



# ISTISAN CONGRESSI 18 | C2

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IX Seminar - PhD Day

## Filling the science communication gap

Istituto Superiore di Sanità  
Rome, May 17, 2018

### ABSTRACT

Edited by A. Rosso, S. Paone, G. Napoletani,  
S. Buezo Montero, G. Corano Scheri,  
R. La Russa, N.I. Sulemane, A. Mazzaccara



# ISTITUTO SUPERIORE DI SANITÀ

IX Seminar - PhD Day

## Filling the Science Communication Gap

Istituto Superiore di Sanità  
Rome, May 17, 2018

### ABSTRACTS BOOK

Edited by

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**IX Seminar - PhD Day. Filling the science communication gap. Istituto Superiore di Sanità. Rome, May 17, 2018. Abstract book.**

Edited by Annalisa Rosso, Silvio Paone, Giorgia Napoletani, Sara Buezo Montero, Giuseppe Corano Scheri, Raffaele La Russa, Nordino Ibraimo Sulemane and Alfonso Mazzaccara  
2018, vii, 70 p. ISTISAN Congressi 18/C2

The 9th Meeting of PhD students in Infectious Diseases, Microbiology and Health Sciences will be the usual mixture of studies in many areas of basic and applied research. And, as usual, we tried to find words able to summarize the main theme of the meeting. These words are all in the title: "Filling the science communication gap". Several questions: the first, are scientists able to communicate their results (and potential impact) the wide audience? Is people sufficiently skilled to understand them? The lack of communication may provoke a feeling of distrust with respect to science. On the other hand, the term Public Health contains in itself the word public, thus implying the involvement of people as subject or actor. We would like to deepen the connections between citizens and sciences, where communication, participation, awareness may be the keyword for reconstruct a sometimes complicated relationship.

*Key words:* Science, Communication; Microbiology, Communicable Diseases, Public Health, Social Medicine, Forensic Medicine

Istituto Superiore di Sanità

**IX Seminario di studio. Colmare le lacune della comunicazione scientifica. Istituto Superiore di Sanità. Roma, 17 maggio 2018. Riassunti.**

A cura di Annalisa Rosso, Silvio Paone, Giorgia Napoletani, Sara Buezo Montero, Giuseppe Corano Scheri, Raffaele La Russa, Nordino Ibraimo Sulemane e Alfonso Mazzaccara.  
2018, vii, 70 p. ISTISAN Congressi 18/C2 (in inglese)

La nona Giornata dei Dottorandi in Malattie infettive, microbiologia e sanità pubblica costituisce un momento di incontro per studi di diverse aree della ricerca di base e applicate. Come è prassi, abbiamo cercato di trovare le parole giuste per sintetizzare il tema dell'incontro. Questa volta sono tutte nel titolo: "Colmare le lacune della comunicazione scientifica". Alcune domande; la prima, i ricercatori sono capaci di comunicare le proprie scoperte a un pubblico ampio? E ancora, il grande pubblico ha gli strumenti per capirle? Questa mancanza di capacità comunicativa può determinare un sentimento di diffidenza nella scienza? D'altro canto, il termine stesso Sanità Pubblica contiene la parola pubblica, il che implica un coinvolgimento delle persone come soggetti o attori della ricerca. Cercheremo quindi di approfondire le connessioni tra il cittadino e la scienza, dove comunicazione, partecipazione e consapevolezza potrebbero essere le parole chiave per ricostruire un rapporto talvolta complicato.

*Parole chiave:* Scienza, Comunicazione; Microbiologia, Malattie Infettive, Sanità Pubblica, Medicina Sociale, Medicina Legale

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## PROGRAMME

### May 17, 2018

- 9.00 Registration
- 9.20 Preliminary welcome:  
**Walter Ricciardi, Carlo Della Rocca,  
Paolo Villari, Elio Ziparo, Stefano D'Amelio**
- 9.50 Lectio magistralis  
*Talking about science*  
**Chiara Lalli**

### Session 1

#### INFECTIOUS DISEASES, MICROBIOLOGY AND PARASITOLOGY

*Chairpersons: Catia Longhi, Lucia Nencioni, Anna Olivieri*

- 10.30 Lecture  
*Antimicrobial Resistance*  
**Nicola Petrosillo**
- 11.00 Poster session and new research topics  
Coffee Break
- Presentation of the studies of the PhD candidates
- 11.30 *Effects of oral probiotic administration on the health  
of female genital tract*  
**Daniela Capobianco**
- 11.45 *Tryptophan metabolism in HIV-1 infected patients:  
the role of probiotics on gut-brain axis*  
**Giuseppe Corano Scheri**
- 12.00 *High activity of n-acetylcysteine in combination  
with beta-lactam antibiotics against carbapenem-resistant  
Acinetobater baumannii and Kebsiella pneumoniae*  
**Massimiliano De Angelis**
- 12.15 *Double-carbapenem regimen, alone or in combination with colistin,  
in the treatment of infections caused by carbapenem-resistant  
Klebsiella pneumoniae (CR-Kp)*  
**Francesca Gizzi**



- 12.30 *Molecular surveillance of artemisinin resistance in Plasmodium falciparum isolates from malaria endemic areas of Africa*  
**Mariangela L'Episcopia**
- 12.45 *Effect of bovine lactoferrin on intestinal cells infected with adherent-invasive Escherichia coli*  
**Mellani Jinnett Scotti**
- 13.00 Lunch

## **Session 2**

### **HEALTH SCIENCES, ENVIROMENTAL CHEMISTRY, SOCIAL MEDICINE AND FORENSIC MEDICINE**

*Chairpersons:* **Maria De Giusti, Carmela Protano, Giuseppe Vetrugno**

- 14.00 Lecture  
*La comunicazione in sanità*  
**Emanuela Turillazzi**
- PhD candidates' communications
- 14.30 *Evaluation of occupational exposure to mycotoxins*  
**Francesca Debegnach**
- 14.45 *Informed consent and living wills: an innovative legislative moment in Italy*  
**Raffaele La Russa**
- 15.00 *Perfluorinated compounds Serum concentrations of among children living in Sicily (Italy)*  
**Caterina Ledda**
- 15.15 *Analysis of illicit drugs in oral fluids by means of UHPLC-HRMS: application on driving Under Influence of Drugs (Druid) cases and on wastes of DNA extraction*  
**Roberta Mazzoni**
- 15.30 *Screening for celiac disease among the personnel in service in an Italian armed force*  
**Mariateresa Panici**
- 15.45 *Biologic and biosimilars, legal and forensics issues*  
**Marco Valerio Sarra**

- 16.00 *Cultural competence perception of nurse  
and patient satisfaction with care*  
**Maria Ymelda Tolentino Diaz**
- 16.15 *Current delivery models for the provision of genetic testing,  
policy and evaluation of genetic services in Europe:  
a cross-sectional study*  
**Brigid Unim**
- 16.30 *Care associated infection (ICA): clinical risk assessment*  
**Annamaria Vullo**
- 16.45 *Conclusions*  
**Stefano D'Amelio**



**Session 1**

**Infectious diseases, parasitology and microbiology**

*Chairpersons:*

Catia Longhi, Lucia Nencioni, Anna Olivieri



# EFFECTS OF ORAL PROBIOTIC ADMINISTRATION ON THE HEALTH OF FEMALE GENITAL TRACT

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**Background.** The human body harbors microorganisms inhabiting surfaces exposed to the external environment. In particular, the human healthy vaginal microbiota, dominated by *Lactobacillus spp.*, is known to play a key role in preventing a number of sexually transmitted diseases. The depletion of lactobacilli and an increase of anaerobes can result in the switch from a normal vaginal microbiota to a dysbiosis, known as bacterial vaginosis, associated with a wide array of health issues. Since gut bacteria have been shown to colonize and influence vaginal microbiota, this study was conducted in order to assess the effect of a probiotic product administered orally on some of the parameters involved in vaginal health.

**Methods.** Twenty women (20-30 years old) without clinical genital signs and symptoms were enrolled. In order to avoid any bias due to hormonal influence on vaginal microbiota, start (T1) and end (T2) of probiotic treatment (60 days) and sample collection were scheduled during ovulation. Vaginal pH measurement, swabs (for leucocytes count, Trichomonas and Candida detection and Nugent score determination), vaginal fluid collection (for microbiota and bioactive molecules analyses) were performed at T1 and T2.

**Results.** At enrollment, despite the absence of clinical signs and symptoms, 7 women had Nugent scores of 4-10 indicating an altered microbiota (dysbiosis group) while the remaining had Nugent scores of 0-3 (healthy group). Six women had Candida, 2 Trichomonas and 4 showed >5 leukocytes/field. After probiotic administration Candida, Trichomonas and leukocytes were reduced by 66%, 100% and 50%, respectively. The results did not show changes in pH values, total bacteria and lactobacilli in the vagina (T1 vs T2) in the studied population. Interestingly, a reduction in the levels of  $\beta$ -defensin-1 ( $p=0.048$ ), lactoferrin ( $p=0.01$ ) and lactic acid ( $p=0.04$ ) and an increase in heat shock protein-70 ( $p=0.04$ ) was found. No differences were detected in the levels of  $\beta$ -defensin-2 and glycogen. The healthy group had a higher lactobacilli concentration than dysbiosis group both at T1 and T2 ( $p<0.001$  e  $p<0.01$ , respectively). Conversely, lactoferrin levels resulted higher in dysbiosis than in healthy conditions at both T1 and T2 ( $p<0.05$ ). Although inter-group differences in lactoferrin levels were maintained after probiotic treatment, a significant temporal reduction in dysbiosis group was found.

**Conclusions.** Oral probiotic treatment did not change vaginal microbiota composition in the whole population. However, the reduction of lactoferrin in dysbiosis group upon treatment could indicate a reduction in inflammatory conditions related to the altered vaginal microbiota.

# TRYPTOPHAN METABOLISM IN HIV-1 INFECTED PATIENTS: THE ROLE OF PROBIOTICS ON GUT-BRAIN AXIS

Giuseppe Corano Scheri (a), Ivan Schietroma (a), E. Nelson Cavallari (a), Saeid Najafi Fard (a), Claudia Pinacchio (a), Gabriella De Girolamo (a), Luca Laghi (c), Giancarlo Ceccarelli (a), Carolina Scagnolari (b), Gabriella d’Ettore (a), Vincenzo Vullo (a)

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**Background.** Alteration of tryptophan metabolism, which is caused by the activity of the interferon-inducible enzyme IDO-1, has an important impact on HIV-1 infected patients quality of life, in particular it could be involved in the onset of neurocognitive disorder. In fact, a number of study showed a correlation between an alteration in tryptophan metabolism, immune activation and neopterin production in the central nervous system. Dysbiosis and immune activation in HIV-1 infection are some of the main causes of IDO expression in the gastrointestinal tract. By modulating the gut flora with probiotics we hypothesized to impact on dysbiosis and on tryptophan metabolism, which doesn’t seem to be appropriately controlled by cART.

