SIB 2019

60th CONGRESS

Italian Society of Biochemistry
and Molecular Biology

Lecce, September 18 – 20, 2019

BOOK OF ABSTRACTS

Italian Society of Biochemistry and Molecular Biology
Lecce, September 18 - 20, 2019

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Claudia Piccoli – Università degli Studi di Foggia

PROGRAM OVERVIEW

Wednesday, September 18

12.00 Registration
14.00 Congress Opening and Welcome

14.30 "Eraldo Antonini" Lecture

Chair: Ferdinando Palmieri (Bari)

Sir John E. Walker, Nobel Prize in Chemistry (Cambridge)

Regulation, functional analysis and assembly of dimeric ATP synthases in mitochondria

15.30 Plenary Symposium "The seventh wonder: Translocases (EC 7)"

Chair: Vito De Pinto (Catania) e Paola Lunetti (Lecce)

15.40 – 16.10 *Keynote lecture* – Matthias Hediger (Bern, Switzerland)
Fundamentals and importance of the SLC solute carrier superfamily and future perspectives

16.10 – 16.30 Giuseppe Fiermonte (Bari)
New insights on the function of the mitochondrial uncoupling proteins: from physiology to biochemistry and back

16.30 – 16.50 Cesare Indiveri (Calabria)
The glutamine traffic in cells: old fashion and new releases

16.50 – 17.10 Eleonora Da Pozzo (Pisa)
TSPO associated protein complexes: different structures, different functions

17.10 – 17.20 Angela Ostuni (Potenza)
Synthetic and natural compounds regulate activity of ABCC6 transporter

17.30 Lecce guided tour
19:30 Welcome Cocktail

Thursday, September 19

9:00 **Plenary Symposium – "Cry-o(r)-EM: you'd better see it"**

Chair: Andrea Mozzarelli (Parma) e Paolo Swuec (Milano)

9.00 – 9.30 *Keynote lecture* – Josè Lopez Carrascosa (Madrid, Spain)
Cryo EM structural characterization of Phage T7 viral tail machinery: A model for DNA retention and ejection from the viral capsid

9.30 – 9.50 Martino Bolognesi (Milano)
Facing challenges of large protein assemblies through single particle cryo EM

9.50 – 10.10 Beatrice Vallone (Roma)
Key interactions for iron uptake are exploited by infectious agents as revealed by the cryo-EM structure of the Ferritin-CD71 complex

10.10 – 10.30 Chiara Marabelli (Pavia)
Molecular mechanism of nucleosome recognition

10.30 – 10.40 Alessandro Grinzato (Padova)
Cryo-EM atomic structure of Potato Virus X

10:40 Coffee break and poster exhibition

11.00 Maurizio Brunori: Memory of Alessandro Rossi Fanelli
(on the thirtieth anniversary of the disappearance)

Plenary Symposium – "Enzymes: new facts for old cofactors"

Chair: Maurizio Brunori (Roma) e Barbara Cellini (Perugia)

11.10 – 11.30 Francesca Cutruzzolà (Roma)
Serine hydroxymethyltransferase, a multitasking metabolic enzyme enjoying new partnerships as a nucleic acid binding protein

11.30 – 11.50 Stefano Bruno (Parma)
Understanding the role of chemical environment in cysteine S-nitrosylation: the case of human serine racemase

11.50 – 12.10 Francesco Angelucci (L'Aquila)
Pioneering strategies to target a FAD/NAD-linked reductase family member of crucial importance in neglected pathogens

12.10 – 12.30 Sheila Sadeghi (Torino)
Human FMO3 and its polymorphic variants: relevance to medicine

12.30 – 12.40 Luigi Palese (Bari)
Heme-copper oxidases: could they be stochastic machines?

