



**La chimica degli alimenti e i giovani ricercatori: nuovi  
approcci in tema di qualità,  
sicurezza e aspetti funzionali di ingredienti alimentari**

Una giornata per il futuro della ricerca nella Chimica degli Alimenti

Milano, Sala Napoleonica, Palazzo Greppi

25 Settembre 2017

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**25 Settembre 2017**

**Sala Napoleonica, Palazzo Greppi, via S. Antonio 10, Milano**

- 8.30 Registrazione dei partecipanti  
9.00 Benvenuto e apertura del convegno - Prof. Patrizia Restani (Università degli Studi di Milano) e Prof. Gianni Galaverna (Università di Parma)  
9.10 Introduzione (Chiara Di Lorenzo e Martina Cirilini)

**Sezione CARATTERIZZAZIONE CHIMICA DEGLI ALIMENTI**

- 9.15 **Gilda Aiello** (Università degli Studi di Milano, Fac. Scienze del Farmaco)  
Proteomic Investigation of Sweet Algerian Apricot Kernels (*Prunus armeniaca* L.) by LC-MS/MS coupled to Combinatorial Peptide Ligand Libraries
- 9.30 **Caterina Bergantin** (Università di Ferrara, Fac. Scienze del Farmaco)  
Chemical characterization and bioaccessibility of pumpkin varieties from southern Po Delta area
- 9.45 **Matteo Bordiga** (Università del Piemonte Orientale)  
The impact of distillation process on prebiotic activity of different oligosaccharidic fractions extracted from grape seeds
- 10.00 **Lucia Marchetti** (Università di Modena-Reggio Emilia)  
Usefulness of <sup>1</sup>H-NMR for qualitative and quantitative characterization of Hop (*Humulus lupulus* L.)
- 10.15 **Giacomo Petretto** (Università di Sassari)  
Stir Bar Sorptive Extraction Coupled with GC/MS Applied to Honey: Optimization of Method and Comparative Study with Head Space Extraction Techniques

**Comunicazioni brevi (Digital Poster Session)**

- 10.30 **Baldi Alessandra** (Università di Pavia)  
Chemical characterization of fruits from *Adansonia digitata* L.: a multi-methodological approach
- 10.35 **Bellumori Maria** (Università di Firenze)  
Polyphenols determination in coloured-fleshed potatoes from Perù
- 10.45-11.15 Discussione
- 11.15-11.30 Coffe break

**Sezione NUTRACEUTICA**

- 11.30 **Giovanni Caprioli** (Università di Camerino, Fac. Scienze del Farmaco)  
Lentils: a healthy food and a tool for a novel nutraceutical approach
- 11.45 **Valeria Curti** (Università di Pavia)  
Chemical composition and epigenetic effect of green and brown propolis
- 12.00 **Chiara Di Lorenzo** (Università degli Studi di Milano, Fac. Scienze del Farmaco)  
New *in vitro* approaches to evaluate antioxidant activity of food and their application to real samples
- 12.15 **Carmen Lammi** (Università degli Studi di Milano, Fac. Scienze del Farmaco)  
Hempseed peptide: proteomic characterization and molecular investigation of their hypocholesterolemic effect on human hepatic cells
- 12.30 **Monica Locatelli** (Università del Piemonte Orientale, Fac. Scienze del Farmaco)  
Italian pigmented rice varieties (*Oryza sativa*): an overview on the phenolic composition, nutraceutical potentiality and technological aspects

#### **Comunicazioni brevi (Digital Poster Session)**

- 12.45 **Annalisa Maietti** (Università di Ferrara)  
Study of nettle enriched bread as new functional food
- 12.50-13.15 Discussione

#### **Sezione CONTROLLO QUALITÀ/ILLECITI**

- 14.00 **Martina Cirilini** (Università di Parma)  
Molecular markers of bioactivity in pork meat products: characterization of gastro-intestinal digested samples
- 14.15 **Valentina di Rienzo** (Università di Bari)  
Agreement between research institutions and regulatory bodies: best practices for the validation of bioanalytical methods for tracking and identification of fraud in the olive oil sector.
- 14.30 **Vladimiro Cardenia** (Università di Bologna)  
Food Crossing District project: by-products fingerprinting for industrial symbiosis in Emilia Romagna Region
- 14.45 **Cristiano Garino** (Università del Piemonte Orientale)  
Set up of an untargeted method based on lab-on-a-chip® protein micro electrophoresis applied to salmon traceability
- 15.00 **Giulia Graziani** (Università di Napoli)  
Simultaneous determination of isoflavones and mycotoxins in vegetarian foods by HRMS-Orbitrap
- 15.15 **Matteo Perini** (Fondazione Edmund Mach, San Michele all'Adige, TN)  
Stable Isotope Ratio Analysis for authentication of Red Yeast Rice