**Methods.** Thirteen HIV-infected subjects, under suppressive cART and undetectable viremia, underwent endoscopic procedures for the isolation of lamina propria lymphocytes (LPL), blood and faeces collection and lumbar puncture for cerebrospinal fluid (CSF) collection prior to initiation of probiotics supplementation (T0) and after 6 months (T6). CSF neopterin levels were measured by ELISA assay. IDO mRNA levels were measured by real-time PCR in both PBMC and LPL. IDO protein in LPL was measured through immunohistochemistry assay. Tryptophan level were quantified in the fecal samples through 1H-NMR analysis, and plasma serotonin levels were measured by ELISA assay. All measurements were performed at T0 and T6. Data were analyzed by Wilcoxon test.

**Results.** We found that plasma neopterin were significantly lower at T6 compared with T0. Moreover, a significant reduction in IDO mRNA expression in both LPL and PBMC at T6 is observed. A reduction of IDO protein in LPL, concordantly with mRNA reduction, is observed too. Finally, we observed a significant reduction of tryptophan in the feces and an increase in the levels of plasma serotonin, which is a direct product of tryptophan metabolism.

**Conclusions.** We highlighted a relationship between probiotic supplementation, inflammation and serotonin levels. Probiotic supplementation could reduce neopterin levels in CSF, modulate tryptophan metabolism and increase the levels of plasma serotonin, in order to reduce the side effects of the deregulation of tryptophan metabolism and its catabolites on the neurocognitive disorders of HIV-1 population.

# HIGH ACTIVITY OF N-ACETYLCYSTEINE IN COMBINATION WITH BETA-LACTAM ANTIBIOTICS AGAINST CARBAPENEM-RESISTANT ACINETOBACTER BAUMANNII AND *KLEBSIELLA PNEUMONIAE*

Massimiliano De Angelis, Alessandra Oliva, Maria Teresa Mascellino, Silvia Costantini,  
Claudio Maria Mastroianni, Vincenzo Vullo  
*Department of Public Health and Infectious Diseases, Sapienza University of Rome, Rome, Italy*

**Background.** Carbapenem-Resistant *Acinetobacter baumannii* (CR-Ab) and *Klebsiella pneumoniae* (CR-Kp) infections are associated with high morbidity and mortality, since therapeutic options are limited. The aim of the study was to evaluate the activity of NAC, alone and in combination with different antimicrobials, against clinical strains of CR-Ab and CR-Kp.

**Methods.** Over a 1-year period, 8 CR-Ab and 11 CR-Kp strains were collected from hospitalized patients at Sapienza University of Rome. For CR-Ab, MICs 50/90 of NAC, Meropenem (MEM), Ampicillin/Sulbactam (A/S), Colistin (COL), Rifampin (RIF) and Tigecycline (TIG) were determined by Broth Macro-dilution Method (BMD) whereas for CR-Kp MICs 50/90 of NAC, MEM, Ertapenem (ERT), RIF, TIG and COL were performed. Checkerboard method was used to evaluate the synergistic activity of the tested combinations against CR-Ab. Synergism was defined as FIC index  $\leq 0.5$ . Additionally, killing curves evaluating the activity of NAC alone and in combination with beta-lactams were performed against both CR-Ab and CR-Kp.

**Results.** CR-Ab strains were OXA producers. MICs 50/90 were 128/512  $\mu\text{g/mL}$  (MEM), 64/256  $\mu\text{g/mL}$  (A/S), 0.25/4  $\mu\text{g/mL}$  (COL), 2/4  $\mu\text{g/mL}$  (RIF), 0.5/1  $\mu\text{g/mL}$  (TIG), 2.5/5 mg/mL (NAC), while for CR-Kp MICs 50/90 were 256/1,024  $\mu\text{g/mL}$  (MEM), 1,024/2,048  $\mu\text{g/mL}$  (ERT), 16/128  $\mu\text{g/mL}$  (RIF), 0.5/1  $\mu\text{g/mL}$  (TIG), 256/2,048  $\mu\text{g/mL}$  (COL), 5/5 mg/mL (NAC). Considering CR-Ab, the synergism was observed in 87.5% (MEM+NAC), in 75% (A/S+NAC), in 62.5% (RIF+NAC), whereas for COL+NAC and TIG+NAC only additivity was found (87.5% and 62.5%, respectively). Given the high activity of NAC plus beta lactams for both CR-Ab and CR-Kp, these combinations were tested in killing experiments. In the killing curves, NAC alone exhibited a full bactericidal activity in the first 2h at 5 mg/ml against CR-Ab as well as CR-Kp. When tested at sub-inhibitory concentrations in combination with concentrations obtainable in the serum of MEM, a high bactericidal and synergistic activity at 24h was observed, with absence of bacterial growth up to 16  $\mu\text{g/mL}$  of MEM.

**Conclusions.** NAC exhibited a remarkable synergistic and bactericidal activity in combination with beta-lactam antibiotics used in therapy to fight CR-Ab and CR-Kp infections. Given its safety profile, the addition of NAC as a part of combination therapy against difficult-to-treat infections caused by CR Gram negatives might be considered a valid therapeutic option.



## **DOUBLE-CARBAPENEM REGIMEN, ALONE OR IN COMBINATION WITH COLISTIN, IN THE TREATMENT OF INFECTIONS CAUSED BY CARBAPENEM-RESISTANT *KLEBSIELLA PNEUMONIAE* (CR-KP)**

Francesca Gizzi, Alessandra Oliva, Laura Scorzoloni, Maria Teresa Mascellino, Alessandra D'Abramo, Claudio Maria Mastroianni, Vincenzo Vullo  
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**Background.** Infections caused by CR-Kp represent an emerging threat due to high mortality rate and limited therapeutic options. Although considered as part of antimicrobial combinations against CR-Kp, colistin use might be limited by its potential nephrotoxicity and resistance; thus, colistin-free unconventional approaches have recently been proposed. In our study we evaluated the clinical effectiveness and the *in vitro* activity of the double Carbapenem (DC) regimen [Ertapenem (ERT) plus high dose of Meropenem (MEM)], alone or in combination with Colistin (COL).

**Methods.** We enrolled 32 patients with CR-Kp infection: 18 treated with the DC regimen and 14 with DC + COL.

**Results.** *In vitro* studies included phenotypic determination of carbapenemases and evaluation of MEM + ERT and COL + MEM + ERT synergism throughout killing studies. Overall clinical success was achieved in 75% of subjects. No statistical difference was found between the 2 groups regarding early response to therapy and mortality at 60-days. We showed that the addition of COL to the DC regimen obtained a rapid bactericidal activity, which might be crucial in severe infections, where a rapid antibacterial effect is auspicious to improve the outcome of patients. Our results could lead to the hypothesis that starting with an aggressive treatment of COL + MEM + ERT followed by a therapeutic switch to a less toxic regimen (i.e. the DC regimen) might be a reasonable option against systemic infections caused by CR-Kp.

**Conclusions.** One of the major features of our study is the presence of both clinical and *in vitro* results. In an era in which traditional antimicrobial susceptibility reports seem to be no longer informative, *in vitro* synergy studies could represent an additional tool to guide treatment decisions and predict the potential clinical efficacy of the chosen combination. In conclusion, we demonstrated that both the double-carbapenem alone and the double-carbapenem regimen plus colistin were clinically and microbiologically effective in the treatment of infections caused by CR-Kp. MEM + ERT might be a valid therapeutic option when COL use is discouraged whereas COL + MEM + ERT might be considered in subjects with more severe conditions, where an early clinical response is auspicious.

# MOLECULAR SURVEILLANCE OF ARTEMISININ RESISTANCE IN *PLASMODIUM FALCIPARUM* ISOLATES FROM MALARIA ENDEMIC AREAS OF AFRICA

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(h) Unité Biologie des Interactions Hôte-Parasite, Institut Pasteur, Paris, France

**Background.** Artemisinin-based Combination Therapy (ACT) is the most effective anti-malarial treatment for *Plasmodium falciparum* malaria. Unfortunately, the emergence in Southeast Asia of *P. falciparum* parasites resistant to artemisinins poses a threat to malaria control and prevention efforts. Several Single Nucleotide Polymorphisms (SNPs) in the *P. falciparum kelch 13 (Pfk13)* gene have been associated to artemisinin resistance but no one of these has been linked to artemisinin tolerance or resistance.

**Methods.** In this study, we screened by PCR and direct sequencing 928 *P. falciparum* isolates collected in 4 African countries in which malaria still represents a major public health problem to investigate the presence of point mutations in the *P. falciparum K13* gene. For the 148 Eritrean samples, the *Pfk13* gene screening was also supported by a Next Generation Sequencing (NGS) analysis. Amplification and polymorphisms in *Pfmdr1* gene were analyzed to monitor the possible emergence of the amodiaquine and lumefantrine resistance. In collaboration with the CDC malaria team, a photo-induced electron transfer real time PCR (PET-PCR) to quantify the number of copies of plasmepsin 2 gene (*Pfpm2*) in *P. falciparum* isolates was also designed.

**Results.** No evidence of mutations associated with artemisinin resistance were observed. However, for the Eritrean samples, eleven non-synonymous and two synonymous polymorphisms that have not been linked to artemisinin resistance were observed in *Pfk13* gene with the NGS approach.

**Conclusions.** These preliminary results, suggest the strong need for a systematic molecular surveillance and drug efficacy evaluation to develop treatment and prevention guidelines for malaria.