13.00 Lunch and poster exhibition

Parallel Symposia

14.30 **PS.1 "Biotechnologies"**

14.30 Antonio De Flora: Memory of Arturo Bonsignore
(on the thirtieth anniversary of the disappearance)

"Biotechnologies for human health"

Chair: Antonio De Flora (Genova) e Chiara Falciani (Siena)

14.40 – 15.10 *Keynote lecture* – Luigi Naldini (Milano)
Genetic engineering of hematopoiesis for treating genetic disease and cancer

15.10 – 15.30 Mirko Pinotti (Ferrara)
From aberrant splicing mechanisms to innovative therapies for genetic disorders

15.30 – 15.50 Maria Vittoria Cubellis (Napoli)
Disease missense mutations: a challenge for biochemists

15.50 – 16.05 Antonella Forlino (Pavia)
Endoplasmic reticulum stress as target in skeletal diseases: use of in vitro and in vivo models

16.05 – 16.15 Alessandro Angelini (Venezia)
Directed evolution of broadly crossreactive chemokine-blocking antibodies efficacious in inflammatory arthritis

16.15 Coffee break

"Biotechnologies for sustainable growth"
Chair: Marco Moracci (Napoli) e Giovanna Di Nardo (Torino)

16.35 – 17.05 *Keynote lecture* – Carlos Fontes (Lisbona, Portogallo)
Cellulosomes, a new paradigm to orchestrate the function of multi enzyme complexes

17.05 – 17.20 Loredana Mariniello (Napoli)
Sustainable hydrocolloid-based bioplastics for obtaining healthier foods

17.20 – 17.35 Davide Ferraris (Piemonte Orientale)
Structural insights into hydroxyproline metabolism in microorganisms

17.35 – 17.50 Elena Rosini (Insubria)
Lignin valorization: targeted value-added chemicals production by multi-enzymatic approaches

17.50 – 18.00 Giuseppe Perugino (CNR – IBBR)
A journey down to hell: new thermostable protein-tags for biotechnology at high temperatures

14.30 **PS.2 "Computational Biochemistry and Systems Biology"**

14.30 Giorgio Lenaz: Memory of Giovanni Moruzzi
(on the thirtieth anniversary of the disappearance)

"Metabolomics"

Chair: Lilia Alberghina (Milano) and Giorgio Lenaz (Bologna)

14.40 – 15.10 *Keynote lecture* – Christian M. Metallo (San Diego, USA)
Serine and lipid metabolism link cancer, macular disease, and neuropathy

15.10 – 15.30 Marco Vanoni (Milano Bicocca)
Systems metabolomics of cancer: from phenotypic analysis to design principles

15.30 – 15.50 Paola Chiarugi (Firenze)
Nutritional exchanges within tumor microenvironment: mitochondria at the cross road

15.50 – 16.05 Sergio Giannattasio (CNR - IBIOM)
Mitochondria-cytosol-nucleus crosstalk: learning from Saccharomyces cerevisiae

16.05– 16.15 Thelma Pertinhez (Parma)
Metabolic profiling of Red Blood Cells in blood bank conditions: identification of storage lesions biomarkers

16.15 Coffee break

"Macromolecules"

Chair: Pierluigi Martelli (Bologna) e Daniele Di Marino (Ancona)

16.35 – 17.05 *Keynote lecture* – Rita Casadio (Bologna)
Transfer of knowledge for structural and functional annotation of protein sequence

17.05 – 17.20 Silvio Tosatto (Padova)
Computational resources for intrinsically disordered proteins

17.20 – 17.35 Francesca Fanelli (Modena)
Uncovering protein function by structure network analysis

17.35 – 17.50 Anna Marabotti (Salerno)
A computational approach to investigate the interactions between a potential pharmacological chaperone and GALT enzyme

17.50 – 18.00 Federico Iacovelli (Roma)
Design, simulation and experimental assembly of functionalized DNA nanostructures for targeted drug delivery

18.00 SIB Assembly
20.30 Social Dinner

Friday, September 20

Parallel Symposia

9:30 **PS.3 "Cancer and metabolism: chicken or egg?"**

9:30 Filiberto Cimino: Memory of Francesco Cetrangolo
(on the thirtieth anniversary of the disappearance)

Chair: Filiberto Cimino (Napoli) e Ferdinando Chiaradonna (Milano Bicocca)

9.40 – 10.10 *Keynote lecture* – Antonio Moschetta (Bari)
Transcriptional regulation of metabolic pathways in cancer: role of lipid sensing nuclear receptors

10.10 – 10.30 Daniela Gaglio (CNR - IBFM)
Metabolic rewiring connectivity drives enhanced growth drug response by versatile glucose and glutamine utilization in K-Ras tumors