15.30            **Enrico Valli** (Università di Bologna)  
The EU H2020 OLEUM Project: innovative analytical strategies to fight  
olive oil fraud. Focus on the soft-deodorization

**Comunicazioni brevi (Digital Poster Session)**

15.45            **Francesca Colombo** (Università degli Studi di Milano)  
Detection of adulterations and counterfeits in food supplements: development  
and validation of fast analytical methods

15.50            **Agnese Giacomino** (Università di Torino)  
Inorganic and redox profiles as “fingerprint” of italian extravirgin oil

15.55            **Veronica Lolli** (Università di Parma)  
Determination of cyclopropane fatty acids in food of animal origin by 1hnmr  
spectroscopy

16.00            **Giulia Leni** (Università di Parma)  
Evaluation of the chemical composition of hermetia illucens prepupae for  
potential food applications

16.05            **Stefania Baldassarre** (Università di Parma)  
Agroindustrial by-products as source of pectin: extraction and  
characterization

16.10-16.30    Discussione e chiusura dei lavori

16.30-18.00    Riunione Gruppo Scientifico Disciplinare

*Oral presentation 7*

## **NEW IN VITRO APPROACHES TO EVALUATE ANTIOXIDANT ACTIVITY OF FOOD AND THEIR APPLICATION TO REAL SAMPLES**

**Chiara Di Lorenzo<sup>1</sup>, Francesca Colombo<sup>1</sup>, Mihaela Badea<sup>2</sup>, Francesca Orgiu<sup>1</sup>,  
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Several epidemiological studies have shown that the production of reactive oxygen species (ROS) contributes to the risk factors for chronic pathological conditions, such as cardiovascular diseases, cancer and diabetes [1]. A diet that includes foods rich in antioxidant compounds, in combination with a correct lifestyle, represents a possible approach to counteract the negative effects of the oxidative stress.

On these bases, several studies have been focused on the determination of antioxidant properties of food; the methods used to assess the antioxidant activity differ from each other in terms of chemical bases and reaction conditions. Considering the chemical diversity of the different classes of molecules, a single assay cannot accurately reflect their antioxidant activity.

The aim of this study was to set up and apply different *in vitro* approaches for a fast screening of the antioxidant activity of different foods/food supplements, including wine.

The methods included: 1) Folin-Ciocalteu's assay for the quantification of total polyphenol content [2]; 2) DPPH (1,1-diphenyl-2-picrylhydrazyl) spectrophotometric



assay; 3) Trolox Equivalent Antioxidant Capacity (TEAC) spectrophotometric assay for measuring the capacity of the samples to scavenge ABTS radical [3]. Two novel approaches were also used in parallel: 1) High Performance Thin Layer Chromatography (HPTLC) for the semi-quantitative measure of antioxidant activity associated with wine and its specific compounds; 2) detection by an electrochemical biosensor, an analytical device that includes a biological detector coupled to a chemical transducer.

Although the method based on biosensor needs further improvement, the first results indicate that this approach could be suitable for a fast measure of antioxidant activity. In conclusion, all approaches used in this research show some limitations, but when integrated they could represent a useful tool to assess antioxidant properties of foodstuff, reflecting at least in part the potential *in vivo* protecting activity.

### **References**

- [1] L.A. Pham-Huy, H. He, C. Pham-Huy. Free radicals, antioxidant disease and health. *Int J Biomed Sci* **2008**, *4*, 89-96.
- [2] V. L. Singleton, J.A. Rossi. Colorimetry of total phenolics with phosphomolybdic-phosphotungstic acid reagents. *Am. J. Enol. Viticult.* **1965**, *16*, 144-158.
- [3] W. Brand-Williams, M.E. Cuvelier, C. Berset. Use of a free radical method to evaluate antioxidant activity. *Food Sci. Technol.* 1995, *28*, 25-30.