# EFFECT OF BOVINE LACTOFERRIN ON INTESTINAL CELLS INFECTED WITH ADHERENT-INVASIVE *ESCHERICHIA COLI*

Mellani Jinnett Scotti, Maria Pia Conte, Maria Stefania Lepanto, Massimiliano Marazzato,  
Luigi Rosa, Piera Valenti

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**Background.** Adherent-Invasive *Escherichia coli* (AIEC) is a pathogen known to be involved in the Crohn's Disease (CD). A detailed study of the AIEC strain LF82 revealed that it is able to adhere to and to invade enterocytes, to survive and replicate within human cells without causing cell death and to induce genotoxicity. Recently, bovine lactoferrin (bLf), a cationic glycoprotein with antibacterial and anti-inflammatory activities, showed to be able to inhibit adhesion and internalization of facultative intracellular bacteria, including LF82. This study is aimed at evaluating the effect of pretreatment of Caco-2 cells with bLf on the ability of this strain to invade and survive intracellularly and cause genotoxicity as well as to understand the molecular mechanism involved.

**Methods.** Caco-2 cell line was differentiated for 15 days before infection. When required monolayers were pre-stimulated for 12h with bLf. To evaluate the invasion and intracellular survival of LF82, at the end of the treatment cell monolayers were lysed 4 and 24h post-infection. Moreover, we studied the ability of LF82 to induce apoptosis by fluorescence assay and to modulate the production of cytokines Interleukin (IL)-1 $\beta$ , 6 e 8 by ELISA test. Considering that LF82 enhance the adhesion and invasion through CEACAM6 receptor on the enterocytes, we tested the effect of bLf on this receptor by western blot technique. Furthermore, we evaluate if bLf influence the genotoxic activity induced by LF82 on Caco-2 cells using the comet assay.

**Results.** LF82 is able to invade and survive in Caco-2 cells and bLf monolayers treatments reduced the invasion and intracellular survival of about 79% ( $p < 0.0001$ ) and 41% ( $p < 0.0001$ ), respectively. The results obtained clearly demonstrated that apoptosis is not involved in the decrease of LF82 intracellular survival. For what it concern cytokines, our results indicate that bLf down-regulate only IL-6 levels ( $p < 0.001$ ). The analysis of CEACAM6 on Caco-2 cells (infected or not) revealed that bLf does not influence the expression of this receptor. In contrast, comet assay evidenced shorter DNA tails in cells pretreated with bLf ( $p < 0.008$ ).

**Conclusions.** The results obtained suggest that bLf pretreatment induces a protective effect reducing the ability of LF82 to invade and survive intracellularly. Analyses of apoptosis and CEACAM6 receptor indicated that they are not involved in the mechanism of protection of bLf. Furthermore, levels of IL-6 decreases by the action of bLf between on cells pretreated or not, indicating an anti-inflammatory effect of bLf. Interestingly, bLf exerts a protective effect against double-strand breaks in DNA produced by LF82. The molecular mechanism of bLf continues to be an open question that needs further study.

**Session 2**

**Health sciences, environmental chemistry,  
social medicine and forensic medicine**

*Chairpersons:*

Maria De Giusti, Carmela Protano, Giuseppe Vetrugno



# RESILIENCE AND RELATIONSHIP WITH: QUALITY OF LIFE, MARITAL SATISFACTION, AND DEPRESSION IN COUPLES WITH FEMALE BREAST CANCER UP TO TWO YEARS OF DIAGNOSIS

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**Background.** Within the main characteristics of a diagnosis of female breast cancer is the impact in different areas of the woman and her partner. Two years after the diagnosis, the evidence shows a bidirectional relationship between psychological stress (distress), and the physical illness, increasing these destabilizing over time, thus compromising the relationship and the balance of the day. The results show that: in some couples, it weakens the link dyadic and in others, this link is strengthened with the traumatic experience lived by the disease, developing in the couple, the ability resilient to continue projecting in the future despite events destabilizing”. From these approaches, it is a priority to study resilience as an alternative method to counteract the effects generated by the cancer of the breast, exploring other ways of serving and understanding the trauma. To determine the relationship among resilience, quality of life, marital satisfaction, and depression in couples with cancer of the female breast to two years of diagnosis in the departments of Nariño and Putumayo (Colombia), 2018.

**Methods.** Exploratory study descriptive, which used quantitative methods and evaluated the correlation of variables. 150 couples in the areas of Nariño and Putumayo that are selected intentionally, with a diagnosis of more than 24 months. The participants are heterosexual couples, where the woman has been diagnosed with breast cancer in the past two years. Exclusion criteria were couples who, in the course of the investigation the woman has a relapse that required hospitalization.

**Results.** To contribute to the development of knowledge from the vision of Nursing within the public health in the area of oncology, and mental health care policies in the different stages of care. Knowing the processes faced by the dyad before this disease, you will be able to guide and promote intervention strategies that improve the quality of life, marital satisfaction, and the aspect of emotional (depression) based on the resilience of partner recognizing the partner as a protective factor in the development of the intervention process.

**Conclusions.** Nursing can be a figure of the “tutor of resilience”, applied, not only in the clinical part if you don't add the part relational, strengthening the strategies of coping dyadic through a counseling active.

## EVALUATION OF OCCUPATIONAL EXPOSURE TO MYCOTOXINS

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**Background.** Feed mill workers handle or process high quantity of maize that may be contaminated with Aflatoxins (AFs), a well-known mycotoxin classified by IARC as carcinogenic to humans; this condition may lead to an intake of toxins deriving from occupational exposure.

**Methods.** Preliminary data for this PhD project derives from the analyses on urine and serum samples performed by ISS in the framework of a closed research project coordinated by the AUSL Reggio Emilia and supported by Emilia-Romagna region, where occupational exposure was assessed in a group of workers during 2012/2013. In this first project no serum sample was found to be positive, while 74% of urine samples revealed AFM1 presence. Slightly higher AFM1 concentration levels were assessed in exposed workers than controls, but these differences are to be considered consistent with random fluctuations. A new set of urine and serum samples of exposed workers and controls were collected in October 2017. The analyses were conducted with LC-HRMS Orbitrap in order to measure AFB1 and AFM1, and to evaluate the presence/absence of the AFB1-guanine adduct in urine and AFB1 and AFB1-Lysine adduct in serum. The set-up of the method for urine analysis included the comparison of two different approaches (i) the direct injection of the diluted urine and (ii) the injection of the sample after an immunoaffinity column (IAC) purification step. The two methods were fully validated and the performances of all the evaluated parameters were satisfactory.

**Results.** None of the urine samples was contaminated with AFB1 or AFB1-Guanine adduct, while the 12% were positive for AFM1 (only one sample being higher than the limit of quantification). However, the differences of mean values between control and exposed groups were not statistically significant ( $p > 0.05$ ). Since the prevalence of positive samples was considerably lower when compared with the results obtained in the previous survey, it was decided to study the stability of AFM1 in urine samples stored at different temperature over a defined period of time. These stability study is still ongoing.

**Conclusions.** The next step of this survey is the analysis of an additional group of mycotoxins (and related metabolites) of concern to human health in urine and serum samples. More in detail the determination of deoxynivalenol and its metabolite deepoxy-deoxynivalenol will be conducted on urine samples, while ochratoxin A will be measured together with AFB1 and AFB1-Lysine adduct in serum.

## INFORMED CONSENT AND LIVING WILLS: AN INNOVATIVE LEGISLATIVE MOMENT IN ITALY

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**Background.** On December 14, 2017 the Senate approved the text already voted by the Chamber of Deputies on the issues of the end-life. The promulgation of the law will be a crucial novelty for Italy that had not yet expressed explicit regulatory provisions on the matter, although during the previous legislatures initiatives were recorded in aim to introduce a legislation on this issue.

**Methods.** The purpose of the work is to briefly outline the historical and social context of the current text, analyzing its content. The result is an overall positive assessment about the innovativeness of its principles and the intention to provide solutions that can be used in concrete cases. There are, however, ambiguities and omissions that risk limiting the effectiveness of the rule, compared to the original ratio.

**Results.** The aim of the text is stressed in the first and fourth articles, respectively on "informed consent" and "living wills". In fact, the legislator understood how, in order to regulate the end-life, it was essential to standardize informed consent on the basis of articles 2, 13 and 32 of the Italian Constitution. Informed consent is the founding act of doctor-patient relationship, representing the link between patient's right to self-determination and medical profession. Moreover, article 2 forbids therapeutic obstinacy and legitimizes deep terminal sedation. In doing so, patient's right to self-determination, dignity and well-being are guaranteed. Article 3 points out some applicative aspects of the principles referred to in article 1 regarding minors, interdicted and incapacitated. Article 4 focuses on living wills, providing its operative definition as an instrument available to every person of age, fit to plead. Furthermore, in this article, reference is made to the figure of the trustee in the health context and his task to relate with doctors and structures. From this law on living wills, it transpires a certain progressive reformism with respect to the ethical and juridical dimension of our country. Firstly, paragraph 1 gives full legitimacy to anticipated provisions, without any other condition than the legal capacity and age of the person who expresses them. However, the nature and content of the living wills are summarized in a rather synthetic way according to their purpose and relevance.

**Conclusions.** Although introducing new aspects to the current regulation, there are still some inconsistencies. Nevertheless, we can only appreciate this law since it constitutes a sure advancement for our system in the direction of modernity and protection of human rights.



## PERFLUORINATED COMPOUNDS SERUM CONCENTRATIONS OF AMONG CHILDREN LIVING IN SICILY (ITALY)

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**Background.** Perfluorinated compounds (PFCs) are a large group of man-made chemicals characterized by a completely fluorinated hydrophobic linear carbon chain attached to a hydrophilic head. The presence of PFCs has been related with various adverse effects on several organs and systems.

**Methods.** 61 children (6 to 11 years of age) living in Sicily underwent a medical examination and blood and urine routinary tests, as well as the serum concentration of 16 PFCs.

**Results.** These compounds ( $\Sigma$ PFCs=5.888 ng/mL, range 1.035-12.94 ng/mL) were widely detected in the samples of all children, showing that they had been extensively exposed to PFCs, especially for PFOS, PFOA, PFHxs and PFDA. In addition, long-chained PFCs were found in children's blood correlated with short-chained ones. PFDA (beta=-0.114) and PFHxS (0.003) levels were correlated with maternal parity; while the variable "months of breastfeeding" is correlated with PFUnDA concentrations (beta=0.008). Female gender is negatively associated with PFOS (beta=0.008).

**Conclusions.** The adverse health effects of PFCs on young children should be noted, due to their growing phase. Therefore, further studies are needed to monitor and address adverse health outcomes of PFCs on children, especially those living in industrial regions.

