



CORRELATIVE MICROSCOPY IN LIFE AND MATERIALS SCIENCES

6-7 November 2017

Istituto Superiore di Sanità

organized by

ISTITUTO SUPERIORE DI SANITÀ (ISS)
National Center for Drug Research and Evaluation

and

ITALIAN SOCIETY FOR MICROSCOPICAL SCIENCES (SISM)

ID N°: 151D17

Rationale

The activities of the National Center for Drug Research and Evaluation encompass numerous researches aimed to evaluate the effect of drugs on *in vitro* and *ex vivo* cell systems. These investigations call for microscopic and ultrastructural innovative techniques. We therefore propose a conference on the new frontiers of light and electron microscopy techniques in biomedical and materials sciences, in collaboration with the Italian Society for Microscopical Sciences (SISM).

The scientific literature of recent years confirms the importance of using correlative microscopy to highlight the relationship between structure and function, and trace the route of specific labeled compounds, both in viable and chemically fixed cells. Correlative microscopy can yield a three-dimensional map in an extended field because it uses different types of optical and electron microscopy with high resolution, essential for graphic enhancement and data organization. Thus, correlative microscopy offers the benefit of observing the structural and functional characteristics of molecules within the single cell or in complex biological models. Again, it is the most effective investigative method when dealing with dynamic structures such as fluorochromes and nanomaterials. The knowledge of innovative high-resolution microscopic techniques is proving crucial in both life and material sciences.

Aim and objectives

The conference aims to update participants on innovative microscopic equipment which, by correlating the various features of optical and electron microscopy, can maximize the potential applications of morphological and ultrastructural methods. The conference will address the limits of sample preparation, the optimization of image processing, and the critical analysis of experimental results with different materials.

Working method

Keynote lectures and technical-scientific presentations.

Programme

Monday, November 6th

- 08.30 Registration
- 09.00 Opening Ceremony
Prof. Walter Ricciardi, ISS President,
Prof. Elisabetta Falcieri, SISM President,
Dr. Stefania Meschini, ISS Scientific Coordinator of the event
- 09.30-12.30 **Correlative microscopy: principles and application potential**
Chairs: *Marco Vittori, Elisabetta Falcieri*
- 09.30 **Keynote Lecture**
Correlative light and electron microscopy in biology
Bruno M. Humbel
- 10.00 Applications for 3D characterization in the life sciences. Illumination correlative research using light, X-ray, and electron microscopy
Lars-Oliver Kautscher
- 10.20 Correlative imaging workflows across scales: a powerful approach for cell and tissue studies
Emine Korkmaz
- 10.40 Coffee break
- 11.10 Investigating cancer cell behaviour using correlative imaging by holographic microscopy and FIB-SEM tomography
Vratislav Kostal
- 11.30 The integrated CLEM desktop microscope for easy and fast correlative imaging
Ria Oosterveld
- 11.50 New solutions for correlative microscopy
Andy Yarwood
- 12.10 Preparation workflows for correlation microscopy
Frederic Leroux
- 12.30 Lunch
- 13.30-17.00 **Correlative microscopy applications in materials sciences**
Chairs: *Amelia Montone, Roberto Balboni*
- 13.30 **Keynote Lecture**
Correlative Microscopy as a powerful tool for coupling structural compositional and functional properties
Edoardo Bemporad

- 14.00 A case study of correlative approach to 3D microscopy: the silicon nanowires
Luca Boarino
- 14.30 Curvature driven nanoparticles decoration of graphene membranes
Cristiano Albonetti
- 15.30 Evaluation of antimycotic activity of zinc oxide nanoparticles by correlative microscopy
Daniela Uccelletti
- 16.00 Selected Talks
- 16.50 Discussion

Tuesday, November 7th

- 9.00-11.00 **Correlative microscopy applications in life sciences**
Chairs: *Agnese Molinari, Marco Crescenzi*
- 9.00 **Keynote Lecture**
Correlative microscopy in biomedicine: from the slow beginning decades ago to the rapidly expanding leading edge of today
Alberto Luini
- 9.30 Correlative electron microscopy in modern bio-medical research
Roman Polishchuk
- 10.00 Compatibility of correlative light and electron microscopy with three-dimensional and quantitative analysis in biology
Alexandre A. Mironov
- 10.30 Correlative X-ray micro tomography and TEM microscopy on biological samples for the study of complex pathologies
Mauro Gemmi
- 11.00 Coffee break
- 11.30-17.00 **Correlative microscopy applications in life sciences**
Chairs: *Annarica Calcabrini, Annarita Stringaro*
- 11.30 **Keynote Lecture**
The extraordinary microscope: multimodal and correlative approaches in nanomedicine
Alberto Diaspro
- 12.00 3D HDO-CLEM: Cellular compartment analysis by correlative light-electron microscopy on cryosections
Katia Cortese

