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## UNDER THE AUSPICES OF

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IASLC International Association for the Study of Lung Cancer

AIOM Associazione Italiana Oncologia Medica

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I3LUNG

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2nd edition

# ARTIFICIAL INTELLIGENCE FOR ONCOLOGY

PRESIDENT OF THE CONFERENCE
**ARSELA PRELAJ**

MILAN, ITALY
MAY 10th 2024
& ONLINE

Fondazione IRCCS Istituto Nazionale dei Tumori

Sistema Socio Sanitario
Regione Lombardia

POLITECNICO MILANO 1863

## PRESIDENT OF THE CONFERENCE

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Member of the ESMO Working Group on Real World Data and Digital Health

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**Filippo de Braud**, Fondazione IRCCS Istituto Nazionale Tumori, Milano

**Alessandra Pedrocchi, Francesco Trovò, Vanja Miskovic**
Politecnico di Milano, DEIB

## SCIENTIFIC SECRETARIAT

**Giovanni Scoazec, Leonardo Provenzano**
Fondazione IRCCS Istituto Nazionale Tumori, Milano

# General Information

## CONGRESS VENUE

**Aula Magna,** ***Fondazione IRCCS Istituto Nazionale Tumori***
Via Giacomo Venezian, 1 20133 Milano

## VIRTUAL CONFERENCE

https://www.events-fad.com/

## REGISTRATION

Registration is free of charge.
You may register for IN-PERSON OR ONLINE-ONLY ACCESS
www.events-communication.com/event/ai2024

## OFFICIAL LANGUAGE AND TIME

The official language is English
The official Time is Central European Summer Time (CEST), UTC +2

## CME CREDITS

CME accreditation (valid for Italian participants only) for: Medical Doctor, Chemist, Pharmacist, Biologist, Physician, Nurse.
CME credits RES: 4,9 - CME credits FAD: 10,5
Italian CME credits will be granted to those participants who attend at least 90% of scientific works, fill in the questionnaire assessment of perceived quality and duly fill in the evaluation questionnaires answering correctly 75% of the questions.

# Overview

AI methodologies have been applied to medical research for years, and have recently made an impactful entrance in oncology more specifically. AI broadly speaking consists in a set of techniques allowing computers to emulate human intelligence, employing algorithms created for the analyses and the design of either predictions or conclusions based on the analysis of big datasets.
The latter is especially important for cancer research considering the critical mass of data available for analysis and that standard analysis methods fail to exploit to its fullest potential. This is particularly the case for multiomics data, with their high variation in nature, format or storage.
The proper and effective and integration of these novel methodologies into the standards of clinical – but also basic and translational – research could prove to be an important leap forward for oncology research. Hence, this event will have two core training objectives.
The first will be to ease the clinical and research community into the field of AI methodologies themselves, still misunderstood or not known to its full potential – from a general overview of the most frequently used ML/DL methods and Explainable AI to a deep dive in novel data platforms and repository structures integrating these approaches in their design. This will allow clinicians to identify the value of AI models for their trials and studies, making the volume of patient - and tumor-related data valuable and more fully exploitable; as well as biologists to assess its potential in tumor biology to discover new biomarkers and mechanisms.
The second main endpoint will be to demonstrate not only the possibilities offered by the inclusion of AI models in standard practice, but really to present some concrete and innovative activities where they are already being successfully implemented. The focus is to demonstrate in particular the value of AI for both its predictive power and for the possibilities it opens up for the discovery of both new biomarkers and of new molecules targeting specific tumors. In particular, one section will be focused on the translational field and the synergy between AI-powered multiomic data analysis and clinical research, with regards to cancer immunotherapy, for example metastatic lung cancer.

In this context, we will showcase and discuss ongoing projects, including I3LUNG, along with other initiatives focused on the diagnostic and treatment pathways optimization for lung cancer patients. These projects involve collaboration among research institutes, academia, and private companies. As the AI research field is evolving at a rapid pace, the event will be topped off by a session offering perspectives already going beyond the current state of the art and providing insights into the Artificial Intelligence of tomorrow – how it could be involved as full-fledged actor in clinical decision-making.

## FORMAT

The event is set to be a full-day program. The speakers will have a diverse background to reflect the spectrum of Artificial Intelligence research (and beyond), from Artificial Intelligence engineering experts, to clinicians and translational researchers, and hybrid figures such as clinical Artificial Intelligence specialists. The attendance is expected to mirror this variety, along with participants with a more specific background in imaging and pathology.