# ANALYSIS OF ILLICIT DRUGS IN ORAL FLUIDS BY MEANS OF UHPLC-HRMS: APPLICATION ON DRIVING UNDER INFLUENCE OF DRUGS (DRUID) CASES AND ON WASTES OF DNA EXTRACTION

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**Background.** In 2010, the Italian “street code” was modified regarding the regulation of “driving under the influence of drugs” but yet in 2018, the underlying problem of drug-driving has not been solved due to many reasons and a straightforward procedure for Police Forces to contrast this phenomenon does not yet exist.

**Methods.** This research project: 1. assessed those issues related to legal, scientific and economic aspects; 2. evaluated the three most sold “roadside oral fluid screening” in Italy from scientific, usability and cost perspectives; 3. defined an operative protocol aiming at spotting DRUIDs according to Italian law (art. 187 Codice della Strada), including:

- “on the street oral fluid collection” procedure by using oral swabs;
- chemical-analytic method for qualitative-quantitative analysis of drugs in oral fluid based on UHPLC-MS-Orbitrap (Ultra High Pressure Liquid Chromatography - Mass Spectrometry), validated according to SWGTOX (Scientific Working Group for Forensic Toxicology) Guidelines, in order to confirm the presence of drugs previously detected by “roadside oral fluid screening”.

The whole procedure was tested by using 100 “roadside oral fluid screening” for each type on actual cases collected on streets of Rome.

**Results.** The same oral swabs can be used as well to collect saliva on crime scenes or dead bodies in order to perform biological forensic analysis. The aim of the project is now extended at developing and validating a chemical-analytic method for qualitative-quantitative analysis of drugs in wastes of DNA extraction and purification procedure.

**Conclusions.** The assessment of biological fluids characteristics has confirmed saliva to be the ideal choice for conducting analysis related to the use of drugs within the last 24 hours due to the following advantages related to saliva collection that is:

- not-invasive from a legal standpoint;
- less risky for the officer in charge and it does not require specific skills;
- less expensive and faster.

Next target is to validate a method that enables to detect drugs from the same saliva sample previously used to perform DNA analysis.

## SCREENING FOR CELIAC DISEASE AMONG THE PERSONNEL IN SERVICE IN AN ITALIAN ARMED FORCE

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**Background.** Celiac Disease (CD) is an inflammatory life-long enteropathy, whose prevalence in Italy is roughly 1%. CD shows up with signs and symptoms ranging from mild to very severe. In the latest years, a growing number of asymptomatic patients have been diagnosed with CD in the course of screening programs among general population or CD first-degree relatives. To study the CD prevalence among the personnel of an Italian armed force. This population has been identified as target of a CD screening because the militaries undergo a check-up at the enrolment to state their physical ability to serve and they carry out a physical demanding job.

**Methods.** The study is approved by the ISS Ethical Committee (568/16). All the personnel admitted to the Health Service of an Italian Armed Force since February, 01 2017 is asked to participate. Their plasma is tested anti-tG IgA levels by an ELISA kit (Eurospital, Trieste, Italy; cut-off 9 UI/ml). Positive individuals are investigated for EMA and eventually, duodenal biopsy. A questionnaire with the relevant clinical information is filled out by the enrolled individuals.

**Results.** At the moment, 384 (331 M, 53 F age range: 18.2-66.5 ys) were enrolled and the plasma of 313 (270 M, 43 F age range: 18.2-66.5 ys) of them were analyzed. One military had a known diagnosis of CD (M, 32 ys). Seven militaries were found to have a plasma titer higher than the cut-off level. Five had a CD diagnosis confirmed by the duodenal biopsy (3M, 2F). The questionnaires have not yet been analyzed.

**Conclusions.** The CD prevalence among military personnel, so far, is 1.9%, quite similar to that resulted from some screening in the general population.

## **BIOLOGIC AND BIOSIMILARS, LEGAL AND FORENSICS ISSUES**

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**Background.** The expiration of patents of the first biologic, after 30 years, created the opportunity to develop drugs so called Biosimilars, or similar drugs to a reference biologic product already authorized in the EU and for which the copyright has expired. The possibility of the introduction of such drugs, and its expense reduction for the National Health Service (at least 20%), it gave fount to a broad and thorough debate on their usefulness and their automatic substitution to the originator. The marketing of biosimilars, and biologic ones, in Europe is authorized by the European Medicines Agency (EMA), but the evaluation of automatic substitution is left to the individual national Authority, in Italy AIFA. The latter has published a first position paper in which substantially excluded automatic substitutability, since the "reference biological medicinal products and biosimilar medicines are similar, but not identical"; now it prepares to publish a second position paper, which, at present, has such founding and innovators points compared to the first one: a) does not make mention of naive patients, while previously infer that the biosimilars were basically meant for such patients; b) it overlaps the therapeutic efficacy and safety that had once biosimilar recognized by the EMA, extending also this principle to the extrapolating the of therapeutic indications, its EMA that establishes whether the therapeutic indications originator can be transferred to its biosimilar; c) it leaves in any case, the decision on the introduction or moving between a biological and a biosimilar, the prescribing physician, considering, however, the biosimilar therapeutic option for which the risk-benefit ratio is the same as that originator of the corresponding reference.

**Methods.** In anticipation of the new AIFA document, however, unchanged problems still remain, the object and purpose of the research, linked to the introduction in the calls for tenders of original drugs and biosimilars competing with each other, a problem whose solution is crucial in programming, national and regional levels, the health economic measures, also inextricably linked to the use of appropriate and sustainable biosimilars

**Results.** Currently, without considering the administrative judicial appeals concluded or still pending, there is an absolute difference in treatment between the various Regions, such as the guarantee of the continuity of care, expected only in 10 Regions examined on 17 and in the remaining seven, only three foresee that the use of the originator ought to be justified by clinical motivation.

# CULTURAL COMPETENCE PERCEPTION OF NURSE AND PATIENT SATISFACTION WITH CARE

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**Background.** Healthcare professionals and patients live differences that are part of the process of social and cultural development in the world. It is crucial to understand the process of evaluating cultural patterns and factors that influence individual and group differences and preventing generalizations and stereotypes to reduce disparities in access to health care. Cultural competence occurs when health professionals work effectively in respect and within the patient's cultural context. The quality of care and the nurse-patient relationship improve when nurses and other professionals strive to understand the values, beliefs and ways of life of the patient. This study aims to assess the cultural competence of nurses and the perception of patients about it, as well as the satisfaction of received care.

**Methods.** The descriptive study was carried out in the Local Health Authority Rome 2 and the San Giovanni Addolorata Hospital in Rome from March 2017 to February 2018. The tools chosen to conduct the survey are the CCATool Cultural competence Assessment Tool - Italian version, and the SCCI Scala delle Competenze Culturali Infermieristiche - modified Italian version nurses and patient satisfaction - PCCPS.

**Results.** The study involved 192 nurses and 148 patients. The average age of professionals was  $46.2 \pm 7.9$  years and the average age of patients was  $35 \pm 11$  years. Most of the nurses (77.6%) and of the patients (85.8%) were female. The nurses had an average work experience of  $21.4 \pm 8.8$  years; 79.3% of them worked in a hospital. About 34.8% of patients came from Europe, 29.1% from Africa, more than 19.6% from Asia. The 65.4% of the nurse sample have never attended any kind of multicultural course. About 42% of nurses consider themselves "neither competent nor incompetent", 24% "sometimes competent" and only 12% "very competent" about their own cultural competence. More than 54% of patients report a good overall satisfaction level about the quality of received nursing care. Patients refer a good perceived level of nurse interest about: patient's nationality (36.5%), origins (35.2%), religion (37.8%), culture (33.8%), eating habits (41.9%), knowledge of Italian language (41.9%). Patients have a good opinion about nurses' technical skills (52.7%) and behavior (60.1%).

**Conclusions.** The analysis of these surveys shows that, even though most patients are satisfied of the quality of received care, there is the need for nurses to acquire more training on cultural diversity with a focus on specific competences. Although a greater knowledge of specific cultures may be useful, it could be self-defeating whenever it orients to a stereotyped kind of assistance, losing sight of inter-individual variability.

# CURRENT DELIVERY MODELS FOR THE PROVISION OF GENETIC TESTING, POLICY AND EVALUATION OF GENETIC SERVICES IN EUROPE: A CROSS-SECTIONAL STUDY

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**Background.** The provision of genetic services, along with the research in the field of genomics and genetics, has evolved in recent years to meet the increasing demand of consumers interested in genomic prediction of diseases and various traits. The aim of the study is to identify existing genetic service delivery models, policies governing the use of genomics medicine, and measures to evaluate genetic testing and related services in Europe.

**Methods.** An ad hoc questionnaire was designed and administered online to European experts with a good knowledge about the provision of one of the four selected genetic tests (BRCA1/2, Lynch syndrome, familial hypercholesterolemia, inherited thrombophilia), engaged in policy planning or evaluation of genetic services. A quali-quantitative analysis of the survey results was performed.

**Results.** Experts from 12 EU countries (Czech Republic, Estonia, France, Hungary, Ireland, Italy, the Netherlands Poland, Portugal, Spain, Sweden, and UK) were contacted. The main delivery models for the four tests in all countries were genetic services led by geneticists and by medical specialists. Genetic services integrated into population screening programs and direct-to-consumer services were infrequent; the experts never indicated genetic services led by primary care physicians. All countries have a national plan aimed at planning and designing health and social services for rare diseases. A dedicated plan for Public Health Genomics is in place in two countries (France, Italy) and under development in other two (Spain, UK). Legislations governing the practice of non-medical healthcare professionals involved in medical genetics are in place in six countries (Hungary, Czech Republic, France, Portugal, UK, and the Netherlands). Accreditation and participation of genetic laboratories in external quality assessment schemes is mandatory in four countries (Czech Republic, France, UK, Netherlands). Morbidity and mortality data related to genetic diseases are routinely collected in two countries (Czech Republic, Hungary). Nevertheless, they are not used as outcome measures of genetic services. An information flow directing data from genetic services to regional or national level to support activities such as health planning, control or evaluation seems to be lacking in all countries.

**Conclusions.** Current models of genetic services require the integration of genetics in all medical specialties, collaboration among different healthcare professionals, and redistribution of professional roles. Policies on genetic testing are not uniformed and standardize methods for monitoring complex pathways involving medical genetics are lacking in all countries. Major efforts are required for the regulation of genetic services in Europe without jeopardizing quality standards.

## **CARE ASSOCIATED INFECTION (ICA): CLINICAL RISK ASSESSMENT**

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**Background.** The aim of this study is to evaluate the risk of care associated infection (ICA) during the ordinary activity.

