



# Spray Nasale e Orale Anti Covid -19 ingegnerizzato con liposomi



SPRAY ANTI COVID -19

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**USE OF NATURAL INGREDIENTS WITH ANTIVIRAL ACTIVITY IN THE PRODUCTION OF NASAL AND ORO-  
PHARYNGEAL SPRAYS FOR THE PREVENTION OF FLU SYNDROME RESULTING FROM SARS COV2: THE  
CROSS-BORDER 'SPRAY' PROJECT**

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The 'ANTI COVID-19 NASAL AND ORAL SPRAY FORMULA WITH LIPOSOMES' project was launched in 2022 in the context of the 'Interreg Italy-Switzerland' cross-border European Territorial Cooperation Programme and sees the partnership among DGP PHARMA srl, an Italian pharmaceutical company specialised in the production of food supplements and medical devices with innovative formulations, the IBIS Consortium (Innovative Bio-based and Sustainable products and processes) co-manager of the Piedmontese Innovation cluster CGREEN, and VB Technochemicals SA (Canton Ticino-Switzerland), a company specialised in formulations and their characterisation.

- The scientific aim of the project is the evidence-based search for ingredients of natural origin extracted from plants or parts thereof that boast health-promoting properties to be engineered with liposomes for the development of an innovative medical device in an oral as well as nasal spray formulation to be used as prophylaxis for the treatment of acute respiratory disease caused by the coronavirus SARS-CoV-2 virus, which leads to the disease known as COVID-19.

The WHO (World Health Organisation) has pronounced itself in favour of the therapeutic use of medicinal plants, stimulating scientific research in the direction of chemical, pharmacological and clinical investigation to confirm, explain and specify the many medicinal properties of plants.

- the formulated product can compete with viruses for entry into the body's cells: to this end, its effectiveness is being tested in vitro. The product is intended to be a preventive measure against infection with COVID-19, as well as against other flu syndromes with the same characteristics, by inhibiting the anchoring of the virus on the mucous membrane epithelium and thus its entry into the body.

Phytotherapeutic ingredients contain active constituents which are responsible, among others, for their antiviral, antibacterial, antimicrobial, and antioxidant activity. However, their use has always been limited due to poor solubility. Through the results of the 'Spray' project, experiments are being carried out to show that liposome-based carriers can solve any absorption problems.

- The product is not intended to replace the Ministry of Health's indications on the use of masks, physical distancing, use of vaccines or medication for Covid, but is intended to help as an additional protective layer, as well as being a preventive solution for viral respiratory diseases including seasonal flu.

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Structure-activity relationship (SAR) and molecular dynamics study of withaferin-A fragment derivatives as potential therapeutic lead against main protease (Mpro) of SARS-CoV-2.

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Withanone from *Withania somnifera* Attenuates SARS-CoV-2 RBD and Host ACE2 Interactions to Rescue Spike Protein Induced Pathologies in Humanized Zebrafish Model

Acharya Balkrishna<sup>1 2</sup>, Subarna Pokhrel<sup>1</sup>, Hoshiyar Singh<sup>1</sup>, Monali Joshi<sup>1</sup>, Vallabh Prakash Mulay<sup>1</sup>, Swati Haldar<sup>1</sup>, Anurag Varshney<sup>1 2</sup>

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*Vegetos* 2022 Jun 15;1-20. doi: 10.1007/s42535-022-00404-4. Online ahead of print.



# SCIENTIFIC PROGRAM

## Sunday, September 3<sup>rd</sup>

15:00	<b>Registration</b>
17:00	<b>Opening ceremony</b> <i>Chair: Erika Del Grosso</i>
17:30	<b>PL1</b> From Metabolism to Metabolomics – an analytical journey. <i>Serge Rudaz, University of Geneva (Switzerland)</i>
18:40	<b>"Trio ARTEMIDE" concert</b>
19:30	<b>Welcome cocktails</b>

