

April 19

9.00 -10.00 WELCOME & REGISTRATION

10.00-10.10 Institutional Greetings & Conference Opening

SESSION 1: PROTEINS and NUCLEIC ACIDS

Chairs: **L.Stella, P. Calligari**

10.10-10.50 **Invited Talk: G. Bussi**

Dissecting RNA dynamics combining molecular simulations and solution experiments

10.50-11.00 **F. Costa** *Noncanonical electromechanical coupling paths in the cardiac hERG channel*

11.00-11.10 **C. Guardiani** *CRACKing the allosteric gating of CRAC channel: a MD study*

11.10-11.20 **A. Del Giudice** *Regulation of the photosynthetic AB-GAPDH via self-assembly*

11.20-11.30 **E. Bassotti** *Post-lyophilized apoferritin and insulin: structure and dynamics characterization*

11.30-12.00 COFFEE BREAK

Chairs: **V.Minicozzi, L. Maiolo**

12.00-12.10 **F. Stellato** *Chasing the Elusive "In-Between" State of the Copper-Amyloid β Complex by X-ray Absorption through Partial Thermal Relaxation after Photoreduction*

12.10-12.20 **S.Botticelli** *OPTIMIZING [FEFE]-HYDROGENASE*

12.20-12.30 **A. Olivieri** *Structural insights into selective binding mechanism of the Ochratoxin A Aptamer*

12.30-12.40 **R. Piacentini** *Astrocyte-mediated synaptotoxic action of tau oligomers relies on Amyloid Precursor Protein Intracellular Domain-dependent expression of Glypican-4*

12.40-12.50 **A. Capocéfalo** *Interaction of amyloid fibrils with plasmonic nanoparticles: a nanoscale investigation towards the development of novel therapeutic strategies*

12.50-13.00 **B. Rizzuti** *Computational drug design against an intrinsically disordered oncoprotein*

13.00-14.00 LUNCH

SESSION 2: MICROFLUIDICS AND NANOSCIENCE

Chairs: **A. Gerardino, L. Businaro**

14.00-14.40 **Invited Talk: E.Di Fabrizio**

Nanotechnologies for biology and medicine

14.40-14.50 **A. Giacomello** *Hydrophobically gated nanofluidic memristors inspired by ion channels*

14.50-15.00 **S. Franco** *Study of the phase behaviour of dual responsive IPN microgels by combination of rheology and calorimetry*

15.00-15.10 **G. Perini** *Enhancement of Antitumor Efficacy via Photothermal Therapy using Carboxylated Graphene Quantum Dots: A Study on 3D Bioprinted Glioblastoma Models with Improved Drug-Membrane Permeability, Reactive Oxygen Species Production, and Immune System Recruitment*

15.10-15.20 **R. Reale** *A microfluidic scanning flow cytometer for accurate particle sizing*

15.20-15.30 **Y. Derevyanchuk** *Biocompatibility and Connectivity of Semiconductor Nanostructures for Cardiac Tissue Engineering Applications*

15.30-16.00 COFFEE BREAK

SESSION 3: BIOSENSING, DIAGNOSTIC AND ANALYTICAL APPLICATIONS

Chairs: **A. Convertino, G. Longo**

16.00-16.40 **Invited Talk: I. Barman**

Probing cellular biophysics with label-free high-speed quantitative phase imaging

16.40-16.50 **M.C. Castrovilli**

Ambient Electrospray Deposition: an Efficient Technique to Immobilize Laccase on cheap electrodes with unprecedented Reuse and Storage Performances

16.50-17.00 **M. Chinappi** *Tuning shape and surface charge of biological pores for controlling electroosmotic flow in nanopore based sensing devices*

17.00-17.10 **R. Pizzoferrato** *A new Optical Methods for Quantitative Detection of Microplastics in Water Based on Fluorescence Analysis*

17.10-17.20 **M. Nicoletti** *Exploring neuronal dynamics through biophysical models: an application to the C. elegans case.*

17.20-17.30 **B. Simonis** *Development of Resveratrol-loaded liposomes for brain delivery*

17.30-17.40 **G. Prevete** *Olive leaves extract loaded liposomes: physicochemical characterization and in vitro antimicrobial activity*

17.40-17.50 **M. Clemente** *Lipoplex-based systems for oligonucleotides delivery across blood-brain barrier*

17.50-18.00 **P. Hanieh** *Microsponges: an innovative drug delivery platform for the treatment of rheumatoid arthritis*

April 20

9.30 -10.00 WELCOME & REGISTRATION (**Foyer**)

SESSION 4: CELLULAR AND TISSUE BIOPHYSICS

Chairs: **V. Mussi, M. Girasole**

10.00 -10.10 **A. Caporale** *Brain parenchyma free water fraction is associated with tissue damage and impaired processing speed in multiple sclerosis*