10.30 – 11.50 Fiammetta M. Romano (Napoli)
Scaffold proteins of cancer signaling networks: the paradigm of FK506 binding protein 51 (FKBP51) supporting tumor intrinsic properties and immune escape

10.50 Coffee break and poster exhibition

11.10 – 11.30 Massimo Donadelli (Verona)
Mutant p53-dependent alterations of cancer metabolism and of signaling pathways involved in autophagy and redox regulation

11.30 – 11.50 Claudia Piccoli (Foggia)
Mitochondrial metabolism as driver in cancer (stem) cell biology

11.50 – 12.00 Emanuela Stampone (Campania)
Post-translational modifications of the cell growth modulator p57 and human cancers

9.30 **PS.4 "Nutrition and epigenetics: express yourself through food"**

Chair: Francesco Bonomi (Milano) e Arianna Vignini (Ancona)

9.30 – 10.00 *Keynote lecture* – Rosita Gabbianelli (Camerino)
Nutri-epigenetics and health

10.00 – 10.25 Andrea Fuso (Roma)
The "one-carbon" metabolism: nutrition - epigenetics - neurodegeneration

10.25 – 10.50 Claudio D'Addario (Teramo)
Transcriptional Regulation of Mu Opioid and Type 1 Cannabinoid Receptor Genes in Obesity: preclinical and clinical evidence

10.50 Coffee break and poster exhibition

11.10 – 11.25 Fabio Ciccarone (Roma Tor Vergata)
High Dietary Fat Intake: examples of diet-induced and metabolic/epigenetic defects

11.25– 11.40 Silvia Cetrullo (Bologna)
Palmitic acid and n-3 polyunsaturated fatty acid supplementation in cardiac cells: gene regulation and epigenetics in cell survival and hypertrophy

11.40 – 11.50 Alberto Zullo (Sannio)
Nutrient deprivation and sirtuin epigenetics: autophagy vs apoptosis

12:00 **"The elevator-pitch contest" – Short talks (5 min – 3 slides) from submitted abstracts**

13.00 Closing Remarks

Plenary Symposium

Enzymes: new facts for old cofactors

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Heme-copper oxidases: could they be stochastic machines?

Luigi Leonardo Palese

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Heme-copper oxidases (HCOs) are the terminal enzymes of many aerobic respiratory chains, including the mitochondrial one. HCOs reduce molecular oxygen in a process coupled with proton pumping [1,2]. Despite decades of intense work, some features of this proton pump mechanism still remain controversial [1-3]. Currently accepted models require, more or less explicitly, an ordered sequence of events, and can be considered deterministic. Taking into account the cytochrome *c* oxidase clusters of structures and experimental data on which there is a general consensus, we suggested a stochastic pump mechanism for this enzyme class [4]. From a biochemical point of view, the model is essentially based on the decoupling of the redox linked events at the proton loading site from the fluctuations of the access barriers to the intramolecular proton conduction pathways. This model predicts some pump features that can be hardly explained by deterministic models, such as the convex dependence of the stoichiometry of the pump on the electron transfer rate [1,3,5]. Furthermore, this stochastic model provides a rational explanation for contrasting evidences from single-molecule experiments performed on HCOs incorporated in proteoliposomes and predicts when it is more likely to observe leak states during HCO turnover [6,7].

[1] M. Wikström, K. Krab, V. Sharma, Chem. Rev. 118 (2018) 2469-2490.
[2] S. Yoshikawa, A. Shimada, Chem. Rev. 115 (2015) 1936-1989.
[3] N. Capitanio, L.L. Palese, G. Capitanio, et al., Biochim. Biophys. Acta 1817 (2012) 558-566.
[4] L.L. Palese, Phys. Chem. Chem. Phys. 21 (2019) 4822-4830.
[5] N. Capitanio, G. Capitanio, D.A. Demarinis, et al., Biochemistry 35 (1996) 10800-10806.
[6] Li M, Jørgensen SK, McMillan DG, et al., J. Am. Chem. Soc. 137 (2015) 16055-16063.
[7] Berg J, Block S, Höök F, et al., Isr. J. Chem. 57 (2017) 437 – 445.