**Methods.** The study include a retrospective analysis about epidemiological and statistical data collected by simple operative unit (UOS) of Igiene and hospital techniques at Sant'Andrea Hospital in Rome. The time of observation included five years 2011-2015. The cases were 2,495 patients (53% male and 47% female) and were collected in clinical Departments. The analysis was elaborated on 255 records: 21 are related to professional responsibility and 21 to ICA.

**Results.** By our preliminary results we speculate the importance of the quality of the hospital assistance; in particular we observed a higher risk of infection in the patients with deteriorated clinical condition. Moreover the correct application of the protocols for the use of disinfectants and antibiotics, the respect of criteria for the use of drugs and invasive procedures plays an important role as regards the transmission of pathogens and causes of ICA.

**Conclusions.** the adoption of a risk management policy based on the synergy between risk assessment adhering to the real business context and the adoption of appropriate organizational models (Procedures-Protocols) as well as future regulatory references being approved by the Senate acts for the prevention and control of the ICA. It will represent the best strategy by the Hospital Companies will be able to guarantee the quality of the assistance and where it is necessary to demonstrate in court the correctness and completeness of the clinical and organizational models adopted.

**Poster session**





# HEALTH-RELATED QUALITY OF LIFE AMONG ITALIAN UNIVERSITY STUDENTS

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**Introduction.** The UK titled it “student mental health crisis”. The decline of student’s health is not a new phenomenon anymore. Poor health and low quality of life cannot only affect students’ academic achievement but also their long-term health and wellbeing. In respect of universities, promoting health means endorsing human development and effective learning. Vice versa, education is a significant predictor of quality of life and health. Yet, students’ health is often underestimated and factors influencing student’s health are unclear.

**Objective.** The purpose of the present study was to determine Italian university students’ HRQL, including the mental composite summary (MCS12) and physical composite summary (PCS12), their adherence to the Mediterranean Diet and to explore factors associated with HRQL.

**Methods.** A multi-center cross-sectional study in a sample of Italian university students was conducted. Data about age, gender, year of program course, study program, HRQL and dietary habits was collected using a self-administered questionnaire. MCS12, PCS12 and Mediterranean Diet Score (MDS) were calculated. Descriptive statistics, univariate and multiple logistic regression analyses were performed. Analysis was stratified by age and sex.

**Results.** 1864 university students, aged between 19 to 30 years, participated in the study. Students showed relatively poor HRQL, with an overall MCS12 score of 41.3% ( $\pm 10.0$ ) and PCS12 score of 52.9% ( $\pm 6.0$ ). A significant difference was found among gender with male students scoring higher on MCS12 compared to women ( $p < 0.005$ ). Average MDS Score was 5,3 ( $\pm 1.8$ ). Studies such as economics and law ( $b = -2.513$ ,  $p = 0.007$ ) and engineering ( $b = -2.762$ ;  $p = 0.001$ ) were significantly associated to negatively influence MCS12.

**Discussion.** The study’s cross-sectional nature did not allow to make inferences about causality or temporal ordering of variables. Furthermore, the study did not evaluate any other additional covariates that might influence students’ health such as the quality of relationships to friends and family. In order to solve remaining questions a panel-data study that will be conducted 2018.

**Conclusion.** The present study gives first indications on students’ health. HRQL of university students can be greatly affected by the presence of mental health issues and other lifestyle factors. However, further studies investigating other essential socio-demographic variables are necessary to fully understand students’ health, and to implement appropriate health promotion strategies. Finally, students’ health should be at the top of the agenda of public health researchers, academic supervisors and policy-makers.

## ASSESSMENT OF BIVENTRICULAR FUNCTION IN HUMAN IMMUNODEFICIENCY VIRUS INFECTION BY THREE-DIMENSIONAL SPECKLE TRACKING ECHOCARDIOGRAPHY

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**Background.** The purpose of the study was to assess biventricular parameters of wall deformation with three-dimensional speckle tracking echocardiography (3DSTE) in patients with human immunodeficiency virus infection (HIV) on antiretroviral therapy in order to detect a possible subclinical myocardial dysfunction.

**Methods.** Nineteen patients aged 12 to 35 years with HIV acquired early in life and 19 normal controls of the same age and sex were studied with 3DSTE. All HIV patients were stable in terms of HIV infection, with no history of heart disease or other chronic systemic disease except HIV infection. Patients were on HAART with good immunological control. Standard echocardiographic measures of LV-RV function were assessed. LV global longitudinal strain (GLS), circumferential and radial strains were calculated. Global area strain (GAS) was calculated by 3DSTE as percentage variation in surface area defined by the longitudinal and circumferential strain vectors. Right ventricular (RV) 3D global and free-wall longitudinal strain were obtained.

**Results.** LV GLS and GAS were lower in HIV patients compared to normal controls ( $p=0.016$ , and  $p=0.003$ , respectively). There were no significant differences in ejection fractions between the groups. There was a positive correlation between LV GLS and age ( $r=0.453$ ,  $p=0.032$ ) and a negative correlation between LV GLS and CD4 T-cells count ( $r=0.312$ ,  $p=0.041$ ). LV LS impairment was more evident in basal and apical regions. RV free-wall longitudinal strain was significantly reduced in HIV patients when compared with the control group ( $p=0.019$ ). No patient had pulmonary systolic pressure higher than 35mmHg.

**Conclusions.** Three-dimensional speckle tracking echocardiography may help to identify HIV patients at high cardiovascular risk allowing early detection of biventricular dysfunction in the absence of pulmonary hypertension.

## **NEUROIMAGING OF PSYCHOPATHY: FUNCTIONAL MRI ALTERATIONS IN SOCIALLY DANGEROUS PATIENTS WITH DIMINISHED PENAL RESPONSIBILITY**

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In the last decades neuroimaging techniques have been broadly used to investigate neuropsychiatric disease. Beside conventional morphologic Magnetic Resonance (MR) sequences used in clinical routine to assess parenchymal alterations or structural brain disease, functional Magnetic Resonance Imaging (fMRI) have shown altered functional connectivity of brain regions during the resting-state in several psychiatric disorders.

Previous researches on criminal offenders with psychopathic traits, showed that subjects with antisocial behavior are characteristically associated with abnormal moral behavior. Recent studies using fMRI have also provided strong evidence of abnormalities in the connectivity of numerous cortical and subcortical brain regions. Particularly, the emotional detachment in adult psychopaths seems to be associated with a specific brain network involved in moral judgment: the so-called “Default Mode Network” (DMN). During wakeful rest, network’s components normally show active connections and synchronized activity fluctuations concerning self-referential aspects of thinking and sensations.

We started an observational study including 9 adults male prison inmates (mean age 43 yo) recruited in the R.E.M.S. (Residences for Execution of Security Measures) of ASL Rm5, evaluated with specific psychiatric and neurocognitive scales; psychopathy was evaluated with the Hare’s Psychopathy Checklist-Revised (PCL-r). All patients underwent a multiparametric MR examination, performed on a 3T Magnet (Siemens Verio), in order to evaluate functional connectivity within the brain. Control group include 10 healthy men (mean age 35.5) that never received a psychiatric diagnosis/psychiatric treatment and were never convicted for crimes.

Preliminary data suggest that affective-interpersonal and lifestyle-antisocial facets of psychopathic traits may be correlated with altered patterns of neural connectivity, with significant social implications. These initial results will deserve future investigation: advances in the assessment of psychopathy could be very useful in forensic psychiatry, in relation to legal, ethical and research aspects. Furthermore, the multidisciplinary approach will provide innovative information over current state of the art, improving the knowledge about neural correlates of psychopathy.

# IMPORTANCE OF FECAL PHENYLALANINE/TYROSINE RATIO IN HIV POPULATION WITH NEUROCOGNITIVE IMPAIRMENT

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**Background.** Cognitive impairment, most commonly in the form of Asymptomatic Neurocognitive Impairment (ANI), persists in the cART era. The altered fermentation process in the intestine and the lack of molecules with neurotropic properties play a role in the pathogenesis of these deficits. We evaluated the effects of supplementation with a probiotic formulation on fecal Phenylalanine (Phe)/Tyrosine (Tyr) ratio and Tryptophan (Trp) levels as well as on the neurocognitive function in HIV infected patients with ANI.

**Methods.** 15 HIV positive subjects on effective antiretroviral therapy underwent neurocognitive evaluation and fecal sampling at baseline (T0) and after 6 months (T6) of therapy supplementation with a multistrain probiotic formulation. A control group of 15 healthy donors was included in the study; controls underwent fecal sampling at T0. The neuropsychological tests battery included: Rey-Osterrieth Complex Figure Test, Rey Auditory Verbal Learning Test, Test of Weights and Measures Estimation, Visual Search Test (Attention Matrices Test), Verbal Fluency test, Test of Phonological and Semantic Verbal Fluency, Raven's Standard Progressive Matrices, Digit Span test, Corsi Block Tapping Test, the Aachener Aphasia Test and the Trail Making Test A and B. Metabolomics analysis was performed by <sup>1</sup>H-NMR on all fecal samples collected at T0 and T6.

**Results.** At T0, all HIV positive participants showed impaired results in at least one neurocognitive test with most subjects meeting criteria for Asymptomatic Neurocognitive Impairment (ANI). After supplementation with the probiotic formulation, all HIV positive participants showed improvement of neurocognitive performance. No difference in fecal Phe/Tyr ratio was observed at baseline between HIV infected participants and healthy controls. At T6, HIV infected participants showed a significant reduction in the fecal concentration of Phe (p 0.004) and a concomitant increase of Tyr (p 0.015) with a consequent modification of the Phe/Tyr ratio (from 11.90 at T0 to 4.23 at T6; p 0.002). A decrease in Trp concentration at T6 was also observed (p 0.047).

**Conclusions.** This specific probiotic supplementation seems to exert a positive effect on neurocognitive impairment in infected subjects. The significant modification of Phe/Tyr ratio observed after probiotic supplementation opens a new avenue of research on phenylalanine hydroxylase and tetrahydrobiopterin in HIV subjects. The intestine's lining is damaged in HIV+ subjects and some local and hepatic enzymatic activities are disturbed, with consequent disruption of balanced absorption of nutrients leading to nervous system injury. If confirmed, the fecal Phe/Tyr ratio could represent a non-invasive parameter to establish and monitor a "neurotropic diet" for ANI patients.