## Monday, September 4<sup>th</sup>

09:20	<b>Opening Remarks by the University Rector</b> <i>Gian Carlo Avanzi, Università del Piemonte Orientale (Italy)</i>
	<b>Pharmaceutical Analysis I</b> <i>Chairs: Laura Mercolini and Bezhan Chankvetadze</i>
09:30	<b>KN1</b> Application of polysaccharide-based chiral columns to enantioselective bioanalysis of psychotropic compounds. <i>Bezhan Chankvetadze - University of Tbilisi (Georgia)</i>
10:00	<b>OC1</b> Surface plasmon resonance and grating-coupled interferometry to investigate interactions with GPR17 membrane receptor. <i>Francesca Rinaldi - University of Pavia (Italy)</i>
10:20	<b>FC1</b> Accelerating Oligonucleotide Research Using Novel Bioinert LC, QTOF and TQ LC-MS. <i>Paolo Redegalli - Shimadzu (Italy)</i>
10:30	<b>Coffee break</b>
	<b>Pharmaceutical Analysis II</b> <i>Chairs: Roccaldo Sardella and István Ilisz</i>
11:00	<b>KN2</b> Advanced analytical tools in pharmaceutical analysis. 1D and 2D LC-MS techniques applied in biomedical sciences. <i>István Ilisz - University of Szeged (Hungary)</i>
11:30	<b>OC2</b> Rethinking a sample preparation procedure overlooked for too long. <i>Luca Regazzoni - Università degli Studi di Milano (Italy)</i>
11:50	<b>OC3</b> Can purified water impact your LC-MS analyses of pharmaceutical molecules? <i>Graziano Marcer - Merck Life Science (Italy)</i>
12:10	<b>Lunch</b>
13:15	<b>Poster session I</b>

**Bioanalysis in Drug Discovery & Development****Chairs: Angela De Simone and Laura Goracci**

- 14:30 **KN3** Untargeted Lipidomics in early drug discovery: aims and computer-aided workflows.  
**Laura Goracci** - University of Perugia (Italy)
- 15:00 **OC4** LC-MS/MS and IC-LC-MS/MS methods for the quantification of NBE and ADC in preclinical studies.  
**Ilse Maria Luce De Salve** - Merck RBM Colletterto Giacosa (Italy)
- 15:20 **OC5** Integrated mass spectrometry-based strategy to evaluate metabolic stability, pharmacokinetics, and pharmacodynamics: A case study on novel soluble epoxide hydrolase inhibitors.  
**Manuela Giovanna Basilicata** - University of Salerno (Italy)
- 15:40 **OC6** Mass Spectrometry Imaging as support to novel CB-2 agonist development: simultaneous spatial detection of multiple neurotransmitters in a model of cognitive impairment.  
**Emanuela Salviati** - University of Salerno (Italy)
- 16:00 **Coffee break**

**Food Analysis****Chairs: Jean Daniel Coisson and Chiara Cordero**

- 16:20 **KN4** Comprehensive two-dimensional gas chromatography a gestalt technique in food metabolomics.  
**Chiara Cordero** - University of Turin (Italy)
- 16:50 **OC7** A new millifluidic-based gastrointestinal model to study bioaccessibility and cytotoxicity of bioactive compounds.  
**Raffaella Colombo** - University of Pavia (Italy)
- 17:10 **OC8** Integrated analytical approaches for the characterization of nutraceutical bioactives in microalgae.  
**Serena Montanari** - Alma Mater Studiorum University of Bologna (Italy)

**Tuesday, September 5<sup>th</sup>****Chair: Ersilia De Lorenzi**

- 09:15 **PL2** Molecularly imprinted polymers as versatile abiotic receptors in bioanalysis.  
**Börje Sellergren** - Malmö University (Sweden)

**Clinical and Biomedical Analysis****Chairs: Caterina Temporini and Myriam Taverna**

- 10:00 **KN5** Microfluidic and electrophoretic approaches to address the challenges generated by the exploration of extracellular vesicles for diagnostic or therapeutic applications.  
**Myriam Taverna** - University of Paris-Saclay, IGPS, Orsay (France)
- 10:30 **OC9** Lipidomics of neuroblastoma cells under AR<sub>1-42</sub> toxic insult  
**Lara Davani** - Alma Mater Studiorum University of Bologna (Italy)



10:50	GLYCAN SPECIFIC MIPS FOR CANCER ASSOCIATED BIOMARKERS. <b>FC2</b> <i>CECILIA CONTARDI - UNIVERSITY OF PAVIA (ITALY)</i>
11:00	COMPREHENSIVE CHARACTERIZATION OF PROTEIN THERAPEUTICS USING ELECTRON ACTIVATED <b>FC3</b> DISSOCIATION (EAD)
11:10	<i>COFFEE BREAK</i>

### Protein Analysis

**Chairs: Francesco Epifano and Jose Luis Capelo**

11:30	Prescriptomics: what is it expecting ahead? <b>KN6</b> <i>Jose Luis Capelo - University of Lisbon (Portugal)</i>
12:00	M <sup>PRO</sup> protease (SARS-CoV-2) covalent inhibitors identification from an anthocyanin- <b>OC10</b> rich blueberry extract using an OMICS-based analytical platform. <i>Alessandra Anna Altomare - Università degli Studi di Milano (Italy)</i>
12:20	Elucidation of the anti-inflammatory and antioxidant activities of 5-(3'-4'- dihydrophenyl)- $\gamma$ -valerolactone, the main metabolite of a standardized grapeseed <b>OC11</b> pacs extract through a proteomic approach. <i>Giovanna Baron - Università degli Studi di Milano (Italy)</i>
12:40	<i>Lunch</i>
14:00	<i>Poster session II</i>