# Scientific Program

**08:30** ***POSTER SESSION***

**09:30** Welcome
**Arsela Prelaj**
**Gustavo Galmozzi** *President Fondazione IRCCS Istituto Nazionale dei Tumori*
**Carlo Nicora** *General Director Fondazione IRCCS Istituto Nazionale dei Tumori*
**Giovanni Apolone** *Scientific Director Fondazione IRCCS Istituto Nazionale dei Tumori*
**Filippo de Braud** *Director Dpt. of Oncology and Hemato-Oncology, Fondazione IRCCS Istituto Nazionale dei Tumori*
**Bruno Aratri** *President IPOP Onlus*

**09:50** Introduction
**Massimo Di Maio** *President-elect of AIOM*

## session 1

### BACKGROUND ON AI METHODOLOGIES AND THEIR USE IN THE CLINICAL PRACTICE

*Chairs:* **Monica Ganzinelli, Francisco Sanchez Vega, Francesco Trovò**

**10:00** Machine, Deep Learning and Reinforcement Learning in medicine
**Marcello Restelli**

**10:20** Explanable AI for RWD, genomics and gaps in images
**Vanja Miskovic**

**10:40** Deep Learning applied to Genomics and Transcriptomics
**Julien Vibert**

**11:00** Discussion

## session 2

### AI AND IMAGING: CLINICAL PRACTICE APPLICATION AND FUTURE DIRECTIONS

*Chairs:* **Giacomo Boracchi, Alessandro Cicchetti, Andrea Spagnoletti**

**11:20** Integration of radiomics in clinical practice for screening and diagnosis
**Mireia Crispin Ortuzar**

**11:40** The use of radiomics in prediction: treatment outcomes and toxicity
**Raquel Pérez-Lopez**

**12:00** Integration of digital pathology in clinical practice for screening and diagnosis
**Jakob Nikolas Kather**

**12:20** The use of digital pathology in prediction: treatment outcomes and toxicity
**Alexander T. Pearson**

**12:40** Discussion

**13:00** Lunch Break ***POSTER SESSION***

## session 3

### AI FOR OMICS AND MULTIMODAL DATA ANALYSIS

*Chairs:* **Luca Agnelli, Alessandra Pedrocchi, Arsela Prelaj**

**14:00** Multimodal integration: from methodology to its successful application
**Sohrab Shah**

**14:20** SHARED TALK Molecular Tumor Board and the role of AI: the oncologist and AI-expert point of view
**Filippo de Braud, Loic Verlingue**

**14:45** Drug discovery using virtual AI lab - Special lecture
**Marina Chiara Garassino**

**15:05** Discussion

## session 4

### DATA STORAGE AND ITS REGULATORY FRAMEWORK

*Chairs:* **Emilia Ambrosini, Sokol Kosta, Laura Mazzeo**

**15:25** Bridging the Gap: Federated Learning as a Catalyst for Collaborative Development of AI Models
**Daniel Truhn**

**15:45** Digital therapeutics: clinical applications in oncology
**Eugenio Santoro**

**16:05** AI and the MDR: between compliance and liability
**Francesca Gennari**

**16:25** Discussion

**16:40** Coffee Break ***POSTER SESSION***

## session 5

### SPECIAL SESSION AND PROJECTS

*Chairs:* **Giuseppe Lo Russo, Claudia Proto, Diego Signorelli**

**17:20** Accelerating Clinical Trials with AI-powered medical platforms for personalized dosing and Digital Twins
**Dean Ho**

**17:40** Updates on the I3LUNG Horizon Europe Project
**Leonardo Provenzano**

**17:50** Patients Decision Aid using AI tools
**Dario Monzani**

**18:00** Discussion

## session 6

### AWARDS (NO CME SESSION)

*Chairs:* **Alessandro De Toma, Roberto Ferrara, Giuseppe Viscardi**

**18.10** Introduction

**18:15** Deep Learning-Based Tool for Detection and on Mammography
**Filippo Pesapane**

**18:20** Modelling toxicity after prostate cancer radiotherapy using genetically guided Voxel-Based Analysis
**Nicola Rares Franco**

*Presenters:* **Ugo Pastorino, Gabriella Sozzi**

**18:25** Best poster award
**The winners**

**18:30** Farewell and take-home messages
**Arsela Prelaj**