# **MORPHOLOGICAL RESEARCH AND RELATIONSHIP BETWEEN BIOMARKERS AND OXIDATIVE STRESS IN BRAIN TRAUMA AND IN HYPOXIC-ISCHEMIC INJURIES**

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The head trauma and hypoxic-ischemic encephalic injuries are a major cause of death whose framework are taken into account the neurological characteristics and the changes identified with CT and MRI.

Our study research evidence about the correlation between genetic variants, extent of brain injury and clinical outcome after TBI. In the literature it was demonstrated the existence of a fairly precise chronology of expression of different markers of cerebral hypoxic-ischemic injury due to a stimulation of different cell types and to a different response from the ischemic insult cells. Oxidative stress plays a major role in the genesis of delayed adverse effects that contribute to permanent damage.

An important area of research is the identification of the period of hypoxic-ischemic injury to the assessment of the causal link and any responsibilities with the methodological rigor of their discipline, articulated by means of:

- an examination of the medical records and imaging studies;
- *pre-post-mortem* radiological study;
- autopsy complete with biological samples;
- complete histological investigation.

An autopsy is the Prince survey and its value is enhanced with the help of appropriate toxicological investigations, microbiological, genetic and histological. Particular attention should be paid to the research of cell changes after the hypoxic-ischemic and whose precise history is well known in the literature. Upon completion of the routine histopathological reading, using new immunohistochemical type searches for the detection of proteins or enzymes expressed at brain level in subsequent stages to a traumatic event / hypoxic-ischemic. In order to find reliable markers, objective and repeatable, which anchor the judgment on the age verification pathological insult, we will proceed to the review of a large series of autopsy surveys conducted at the Institutes of the Universities and Research Centers. The brain samples represented by cortical levies, basal ganglia and brainstem, will be sectioned and stained with hematoxylin-eosin accompanied by argentic, Perls and Von Kossa. For the next immunohistochemistry will be used an antibody panel based on the most recent scientific literature on the subject of damage brain, directed against: GFAP, TNF, IL1, IL-6, MAC387, HSP 27, 70 and 90, COX2, ORP150, b-APP, Tryph, GAP-43, apoptosis (TUNEL-TdT enzyme). The application of this methodology would allow to identify immunohistochemical markers for evaluating the timing of brain damage.

# **INTEGRATIVE INTERVENTION MODEL FOR THE STUDY OF THE PSYCHOPHYSIOLOGICAL PARAMETERS AND THE INDICATORS OF ORGANIZATIONAL WELLNESS IN A GREAT ITALIAN COMPANY WORKING IN THE PAPER SECTOR**

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The topic of organizational well-being, understood as the ability of an organization to develop and maintain the physical, psychological and social well-being of the people who work there, has recently been affirmed. The quality of working life is the result of many factors inherent to the workplace, especially in terms of exposure to psychosocial and physical risks.

**Aim.** The purpose of this project is to identify a cognitive tool to discover and measure, in a reliable and scientific way, critical, strong points, areas of weakness within the workplace through the study of psychophysiological parameters and indicators of organizational well-being.

**Methods.** During the health surveillance activities, a sample from a population of N=388 male paper mill workers was selected. A clinical medical history questionnaire was administered to all subjects and we evaluated their Blood Pressure (BP), their Body Mass Index (BMI) and other useful data for the purpose of evaluating possible confounding factors for subsequent analyzes such as extra-professional exposures and eating habits and habit of cigarette smoking. An AUDIT questionnaire was administered for the evaluation of the habit of consuming alcoholic beverages. The collected data will be inserted in a special software for the computerized management of health and risk files that will allow to extract the data useful for the research in question. The MOHQ - Multidimensional Organizational Health Questionnaire will be administered to a group of workers: it consists of 68 items rated on 8-point that allows to define the "state of health" of the organization and to identify the areas on which to intervene to promote better working and wellness conditions. Data analysis will be performed using SPSS statistical software.

**Expected results.** The research focuses on the implementation of a method of analysis on organizational well-being to indicate a model of promotion of the quality of working life that, starting from the study of the health status of workers and the work context, develops solutions and interventions for the entire organization.

## STUDY OF THE PREVALENCE OF ANISAKIS HYPERSENSITIVITY IN PROFESSIONALLY EXPOSED POPULATIONS

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*Anisakis* is a parasitic nematode which infects marine fish and can cause gastrointestinal disease if accidentally ingested. Infection can be accompanied by IgE mediated hypersensitivity reactions such as urticaria, angio-oedema and anaphylaxis. The workers involved in fish processing can develop allergy to *Anisakis* and a potential occupational risk was suggested: in fishermen and workers assigned to fish processing and sale, indeed, have been described occupational allergy to *Anisakis*, including asthma, rhinoconjunctivitis and protein contact dermatitis. EFSA recommends coordinated studies to improve surveillance and diagnostic awareness of allergic reactions to parasites in fishery products. The *in vivo* (skin-prick tests) and/or *in vitro* level of specific IgE, are usually used for diagnosis of sensitization to the parasite, and it is accepted that these tests are highly sensitive methods. *Anisakis* proteins demonstrate considerable immunological cross-reactivity to proteins of related nematodes and other invertebrates such as house-dust mites and cockroaches, probably responsible for false-positive results. Specific IgE to allergens from the parasite can be also detected by immunoblotting (WB) which is a method more specific. Furthermore, in the last years extensive data support the use of the Basophil Activation Test (BAT) in allergy diagnostic investigations, using flow cytometry analysis. The project is carried out in collaboration with the Regional Reference Center in Immunoallergology of the Buccheri La Ferla Hospital in Palermo (subject recruitment, Skin Prick Test (SPT) and specific dosage of IgE for *Anisakis*, tropomyosin, and BAT). Therefore, during the first year of research, at the IZS of Palermo, the method for extracting the raw *Anisakis* antigen and extracts from excretory-secretory allergens was developed, using the procedure reported in Moneo et al, 2007. The larvae were collected from infested fish samples, subjected to morphological and biomolecular species identification by PCR-RFLP. The allergenic fractions obtained, Anis 1 (20-22 kDa), Anis 4 (9-10 kDa) and the allergen component Anis 5, Anis 8 and Anis 9 (15-18 kDa), separated by WB electrophoresis, were aliquoted and stored at -80°C for the subsequent analyses.



## IS IT TIME TO RETHINK THE GUIDELINES FOR THE DIAGNOSIS OF LUNG CANCER?

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In USA, the eligibility to lung cancer screening through Medicare or private insurances, increased the number of non-diagnostic bronchoscopic examinations and, consequently, further invasive procedures in patients ultimately found with benign lesions. We estimated clinical benefits and costs of introducing a bronchial-airway gene-expression classifier (BGC) to improve the performance of bronchoscopy on suspected pulmonary lesions.

We developed a discrete-event simulation model to compare clinical and economic outcomes of three different diagnostic strategies: (i) standard, following the current guidelines; (ii) conjugate, integrating the BGC to the bronchoscopy indication on the current guidelines; (iii) proposed, with an extent use of bronchoscopy plus BGC also for diagnosis of peripheral lesions. A societal perspective and a two-year time horizon were adopted. Main data sources were two large cohort studies on BGC validation, published literature and Medicare claims. The primary outcome measures were costs in 2017 U.S.\$, quality-adjusted life-years (QALYs), and incremental cost-effectiveness ratios. One-way and probabilistic sensitivity analyses were used to explore the robustness of the results.

The two interventions that include the use of BGC (i.e., conjugate and proposed diagnostic strategies) were “dominant” strategies, clinically superior as well as cost saving compared with the standard diagnostic strategy. Nevertheless, the conjugate diagnostic strategy (ii) was also “dominated” by the proposed one (iii), which achieved higher quality-adjusted survival at lower costs. Using the BGC for lung-cancer diagnosis was associated with reduced utilization of invasive procedures at increased risk of complications (i.e., wedge resection, lobectomy or segmentectomy and TTNB). With standard diagnostic strategy, a total of 69.4% (95%CI, 57.2 to 82.6%) patients underwent these procedures. Adopting the conjugate strategy (ii) reduced their use to 61.4% (95%CI, 50.2 to 73.4%). With the proposed strategy (iii), the total estimate dropped to 39.9% (95%CI, 32.1 to 49.2%). Surgery-related deaths were 0.59% (95%CI, 0.04 to 1.82%) under the standard strategy, 0.54% (95%CI, 0.04 to 1.57%) under the conjugate strategy, and 0.43% (95%CI, 0.03 to 1.31%) under the proposed strategy.

The concurrent use of BGC and bronchoscopy is a new promising diagnostic approach for the early detection of lung cancer in at-risk individuals. It reduces the non-diagnostic results and saves avoidable morbidity and mortality and unnecessary costs due to further invasive examinations.

# **POLICY ANALYSIS FOR THE PROMOTION AND PROTECTION OF THE HEALTH - THE TRAINING OF HEALTH PROFESSIONALS AS A MANAGEMENT TOOL FOR EQUAL AND ACCESSIBLE SERVICES**

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Constitutional principles protect health as a right of the individual and as an interest of the community, and underline how some rights should not only be formally recognised, but also made concretely accessible to all and, in particular, to those who may not actually enjoy them, for their material conditions. Despite this, inequalities persist in the availability of this right throughout the country, generally to the detriment of the poorest in terms of material and relational resources and of migrants who can be twice vulnerable, often adding to precarious and risky living conditions, health, linguistic and cultural differences that can be a barrier to prevention and treatment. More generally, the immigration phenomenon, with its complexity, represents one of the most challenging changes that Italians have had to face during the last twenty-five years.

The present research project aims to contribute to the issue of health inequalities and the approaches adopted to face them. Starting from an analysis of the current national regulatory framework regarding access to health care and treatment, it arrives at a recognition of the strategies implemented at local level to achieve equity, with particular reference to the more fragile Italian and foreign population groups, and paying attention to the issue of the sustainability of measures within the national health fund.

Among the strategies adopted at local level in order to combat inequalities in access to services and promote healthy equity, of particular importance are the training activities of the operators involved in the reception and assistance of vulnerable populations. In fact, as highlighted in various official documents at international and national level, the training and updating of social and health workers, aimed at qualifying their intervention in addressing issues associated with equity, represent an important and strategic element for the promotion and the protection of the health of the most vulnerable populations. This is in line with the principles, objectives and characteristics of the health system, and contributes to spreading among the health professionals a cultural climate favourable to an organisational change.

As part of the research, therefore, a survey will be carried out of training activities related to the health of the most fragile and marginal population groups, made in recent years throughout the country. For the realisation of the survey, we will make use of the training offices at the ASL and Hospital level. A data set of keywords is currently being elaborated, to query the databases made available by the bodies that manage the ECM (and non) national training at national level.