10.10 -10.20 **M. Di Gioacchino** *Probing oxidative stress in cytological thyroid samples by Raman spectroscopy*

10.20 -10.30 **M. Fratini** *A multiscale approach based on the combination of DTI, XRD and histology to study the myeloarchitecture in a rat model of mTBI*

10.30 -11.10 **Invited Talk: G. Ruocco**

Brillouin microscopy: a new tool for mechanobiology

11.10 -11.20 **I. Delfino** *Modifications of mechanical and biochemical properties of neuroblastoma nuclei upon exposure to X-rays: a study by AFM and micro – FTIR spectroscopy*

11.20 -11.30 **M. Ciocca** *A Polymer Bio-Photoelectrolytic Platform for Electrical Signal Measurement and for Light Modulation of Ion Fluxes and Proliferation in a Neuroblastoma Cell Line*

11.30-12.00 COFFEE BREAK

SESSION 5: DEEP LEARNING, DIGITAL TWINS, DATA ANALYSIS AND MODELLING

Chairs: **F.R. Bertani, A. De Ninno**

12.00 -12.10 **G. Bretti** *A mathematical-based forecasting algorithm for immune cell migration in cancer-on-chip experiment*

12.10 -12.20 **A. Abeltino** *Personalized Metabolic Avatar: a digital replica of the human metabolism empowered by deep learning models*

12.20 -12.30 **G. Bianchetti** *Bridging in-vitro models and clinical applications through machine learning-based metabolic imaging: a focus on red blood cells functional alterations in diabetes-related complications*

12.30 -12.40 **A. Riente** *Development of a data-driven personalized model for human glucose homeostasis through a digital web-based application powered by wearable sensors*

12.40 -12.50 **C. Serantoni** *A data-driven model to assess the influence of diet and metabolism on the cardiovascular response at a personalized level*

12.50 -13.00 **G. Zimatore** *On detection of transitions in nonlinear signals: a multidisciplinary challenge.*

SESSION 6: MEMBRANES

13.00 -13.10 **C.M. Casciola** *The local variation of the Gaussian modulus enables different pathways for fluid lipid vesicle fusion*

13.10 -13.20 **Y. Gerelli** *Probing the Separation Distance between Viruses and Cell Membrane Mimics with Sub- Nanometer Accuracy*

13.20 -13.30 **F. Toma** *Preparation and characterization of liposomes for the delivery of an antarctic fish-derived antimicrobial peptide (AMP)*

13.30 -13.35 **R. Di Santo** *Spectral profiling of circulating extracellular vesicles for cancer liquid biopsy through FTIR spectroscopy (FLASH)*

13.35-14.35 LUNCH

SESSION 7: ANTIMICROBIAL APPROACHES, SARS-CoV2

Chairs: **M. Ledda, A. Notargiacomo**

14.35 -14.40 **E. Franci** *Kinetics of interaction between an antimicrobial peptide and bacterial cells (FLASH)*

14.40 -14.50 **C.Troiano** *Rapid assessment of susceptibility of bacteria and erythrocytes to antimicrobial peptides by single-cell impedance cytometry*

14.50 -15.00 **A. Romeo e C. Arcangeli** *Insights into the possible interaction between fine particulate matter and SARS-CoV-2: molecular and in silico approaches*

15.00 -15.10 **A. D'Arco** *Towards a spectroscopic sensoristic platform for airborne pathogens: infrared characterization of spike glycoproteins from MERS-CoV and its variants*

15.10 -15.20 **D. Di Marino** *Tailoring protein structures towards ultrasensitive detection of SARS-CoV-2 and Extracellular Vesicles using graphene FET biosensors*

SESSION 8: REGIONAL PROJECTS

15.20 -15.30 **N. Fiaschini** *Design, production and characterization of oily extracts-loaded electrospun membranes for wound healing application*

15.30 -15.40 **V. Nigro** *Fluorescent Nuclear Track Detectors for Radiobiology: the BIOTRACK project*

15.40 -15.50 **J.Chiarinelli** *The BioDivErSI project*

15.50 -15.55 **A. Sciortino** *Exploiting the DIagnostic potential of disorder: novel Nanostructured platform for rapid, label-free and low-cost analysis of genomic DNA (FLASH)*

15.55 -16.00 **C. Ricci** *Portable optical spectroscopy in combination with machine learning techniques for quantification of wheat protein content (FLASH)*

16.00 -16.05 **G. Imparato** *Development of spectroscopic non-destructive method for food adulteration: preliminary fluorescence test of saffron and its adulterants. (FLASH)*

16.05 -16.30 COFFEE BREAK

16.30 -17.30 **Dialogue: INDISTINTI CONFINI**

Thoughts and considerations from the "Esattezza" chapter in the "Lezioni Americane" by Italo Calvino with Laura Di Nicola e Alberto Diaspro

17.30 - 18.00 Closing Remarks, Best Poster and Image Contest Award Ceremony