



HOLOGENOME

Sao Paulo School of Advanced Science 2024

São Paulo School of Advanced Science on Hologenomic Data Analysis For Agriculture

July 29th to August 09th, 2024 - São Carlos, SP, Brazil

Coordinators:

Luciana Correia de Almeida Regitano - Embrapa Pecuária Sudeste

Luiz Alberto Colnago - Embrapa Instrumentação

Daniel Rodrigues Cardoso - IQSC - USP

Duration: 75 hours

29,0 hours of lectures, research results and post-graduation programs

19,5 hours of practical classes

05,5 hours of poster and seminar presentation, and plenary discussion

09,5 hours of general discussion (including coffee break), evaluation and closing

11,5 hours of technical visits

The lectures and abstract presentations on the first three days (July 29th to 31st) will be open to the scientific public (limited to the auditorium capacity). The event will be held in English.

PROGRAM

WEEK 1: July 29th to August 02th, 2024

07/29/2024 (Monday)

Embrapa Instrumentation

08:00-08:30am	Welcome Section - Organizing Committee
08:30-9:30am	FAPESP: Purposes and programs - FAPESP
9:30-10:30am	Opening lecture: The language of life - Haithem Afli - Munster Technological University

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10:30-11:00	Coffee break
11:00-12:00am	Bifidobacteria in the mammalian tree of life - Francesca Botaccini - Munster Technological University
12:00-01:40pm	Lunch interval
01:40-02:40pm	Modeling microbiome in genomic selection - Daniela Lourenco - University of Georgia
02:40-03:40pm	Omics-based nutrition to improve cattle production sustainability - Leluo Guan - University of Alberta
03:40-04:10pm	Coffee break
04:10-04:30pm	Sponsor's presentation
04:30-05:30pm	4 Oral presentations

07/30/2024 (Tuesday)	
Embrapa Instrumentation	
08:00-09:00am	Unraveling the Nelore hologenome - Luciana Correia de Almeida Regitano - Embrapa Pecuária Sudeste, São Carlos, São Paulo, Brazil
9:00 - 10:00am	Using Microbiome Information in the Context of Animal Sciences - Jeferson Lourenco - University of Georgia
10:00-10:30am	Coffee break
10:30-10:50am	Sponsor's presentation
10:50-11:50am	Microbiome vs fatty acids and production traits in pigs - Aline Cesar - ESALQ/USP
12:00-01:50pm	Lunch interval
01:50-02:50pm	Holobionts, a new view to improve the use of microorganisms in sustainable agriculture - Maria Carolina Quecine Verdi - ESALQ/USP
02:50-03:50pm	Capybara harbors unprecedented enzymatic systems to degrade plant polysaccharides - Lucelia Cabral - University of Brasilia (UnB)
03:50-04:20pm	Coffee break
04:20-04:30pm	Sponsor's presentation
04:30-05:30pm	4 oral presentations
05:30-09:30pm	Happy hour

07/31/2024 (Wednesday)	
Embrapa Instrumentation	
08:00-09:00am	Integrating multi-omics data using multilayer networks for the analysis of the rumen microbiome - Huiru Zheng - Ulster University
09:00-10:00am	Metabolomics as a powerful tool for phenotype selection and nutritional evaluation in animal interventional studies - Daniel Rodrigues Cardoso - USP/São Carlos
10:00-10:30am	Coffee break
10:30-12:00pm	Poster presentation
12:00-02:00pm	Lunch interval
02:00-05:00pm	Technical Visit - Embrapa Pecuária Sudeste

08/01/2024 (Thursday)	
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	Course: Microbiome Data Analysis - Francesca Bottacini
08:00-09:30am	Introduction to the Microbiome field, challenges and opportunities
09:30-10:00am	Coffee break
10:00-12:00pm	State of the art, methods and discussion
12:00-02:00pm	Lunch interval
02:00-06:00pm	Practical labs - Microbiome Data Analysis

