



Omics & Heritage Workshop

May 14-15, 2024 - Rome, Italy



SAPIENZA
UNIVERSITÀ DI ROMA



Consiglio Nazionale
delle Ricerche

Sala Marconi, CNR
Piazzale Aldo Moro, 7 - 00185 Rome

Metagenomes and Microbiomes for the study of Cultural Heritage Conservation and Archaeology



www.omicsheritage2024.org
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Sponsors

Applied
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International Biodeterioration & Biodegradation Society

Patronage



Organizers

Flavia Pinzari

Institute for Biological Systems (IBS), National Research Council of Italy (CNR), Rome

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Dept. of Biology and Biotechnologies Charles Darwin, Sapienza University of Rome

Massimo Reverberi

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Carmelo Cannarella

Institute for Biological Systems (IBS), National Research Council of Italy (CNR), Rome

Programme Tuesday, 14 May 2024

13:00-13:30 Registration

Aula Marconi, National Research Council of Italy (CNR), Piazzale Aldo Moro, 7 Roma

13:30-14:00 Welcome Address

Zeineb Aturki, Flavia Pinzari

Institute for Biological Systems (IBS), National Research Council of Italy (CNR)

Teresa Rinaldi

Dept. of Biology and Biotechnologies Charles Darwin, Sapienza University of Rome

Massimo Reverberi

Dept. of Environmental Biology, Sapienza University of Rome

14:00-14:30 Keynote Speaker

Matthew Collins

Department of Archaeology, University of Cambridge

Museum of Natural History, University of Copenhagen

"Skin deep? What can we learn about manuscripts from analysing their biomolecular record?"

14:30-15:10 Session I: Metagenomics and Metabolomics for Archeology

(Chairs: M.Collins and M.Beccaccioli)

Alessia Monticone

"Omics at the Musei Reali di Torino. Zooarchaeology by Mass Spectrometry (ZooMS) for taxonomic identification of osseous objects and the detection of restoration glues from legacy collections"

Ylenia Vassallo

"Nanopore sequencing for biocodicology: a new strategy to study DNA in parchment material"

15:10-15:50 Coffee break

15:50-16:50 Session II: Molecular and Microbiological Methods in Preservation of Cultural Heritage

(Chairs: T.Rinaldi and Y.Vassallo)

Cristina Cattò

"Selection and identification of indigenous microorganisms living on spray painted surfaces to be used for cleaning graffiti"

Adele Bosi

"PARCA project - advance in proteomics and analysis of dyes and recovery of charred and aged textiles"

Patrycja Petrasz

"A novel mechanism for archaeological iron conservation using dead biomass of the yeast *Meyerozyma* sp."

16:50-17:20 Invited Speaker

Allegra Via

ELIXIR Italy Training Coordinator

Dept. of Biochemical Sciences "A. Rossi Fanelli"

Presentation of the Italian Node of ELIXIR | A distributed infrastructure for life-science information



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Programme Tuesday, 14 May 2024

17:20-18:00 Flash talks

Marco Curione

"A proposal for a green selective chemical cleaning method of paper artifacts"

Luigi Faino

"Advantages in applying long reads metabarcoding in cultural heritage conservation"

Giulia Gasperuzzo

"Extraction and characterization of microalgae-based polysaccharides and protein mixture: potential and innovative material for paper conservation"

Matilde Kratter

"Evaluation of biodeterioration in the UNESCO site Etruscan Necropolis of Tarquinia"

Syeda Fatima Manzelat

"Biodeterioration and Biodegradation of Historic Parks of UK by Algae"

Franco Palla

"Integrated approach to Identify and Counteract Microbial Biodeterioration of cultural asset"

Maria-Antonietta Buccheri

"Microbial communities inhabiting deteriorated frescoes: a metagenomic approach to the case of Santa Maria della Grotta"

18:00-19:00 Poster Session & Drinks

Gypsoteca, Department of Classics (CU003)

Sapienza University of Rome, Piazzale Aldo Moro, 5 Rome

19:00-21:00 Dinner

Gypsoteca, Department of Classics (CU003)