12.30	New tools and protocols for correlative microscopy application to biomedical research <i>Maura Francolini</i>
13.00	Lunch
14.00	Visualizing fluorochrome-labelled nanoparticles and fluorescent free molecules at transmission electron microscopy by diaminobenzidine photo-oxidatidation <i>Manuela Malatesta</i>
14.30	Selected Talks
15.30	Discussion and Closing Remarks

SPEAKERS AND CHAIRPERSONS

Cristiano Albonetti - National Research Council, Bologna, Italy
Roberto Balboni - National Research Council, Bologna, Italy
Edoardo Bemporad - University "Rome III", Rome, Italy
Luca Boarino - National Institute of Metrological Research, Turin, Italy
Annarica Calcabrini - Istituto Superiore di Sanità, Rome, Italy
Katia Cortese - University of Genoa, Italy
Marco Crescenzi - Istituto Superiore di Sanità, Rome, Italy
Alberto Diaspro - Italian Institute of Technology, Genoa, Italy
Elisabetta Falcieri - University of Urbino, Italy
Maura Francolini - University of Milan, Italy
Mauro Gemmi - Italian Institute of Technology, Pisa, Italy
Bruno M. Humbel - University of Lausanne, Switzerland
Lars-Oliver Kautscher - Zeiss, Oberkochen, Germany
Emine Korkmaz - Fei-Thermo Fisher, Eindhoven, The Netherlands
Vratislav Kostal - Tescan, Brno, Czech Republic
Frederic Leroux - Leica Microsystems, Germany
Alberto Luini - National Research Council, Naples, Italy
Manuela Malatesta - University of Verona, Italy
Alexandre A. Mironov - Institute of Molecular Oncology, Milan, Italy
Agnese Molinari - Istituto Superiore di Sanità, Rome, Italy
Amelia Montone - Research Center ENEA, Rome, Italy
Ria Oosterveld - Phenom-world, The Netherlands
Roman Polishchuk - Telethon Institute of Genetics and Medicine, Milan, Italy
Andy Yarwood - Jeol, London, United Kingdom
Annarita Stringaro, Istituto Superiore di Sanità, Rome, Italy
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GENERAL INFORMATION

Venue: Istituto Superiore di Sanità, Bovet Hall
Viale Regina Elena 299 – 00161 Rome, Italy

Target audience: biologists, medical doctors, physicists, engineers, researchers and technicians.

Maximun number of participants: 90

ECM credits: NO

REGISTRATION (VAT included)

	<u>Early-bird registration</u> (ends 22 September 2017)	<u>Late Registration</u> (ends 27 October 2017)
SISM Members	euro 110,00	euro 120,00
Non Members	euro 140,00	euro 160,00
Students	euro 40,00	euro 50,00

The registration fee includes Congress material, access to on-line proceedings, lunches and coffee breaks.

The registration fee does not cover participants' travel and accommodation expenses.

Registrations will be accepted until the maximum capacity of the Hall is reached (90 seats).

The **registration form** is available on line at www.iss.it and www.sism.it

Please fill in, sign and send **together with receipt of payment** to maria.condello@iss.it

ABSTRACT SUBMISSION

The **Abstract template** will be available on line at www.sism.it

Please **submit** your abstract to maria.condello@iss.it **no later than Friday 8 September 2017**. (Make sure you have registered first.)

Submitters will be notified about abstract acceptance or rejection by 15 September 2017.

Accepted abstracts will be included in the Proceedings of the Conference on the European Journal of Histochemistry.

Language

The official language of the meeting is **English**.

Key dates

8 September: Abstract submission ends

15 September: Abstract acceptance notification

22 September: Early-bird registration ends

27 October: Late registration ends

Attendance Certificate

An attendance certificate will be issued to all participants at the end of the Conference.

For any further information, please contact the Scientific Secretariat.

Event organized with the unconditioned contributions of:



Acknowledgements

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Italian Association of Cell Cultures (AICC)
Italian Society of Anatomy and Histology (SIAI)
Italian Society of Histochemistry (SII)
Italian Society of Physics (SIF)