will be on how movements of people and animals have shaped the evolution and actual distribution of human populations, impacted global health, as well as represented the primordial and actual answer to the need of freedom.

[22 Sep 2023 – 24 Sep 2023]   **Oral presentation at ICBRA 2023**   Barcellona, Spain

Role: Speaker

Event: 10th International Conference on Bioinformatics Research and Applications ([ICBRA](#) 2023)

Title: "*Accurate differentiation of Burkholderia cepacia complex species: an updated pangenomic study*"

Theme:

-Introduction to the *Burkholderia cepacia* complex (BCC) and the issues associated with their identification.

-Description of our research work concerning the development of a novel identification strategy for BCC species

Language: English

[13 Jul 2023]   **Oral presentation at Inria Centre at Rennes University**   Rennes, France

Role: Speaker

Event: Symbiose seminar held at INRIA Centre at Rennes University (GenScale)

Title: "*Atopic dermatitis-derived Staphylococcus aureus strains: what makes them special in the interplay with the host*"

Theme: Presentation of our recent research work concerning the genomic characterization of *S. aureus* strains isolated from atopic dermatitis patients

Language: English

[25 May 2023]   **Attendance at national conference**   Rome, Italy

Role: Attendee

Event: 1st Conference on Artificial and Natural Intelligence ("*1° Convegno su Intelligenza Artificiale e Naturale*", [IAN 2023](#))

Themes: Novel applications of Artificial Intelligence (AI) and ethical considerations

Language: English

Organizers: Advanced School in Artificial Intelligence and AI2Life

[Nov 2022 – Dec 2022] **Attendance at seminar**

Role: Attendee

Event: Virtual seminar series "Sapienza soft skills training for young researchers"

Themes:

-Scientific calculation tools and Big data

-Research data management and storage

Language: Italian/English

[10 Nov 2019] **Invited Talk**   Rome, Italy

Role: Invited Speaker

Event: Seminar series held for the Bioethics students (a.y. 2019-2020), BSc in Bioinformatics, Sapienza University of Rome

Title: "*Mitochondrial donation, why not?*"

Theme: Ethical evaluation of mithocondrial donation techniques

Language: English

Organizer: Elisabetta Sirgiovanni, Assistant Professor

PEER REVIEW ACTIVITIES

[May 2023 – Current] **Peer reviewer for Ecotoxicology and Environmental Safety**

[Dec 2023 – Current] **Peer reviewer for PLOS Computational Biology**

SUPPLEMENTARY TEACH-ING ACTIVITIES

[Nov 2022 – Current] **Laboratory sessions for Dentistry and Dental Prosthodontics students**

Theme: Introduction to Computational microbiology and its applications

Activity: Laboratory sessions held for the students from the "*Microbiology and Hygiene*" course (MED/07), MSc in Dentistry and Dental Prosthodontics, Sapienza University of Rome

Course teacher: Prof. Maria Pia Conte, Associate professor

[Nov 2022 – Current] **Laboratory sessions for Biotechnology students**

Theme: Introduction to Computational microbiology and its applications

Activity: Laboratory sessions held for the students from the "*General microbiology, microbial biotechnology and elements of medical microbiology I*" course (MED/07), BSc in Biotechnology, Sapienza University of Rome

Course teacher: Prof. Catia Longhi, Associate professor

PROJECTS

[Jan 2021 – Jun 2021] **MSc Bioinformatics website development**

Aim: Development of the new official website for the MSc in Bioinformatics, Tor Vergata University of Rome.

Supervisor: prof. Andrea Cabibbo, Tor Vergata University of Rome

LANGUAGE SKILLS

Mother tongue(s): Italian

Other language(s):

English

LISTENING C1 **READING** C1 **WRITING** C1

SPOKEN PRODUCTION C1 **SPOKEN INTERACTION** C1

French

LISTENING B1 **READING** B1 **WRITING** B1

SPOKEN PRODUCTION B1 **SPOKEN INTERACTION** B1

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

SKILLS

Expertise

Bioinformatics | Data analysis | Statistical Analyses | k-mer based methods | Data structures | Microbiology | Bacteriology

Omics expertise

Genomics | Metagenomics | Pangenomics | Transcriptmics

Programming and Markup languages

R | Python | Bash programming | C | C++ | LaTeX | Ruby | HTML, CSS & PHP | SQL

Operating systems

Linux Environment | Microsoft Windows | Mac environments

Other technical skills

Workflow, Queue and Package Management (Snakemake, Conda, Slurm) | Version Control (Git) | Cluster Computing | Data Collection, Data Cleaning, Data Analysis, Data Visualisations | Microsoft Office | Libre Office | Machine Learning

Soft skills

Emotional inteligence | Teamwork and collaboration | Problem-Solving and Critical Thinking | Active Listening and Communication | Presentation Skills | Leadership and management | Adaptability and Resilience