Sapienza University of Rome, Piazzale Aldo Moro, 5 Rome



Programme Wednesday, 15 May 2024

09:00-09:15 Institutional greetings

Invited Speaker

Costanza Miliani

Director of the CNR-ISPC (Institute of Heritage Science)

“E-RIHS - The European Research Infrastructure for Heritage Science”

09:15-09:30 Introduction to sponsors

Flavia Pinzari

The International Biodeterioration and Biodegradation Society (IBBS)

The Journal for Applied Microbiology (JAM) and the Applied Microbiology International Society (AMI)

Sara Envimob Srl

09:30-10:00 Keynote Speaker

Guadalupe Piñar

Institute for Natural Sciences and Technology in the Arts, Academy of Fine Arts Vienna

“Omic analyses using Nanopore technology applied to the conservation and monitoring of cultural heritage: is this the future?”

10:00-11:00 Session III: Metagenomics and Metabolomics for Heritage Conservation

(Chairs: G.Piñar and M.Beccaccioli)

Chiara Alisi

“Unveiling the microbial hazard: exploring biofilm composition on Casino Algardi for conservation insight”

Domenico Celi

“Microbiological air monitoring and biodeterioration risk in the Cathedral of Santa Maria del Fiore”

Brunella Cipolletta

“Binder-pigment interaction by proteomic approaches”

11:10-11:30 Coffee break

11:30-13:10 Session IV: New and Green Molecules in Preservation of Cultural Heritage

(Chair: F.Pinzari and L.Pin)

Luis Fernandes

“Analysis of the fungal communities contaminating museum collections and the fungicidal effects of hydrodistilled plant essential oils: a case study in the Science Museum of the University Coimbra”

Jelena Pavlovic

“MinION sequencing: taxonomical and functional genes identification of microbiota colonizing cultural heritage objects”

Roberta Ranaldi

“New conservation techniques based on essential oils encapsulated in an alginate hydrogel system to counteract biofilm growth in the Colosseum Arena”



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Programme Wednesday, 15 May 2024

11:30-13:10 **Session IV: New and Green Molecules in Preservation of Cultural Heritage**
(Chair: F.Pinzari and L.Pin)

Filippo Pasquale Riggio

“Carotenoid-producing Actinomycetota associated with pink patinas on ancient mural paintings”

Brunella Perito

“Essential oils to control microbial growth on the external marble of Florence Cathedral”

13:10-13:20 **Announcement of award winners for best poster, presentation and flash talk**

13:20-13:30 **Conclusions and Future Perspectives**



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Posters

- Francesca Benedetti** Structural study of carbonic anhydrases for bioconsolidation applications
- Beatrice D'Orsi** Gamma Radiation Effects on Cultural Heritage Artifacts at Calliope Facility (ENEA Casaccia R. C., Rome, Italy)
- Amela Kujović** Transcriptome sequencing of xerotolerant fungus *Aspergillus puulaaensis* growing on restoration materials Lascaux acrylic glue 498 and Regalrez 1094
- Maria Landolfi** In Living Color: exploring the correlation between taxonomic and functional properties of subaerial biofilms and their color
- Alessia Marzanni** Bridging the Gap: Exploring the Relationship Between Biological and Physical Properties of Biofilms on Stone Monuments
- Pink and salty: Exploring the inter-kingdom ecological networks within pink biofilms thriving on salt-weathered lithic substrates
- Candida Moffa** Terahertz spectroscopy: a complementary approach for Cultural Heritage conservation
- Emilia Pereira** Identification of contaminating fungi of taxidermized animals of the Science Museum of the University of Coimbra
- Lorenzo Pin** Unveiling microbial communities and material interactions in museum collections: a multi-technique approach using DNA metabarcoding and electron microscopy
- Lorenza Rugnini** From 10% to 0.1% of phyto-derivatives concentration in five years of application in cultural heritage: how much is the effectiveness of these biocides?
- Flavia Tasso** Removal of peg from waterlogged archaeological wood by a bacteria consortium
- Palona Zalar** Fungal microbiome on deteriorated historic paintings



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