# **EXPLORING SELF-CARE PROCESS IN WOMEN WITH BREAST CANCER. A GROUNDED RESEARCH APPROACH STUDY**

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Breast Cancer in women have different aspects related to the person. Many problems are linked with the ability of the individual to self-care, this is an important health care issue for nursing as well as public health. Self-care is what people do for themselves to establish and maintain health, prevent and deal with illness. It is a broad concept encompassing: hygiene (general and personal); nutrition (type and quality of food eaten); lifestyle (sporting activities, leisure etc.); environmental factors (living conditions, social habits, etc.); socioeconomic factors (income level, cultural beliefs, etc.); self-medication. The aim of the present qualitative study is to explore and understand the self-care process in women with a diagnosis of breast cancer in order to develop a model useful for better health care intervention. This study uses an exploratory qualitative design through Grounded theory methodology. Women with breast cancer diagnosis with or without mastectomy who have different experiences of self-care related to age, marital status, education, socio-economic status, employment status, duration and severity of disease participated in study. Sample size determined by data saturation. Interview consist of a single question related to the process of self-care. Data were analyzed manually at the first step and by MAXQDA software (Version 10) as second step to try to compare the extrapolation of concepts Process of collecting and analyzing data was concurrently performed. Analyzing data carried out following Corbin and Strauss process and Grounded Research methodology approach (2008). Being a qualitative study, different tools of analysis used in order to give meaning to the themes.

In order to achieve a comprehensive theory framework, the process will include two steps: phenomenological interview and *verbatim* transcription, for this step researcher had interviews and started to analyze from first one, after 15 interviews saturated data. Then, analysis of data for concepts extrapolation and labeling open coding. From data analysis emerged three main categories: mental confusion, change in the individual, disruption of social presence Bringing Process into the Analysis has focused independence, conscious care and search for treatment. The final stage of the analysis will be Integrating Categories to build the theory. The Integrating Categories process involves the process of connecting the Categories around a central Category and exploring the theoretical structure derived from it. The results of this study should hopefully be used to formulate standard of care and policy in our country for the benefit of breast cancer women and their families.

# THE INFLUENCE OF HSV1 INFECTION IN MODULATION OF AGE-RELATED EPIGENETIC MARKERS

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**Introduction.** Herpes Simplex Virus type 1 (HSV-1), a neurotropic virus capable to establish a latent infection in the host, can interact with host epigenetic complexes. It is known how the virus genome is chromatinized by the host epigenetic machinery and how the viral components try to counteract the transcriptional silencing. Growing evidence suggest that viral lifelong infections can promote the epigenetic imbalance of the host and could induce distress within the cellular lifespan, but several aspects have yet to be clarified. This topic appears intriguing particularly for HSV-1 that has been linked, by our and other groups, to Alzheimer's Disease, the main form of dementia in the elderly.

**Aim.** To study the interplay between HSV-1 and the host epigenetic balance, particularly in the Central Nervous System, we evaluated the levels of some aging hallmarks, such as post-translational modifications of histones (e.g., H3K56ac, H4K16ac), in *in vitro* and *in vivo* experimental models of acute and recurrent virus infection.

**Methods.** Primary cultures of neuronal cells were obtained by E17 rat embryo brains and plated at a density of  $10^6$  cells/well. After 7 days *in vitro*, neuronal cell cultures were infected with HSV-1 or MOCK and analysed by Western Blot (WB) at 24h (acute infection) and 8 days post-infection (p.i.) for detecting H3K56 and H4K16 acetylation levels. Entorhinal cortex homogenates from BALB/c mice were analysed in WB for analysing H3K56 and H4K16 acetylation levels. In particular, these mice were HSV-1 or MOCK inoculated at 2 months of age and then subjected to several hyperthermia cycles within their life to induce virus reactivations before sacrifice at 13 months of age. The virus presence in the brain was tested by PCR and RT-PCR analysis of viral TK gene and ICP4 mRNA and Immunofluorescence analysis of gB expression on brain slices.

**Results.** We found that HSV-1 can modulate the levels of H3K56 and H4K16 acetylation and during acute infection in primary culture of neuronal cells. Furthermore, the decrease in acetylation levels of H3K56 was found also 8 days p.i, suggesting that the virus can promote epigenetic aging. In addition, similar effects were found following recurrent infections in mice. Overall these data suggest that HSV-1 affects cellular epigenetic balance. Further studies are in progress to clarify the mechanism underlying virus-induced epigenetic alterations.

## VITAMIN D DEFICIENCY AND HEALTH-RELATED QUALITY OF LIFE IN CHRONIC EPATITIS C

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Vitamin D deficiency is an important health problem in the general population and in patients with Chronic Hepatitis C (CHC), in which the prevalence of vitamin D deficit ranges between 46% and 92%. Vitamin D has many non-skeletal benefits and plays a key role in modulating multiple brain functions. Several studies showed that vitamin D deficiency is associated to worsening of physical and mental functions, affecting negatively health related quality of life (HRQOL). The impact of vitamin D deficiency on quality of life in CHC patients has never been investigated.

The aim of this study was to evaluate the prevalence of vitamin D deficiency in CHC patients and analyze its correlation with HRQOL.

We enrolled 155 consecutive CHC patients. Demographic, clinical, laboratory and virological data were collected. Vitamin D deficiency was defined as a level lower than 20 ng/ml. Health measurement Short Form-36 (SF-36) was used to assess HRQOL. The form explores eight domains related to physical and mental health.

The prevalence of vitamin D deficiency was 34.2% (53/155). Vitamin D deficient patients showed significantly lower scores in Physical Functioning (PF) ( $p=0.029$ ), Role Physical (RP) ( $p=0.006$ ), General Health (GH) ( $p=0.002$ ), Vitality (VT) ( $p=0.025$ ), role emotional ( $p=0.008$ ), mental health ( $p=0.018$ ), Physical Component Summary (PCS) score ( $p=0.033$ ) and Mental Component Summary (MCS) score ( $p=0.042$ ) when compared to those with normal levels. Furthermore, they showed statistically higher prevalence of cirrhosis ( $p=0.009$ ), while they did not differ for age, gender, transaminases levels, HCVRNA viral load and e-GFR.

By multiple logistic regression analysis, vitamin D deficiency was independently associated with 3 out of 4 physical domains [PF ( $p=0.011$ ), RP ( $p=0.019$ ), GH ( $p=0.001$ )] and only 1 out of 4 mental domains [RE ( $p=0.021$ )]. The presence of cirrhosis was not correlated with HRQOL.

The study demonstrates for the first time that vitamin D deficiency is significantly and independently associated with reduced SF-36 physical scores leading to worsening HRQOL in CHC patients. This observation is of crucial relevancy because physical health is associated with work productivity in CHC patients. Given that serum vitamin D levels are easy to evaluate, and deficiency treatment is simple and inexpensive, clinicians should be aware of the potential multiple benefits of vitamin D supplementation in CHC patients.

## ROLE OF THE HUMAN GTP-ASE RAC1 IN PLASMODIUM FALCIPARUM INFECTION

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Malaria is the deadliest parasitosis worldwide, causing 216 million cases and 445.000 casualties in 2016. Among the malaria causative agents, *Plasmodium falciparum* is the main cause of death in humans. The identification of new antimalarial drug targets is a fundamental challenge, given the continuous emergence of drug-resistant strains of *P. falciparum* in endemic areas.

The human GTPase Rac1 is known to be involved in infection of several intracellular pathogens, including bacteria (e.g.: *Salmonella enterica*, *Shigella flexneri*, *Staphylococcus aureus*) and parasites (e.g.: *Toxoplasma gondii*, which belongs to the same phylum as *Plasmodium falciparum*). Rac1 was also identified in a proteomic analysis of erythrocyte membrane microdomains, subcellular organelles shown to be essential for *P. falciparum* invasion of the host cell.

In order to investigate whether Rac1 plays a role in *P. falciparum* infection, we tested 16 Rac1 chemical inhibitors both commercial and newly designed on asynchronous parasite cultures, and showed that 13 compounds have anti-malarial activity. Four inhibitors showed IC<sub>50</sub> below 1  $\mu$ M. In particular we wanted to assess the role of Rac1 in *P. falciparum* invasion of host erythrocytes. To do this, we performed invasion assays and measured invasion rates by FACS analysis. Three different Rac1 inhibitors were able to reduce *P. falciparum* invasion efficiency, in a dose-dependent way.

We also investigated Rac1 subcellular localization during *P. falciparum* invasion by immuno-fluorescence assay and showed that the GTPase is recruited to the site of parasite entrance, colocalizing with the moving junction, and is then gradually depleted from the erythrocyte membrane, being relocated to the parasitophorous vacuole membrane (PVM). Furthermore, the GTPase is activated by the parasite both during invasion and parasite intracellular growth.

These results indicate that malaria parasites exploit the host cell transduction machinery, activating Rac1 in order to invade human RBCs. Future experiments will include co-immunoprecipitation of Rac1 and its partners in order to establish which interactions the GTPase establishes during the invasion process and erythrocyte transfection of a Rac1 dominant-negative protein in order to confirm the functional analysis with a different approach.

# **THE ROLE OF CARDIOMICRORNAS IN TIMING OF EARLY MYOCARDIAL INFARCTION: MEDICO-LEGAL EVALUATION AND TRANSLATIONAL MEDICINE IMPLICATION**

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Myocardial Infarction (MI) is a major cause of mortality and disability in the world and represents an outcome measure in quality programs in health systems. In the clinical practice, the diagnosis of early stages of myocardial ischemia, within 6-8 hours ischemic insult, in which they are not yet clear histomorphological signs, it remains an unsolved problem. The goal of this research is to detect and quantify the expression of miR1, miR-133a, miR-499 and miR-208a on cardiac tissue samples from subjects who died of MI, in the first 6 hours of the onset of clinical symptoms, attributable to myocardial ischemia. The casistic has been selected from autoptic cases of the Section of Pathology Forensic University of Foggia, and they have been chosen 6 cases with a well-defined clinical course (clinical symptoms, ECG and laboratory data), and in which *post-mortem* examination confirmed the diagnosis of MI. The patients had a survival time ranging from 0-6 hours. For each case, we will study the cardiac tissue samples (7 standard samples), collected in the course of autopsy and preserved in formalin, on which will be made the dosages of the following miRNAs: miR-133a, miR-208a, miR-499a, miR-1. At the same time, as a control test, in each case selected it has been measured the dosage of ubiquitously expressed in the cardiac tissue, miR186 and miR361, independent of pathological condition, age, gender. Therefore, the expression of the dosed miRNAs was compared with the expression of the control miRNAs. The results obtained indicate a significant greater expression of the miRNAs dosed with respect to the control miRNAs, as the following average: miR-133a is expressed 1,7 more than miR186 and 4,2 than miR361; miR-208a is expressed 7,1 more than miR186 and 16,9 than miR361; miR-499a is expressed 1,5 more than miR186 and 3,7 than miR361; miR-1 is expressed 3,1 more than miR186 and 7,4 than miR361. The next step of the study it will be evaluate the expression of the miR-133a, miR-208a, miR499a, miR-1, in the patients died for MI after 6 hours, to ascertain significant difference of the expression, respect the timing.