### Metabolomics and Lipidomics

**Chairs: Giancarlo Aldini and Antonia García**

15:00	Multiplatform strategies for the study of microbial metabolites by MS-based <b>KN7</b> metabolomics. <i>Antonia García - University San Pablo, Madrid (Spain)</i>
15:30	Metaproteomics and metabolomics investigation of microbiome alterations in pediatric obese patients subjected to a dietary intervention with Mediterranean <b>OC12</b> diet <i>Marcello Manfredi - University of Piemonte Orientale</i>
15:50	Sub-5 min 4D-Lipidomics: A proof of concept. <b>OC13</b> <i>Fabrizio Merciai - University of Salerno (Italy)</i>
16:10	Investigating the metabolomic network in patients with diabetic kidney disease. <b>FC4</b> <i>Marta Nugnes - Alma Mater Studiorum University of Bologna (Italy)</i>
16:20	<i>Coffee break</i>

### Drug Product Analysis

**Chairs: Eduardo Maria Sommella and Simone Nicolardi**

16:40	APPLICATION OF MALDI FT-ICR MS IN THE DEVELOPMENT OF GLYCOENGINEERED BACTERIAL <b>KN8</b> <i>E. COLI</i> VACCINES.
17:10	APPLICATION OF ION CHROMATOGRAPHY TO ANALYSE PHARMACEUTICAL FORMULATIONS. <b>OC14</b> <i>ERWIN ADAMS - UNIVERSITY OF LEUVEN (BELGIUM)</i>
17:30	CHEMOMETRIC TOOLS FOR PHOTOSTABILITY TESTING OF TAMOXIFEN IN THE ORAL FORMULATION <b>FC5</b> AND STABILIZATION STRATEGIES.



- 17:40 ICH Q2(R2) AND Q14: THE NEW FRONTIERS.  
**OC15**  
*DINA CAVALLO - PRC TICINUM LAB NOVARA (ITALY)*
- 20:30 *SOCIAL DINNER*

## WEDNESDAY, SEPTEMBER 6<sup>TH</sup>

**Chair: Michele De Luca**

- 09:00 CHEMOMETRIC-BASED STRATEGIES FOR METABOLOMICS AND PHARMACEUTICAL ANALYSIS  
**PL3**  
*FEDERICO MARINI - SAPIENZA UNIVERSITY OF ROME (ITALY)*

### **Natural Products I**

**Chairs: Vincenza Andrisano and Clara Grosso**

- 09:45 Neuroprotective assessment of medicinal plant extracts.  
**KN9**  
*Clara Grosso - Polytechnic Institute of Porto (Portugal)*
- 10:15 Targeting PPAR- $\alpha$  and PPAR- $\gamma$  through AS-MS approach: two-dimensional chromatography for the affinity screening of bioactive components in natural  
**OC16** products.  
*Giulia De Soricellis - University of Pavia (Italy)*
- 10:35 Use of natural ingredients with antiviral activity in the production of nasal and oropharyngeal sprays for the prevention of flu syndrome resulting from Sars Cov2: the  
**OC17** cross-border 'SPRAY' project.  
*Luigi Panza - Consorzio IBIS Innovative Bio-based and Sustainable products and processes Novara (Italy)*
- 10:55 Polyphenols from *Cannabis sativa L.*: new methods for their extraction, analysis,  
**FC6** and evaluation of their antiproliferative activity against colorectal cancer.  
*Clarissa Caroli - University of Modena and Reggio Emilia (Italy)*
- 11:05 *Coffee break*

### **Natural Products II**

**Chairs: Federica Pellati and Dan Stærk**



11:25	BIOACTIVITY-CORRELATED ANALYTICAL TECHNIQUES USED FOR STUDYING BIOACTIVE DRUG LEADS <b>KN10</b> IN DESERT-LOVING <i>EREMOPHILA</i> SPP. <b>DAN STÆRK, UNIVERSITY OF COPENHAGEN (DENMARK)</b>
11:55	OPTIMIZED STRATEGY FOR THE ISOLATION OF ELENOLIC ACID (EA) FROM <i>OLEA EUROPEA</i> L. LEAF <b>OC18</b> <b>SERENA FIORITO - "G. D'ANNUNZIO" UNIVERSITY OF CHIETI-PESCARA (ITALY)</b>
12:15	MULTIDIMENSIONAL CHROMATOGRAPHIC FINGERPRINTING COMBINED WITH CHEMOMETRICS FOR
12:25	<b>BEST POSTERS AWARDS</b>
12:45	<b>CLOSING REMARKS</b>
13:00	<b>FAREWELL LUNCH</b>

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Technical Director  
Dr. Tosi Barbara  
Director Consorzio IBIS

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