	08/02/2024 (Friday)
	IQSC USP/ São Carlos
	Course: Data Analysis for Biotechnology with Python - Bruno Andrade
08:00-09:30am	Python Crash course - basics and data types
09:30-10:00am	Coffee break
10:00-12:00pm	Decision and iteration structures Functions and Libraries
12:00-02:00pm	Lunch interval
02:00-05:00pm	Visualisation using matplotlib and Plotly Compositional Data Analysis with Python

	WEEK 2: August 05th to 09th, 2024
	08/05/2024 (Monday)
	IQSC USP/ São Carlos
	Course: Machine/deep Learning, NLP and transformers for Biotechnology - Haithem
08:00-09:30am	Introduction - AI fundamentals NLP fundamentals Current and future applications in the Computational Biology field
09:30-10:00am	Coffee break
10:00-12:00pm	State of the art, methods and discussion
12:00-02:00pm	Lunch interval
02:00-04:00pm	Practical labs - Machine/deep Learning
04:00-04:30pm	Coffee break
04:30-6:30pm	Practical labs - NLP and transformers for Biotechnology

	08/06/2024 (Tuesday)
	IQSC USP/ São Carlos
	Course: Host and microbiome multi-omics integration: applications and methodologies - Aline Cesar, Juliana Afonso and Jennifer Jessica Bruscadin.
08:00-09:10am	Introduction Omics data host & Meta-omics
09:10-09:30am	Sponsor's presentation
09:30-10:00am	Coffee break
10:00-12:00pm	Integrating the metagenome and host genome: Analytical methodologies
12:00-02:00pm	Lunch interval
02:00-03:40pm	Practical labs - Multi-omics integration
03:40-04:00pm	Sponsor's presentation

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04:00-04:30pm	Coffee break
04:30-6:30pm	Practical labs - Multi-omics integration

08/07/2024 (Wednesday)	
Embrapa Instrumentation	
08:00-09:10am	Lecture: Metabolomics and principals on metabolomic data collection - Luiz Alberto Colnago
09:10-09:30am	Sponsor's presentation
09:30-10:00am	Coffee break
10:00-12:00pm	Technical Visit to Embrapa Instrumentação
12:00-02:00pm	Lunch
02:00-05:00pm	Technical Visit to USP/São Carlos Labs

08/08/2024 (Thursday)	
IQSC USP/ São Carlos	
Course: How to use friendly softwares for analyzing metabolomics data (MetaboAnalyst and GraphPrism) - Banny Silva Barbosa Correia	
08:00-08:30am	Introduction
08:30-09:30am	Metaboanalyst software introduction
09:30-10:00am	Coffee-break
10:00-12:00pm	Exercise 1 - Multivariate analysis
12:00-02:00pm	Lunch interval
02:00-02:30pm	Graph Prism software introduction
02:30-04:30pm	Exercise 2 - Univariate analysis
04:30-05:00pm	Coffee break
05:00-06:30pm	Exercise 3 - Adventure race

08/09/2024 (Friday)	
Embrapa Instrumentation	
08:00-12:00pm	Technical visit - UFSCar (Genetic and Biotechnology Departments)
12:00-02:00pm	Lunch interval
02:00-03:00pm	Research lines and main results obtained at Embrapa Pecuária Sudeste, São Carlos, SP - Luciana Correia de Almeida Regitano - Embrapa Pecuária Sudeste, São Carlos, SP, Brazil
03:00-03:20pm	Research at the Chemistry Institute of São Carlos, University of São Paulo, São Carlos, SP - Daniel R Cardoso
03:20-03:40pm	Post-graduation programs at Escola Superior de Agricultura Luiz de Queiroz, Universidade de São Paulo, Piracicaba, SP - Aline Cesar
03:40-04:00pm	Post-graduation programs at Universidade Federal de São Carlos, São Carlos, SP - Luciana Correia de Almeida Regitano
04:00-04:30pm	Coffee break
04:30-05:30pm	Closing Section: General discussion and Course evaluation

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