## **PROBIOTICS MODULATE TOLL LIKE RECEPTORS, TYPE I/III INTERFERON AND RETROVIRAL RESTRICTION FACTORS IN HIV-1 INFECTED PATIENTS**

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A gastrointestinal dysfunction associated with altered microbiome composition and a severe enteropathy characterize the chronic HIV-1 infection, driving persistent immune activation. Recent findings support the ability of probiotics to reverse the gut damage in HIV-1 subjects. In this regard, it is known that recognition of PAMPs by pathogen-recognition receptors in the gut, such as the family of TLRs, in particular TLR4 and TLR9, triggers intracellular signaling cascades culminating in the activation of the type I and III IFN response. Given that type I IFN has detrimental effects during HIV-1 infection and that IFN $\lambda$  seems to play a significant antiviral activity in the gut site, the expression of TLR4/9, IFN $\alpha/\lambda$  subtypes, and of some IFN induced restriction factors was evaluated both in gut and PBMC of ART treated HIV-1 patients. Furthermore, the probiotics effects on IFN-mediated immunity were also analyzed. Ten HIV-infected subjects with stable suppression of viral load underwent endoscopic procedures and blood collection prior to initiation of probiotics supplementation (T0) and after 6 months (T6). Normal mucosa biopsies were obtained and lamina propria lymphocytes were isolated. TLRs, IFN $\alpha$  (n=12) and IFN $\lambda$  (n=3) subtypes, SAMHD1, Mx2, APOBEC3G and IFI16 were measured by RT/ real-time PCR. The expression of TLR4/9, IFN $\alpha$ , and IFN $\lambda$  subtypes were significantly higher in the gut compared to those measured in PBMC at T0. By contrast, Mx2, SAMHD1 and APOBEC3G resulted significantly higher in PBMC both at T0 and T6. The expression profile of IFN and/or IFN-related pathways changed after probiotic supplementation. In particular, IFN $\alpha$  subtypes (6, 10,14,17 and 21) and IFN  $\lambda$ 2 levels increased significantly, while SAMHD1 e APOBEC3G decreased in the gut after probiotic supplementation. A similar trend was observed for TLR4 and TLR9. About the other IFN species/subtypes and retroviral restriction factors analyzed, we found a differential modulation both in the gut and in PBMC at T6. These findings highlight that TLR, IFN $\alpha$  and IFN $\lambda$  subtypes and restriction factors are differentially expressed in the GALT and PBMC of HIV-1-infected patients. Moreover, the probiotics supplementation seems to have beneficial effects on the innate antiviral response, by regulating the expression of some IFN subtypes, IFN-related pathways and the gut microbiome composition.



# **SOCIALLY DANGEROUS PSYCHOPATHIC PATIENTS NGRI: A CASE CONTROL STUDY TO EVALUATE RISK FACTORS FOR RECIDIVISM**

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Since 2008 people considered Non-Guilty in Reason of Insanity (NGRI) and socially dangerous, are sectioned in the residential forensic units called REMS (Residences for Execution of Security Measures), exclusively managed by health operators, without policemen support. In judiciary laws, social danger is considered as the risk for a person to commit future crimes in reason of mental disorder. For this reason, the assessment of mental and behavioral parameters is fundamental to connect clinical facets with recidivism and to predict the risk of violence.

Violent behavior can occur in Psychosis and Mood Disorder, often in acute phases, whereas is very common in about 80% of people Personality Disorder, above all Borderline and Antisocial too. Literature suggest that Psychopathy represent the trans-dimensional clinical condition that correlates with longer criminal careers and high level of violent behavior. In fact, psychopathic suffer from a profound affective deficit, including shallow emotion and inability to experience empathy, guilt or remorse.

We developed a protocol to assess both psychological and biological aspects in patients admitted in REMS of Mental Health Department of ASL Rm5 in order to evaluate neurocognitive/psychiatric pathways and to compare differences between psychopathic and non-psychopathic groups. Psychopathy assessment require PCL-r, that is the gold standard reference scale. Case and Control are adults male 20 admitted in REMS since 2016, classified as psychopathic if their PCL-r scores is  $\geq 20$ . All participants underwent clinical evaluation and MRI (Magnetic Resonance Imaging) study with specific sequences to examine possible dysfunction in neural connectivity.

Preliminary results demonstrate that psychopathic participants (5 adults, mean age: 41,2 yo, PCL-r: 23,6) had many lifetime's criminal records, while non-psychopathic (4 adults, mean age 44,3 yo, PCL-r: 10,3) are admitted in forensic units for the first time in their life. Moreover, psychopathic traits may be correlated with different patterns of atypical neural connective activity. These data are concordant with previous literature and suggest that correlation between psychopathic and non-psychopathic NGRI could produce other pattern to predict recidivism's risk in clinical terms, with important implications in forensic psychiatry and judiciary contests.

## HUMAN ENHANCEMENT: ON THE EDGE BETWEEN POSITIVE LAW AND NATURAL LAW

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Human Enhancement consists in a modification aimed at improving the performance through interventions in the human body. The dizzying development of scientific research putted men in the position to direct military enhancement experiments and in this background, fragile balances about the unborn child and the right of the health's safeguard arise in contrast to eugenics selection procedures.

In addition, the ambition of a physical perfection brings the society and the single person to intellectual/neurocognitive's (smart drugs, Deep Brain Stimulation) and sport performance's enhancement (doping). In such a context, a definition of the so-called human enhancement arises. The starting point of the seven types of enhancement's analysis considered and studied until now (prenatal genetic enhancement, cosmetic surgery, military enhancement, doping, Deep Brain Stimulation, smart drugs and biological enhancement) appears unitary: the discoveries and the ongoing researches improve (or try to improve) the way the human body normally works. Some of the techniques or the methods that are part of this dissertation are already regulated. It's the case of doping, cosmetic surgery and prenatal genetic enhancement's prohibition. Some others, as smart drugs and Deep Brain Stimulation, are involved in our analysis in so far as they get used beyond the treatment of the disease they are addressed to.

Others, as the military and biological enhancements, still are in an experimental phase. The aim of the research activity is the examination of the ethical and social issues and the law in force's analysis of each one of the areas of interest, starting from the international and national legislations, from the Science and Technology Options Assessment's Human Enhancement Study to the Comitato Nazionale per la Bioetica's opinions, with the aim to incentivize a uniform normative framework's development. And verify the necessity of an actualized law, inspired on the requirement that "*the interests and welfare of the human being shall prevail over the sole interest of society or science*". A "case by case" theory approach, ductile and able to adapt on the peculiar characteristics of every single form of enhancement, with the possibility to adopt different solutions depending on the peculiarity, will be verified as compared to a simplified perspective of standardized and universal procedures (guidelines/protocols) of the subject's regulation.

A systematic research, read and interpreted in a selectively juridical viewpoint and of a regulation proposal, allows to gather and order the knowledge's complex in a key-perspective of possible applicability solutions.

## **PILOT PROJECT TO SET UP A CENTRE FOR PREVENTIVE MEDICINE AND HEALTH CARE FOR STUDENTS OF MEDICINE AND HEALTH PROFESSIONS OF THE UNIVERSITY OF ROME**

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Sapienza University of Rome is the largest University in Europe, welcoming students from all over Italy and Europe. The focus of this project is on 3504 students of the Faculty in Medicine, considered the most exposed in their technical and practical activities. About 60% of these students left their families' home and city. Not rarely they deal with many difficulties especially due to the independent management of their own health (hence the loss of contact with their family physician). Often these subjects begin with unhealthy lifestyle habits that act as a source of stress negatively influencing their academic achievement on health and quality of life. The project provides the establishment of a pilot center of preventive medicine and health care that can contribute to protecting health and the quality of life of students, through the establishment of:

- a) a department of Preventive Medicine with expertise in vaccinations for health workers and lifestyles;
- b) a General Medicine Service;
- c) the creation of a website dedicated to these issues.

Data about lifestyles were collected using a self-administered questionnaire, including a validated Food Frequency Questionnaire, (FFQ), which included 12 items corresponding to the 12 main dietary groups: carbohydrates, vegetables, fruit, extra virgin olive oil, white meat, red meat, fish, eggs, cheeses, ham and salami, legumes and sweets. The adherence to the Mediterranean Diet (MD) was appraised according to a scale of 0-12. The results of a preliminary investigation, comprising 122 participants, showed that non-resident students had more difficulties to contact their Family Physician. Therefore, these students are more interested in the use of the service including the website that is active since July 2017. With the beginning of the University, students often engage in unhealthy lifestyles, especially worsening in eating habits. The average MD score was 7 (23,0%). While a 38,5% reached a score under  $\leq 6$ , indicating that they did not adhere to MD; 38,5% exceeded a score of 8, adhering to it in varying degrees. Only 3,3% reached the maximum score of 11. Around 57% noticed a change in eating habits as well as changes in the body weight (23%) since they started University. Those changes are quite linked to the beginning of University courses for 12,3% and absolutely linked for 3,3%.

## CONTRIBUTION OF ASTHMA IN OPIATE DEATHS

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Some studies have shown a connection between asthma deaths and opiate abuse, but the process in which opiates exacerbate asthma is still unclear. Opiates may impair judgment during an acute asthma attack, leading to inadequate treatment. Alterations in mental status may increase aspiration risk. Some studies have also demonstrated an opiate-induced bronchoconstriction.

In the present study, data on opiate deaths in the Department of Forensic Sciences of Sapienza University of Rome and in Cook County Medical Examiner's Office in Chicago (USA) have been collected. A comparison was performed between the opiate users who had a history of asthma and the opiate users who did not, regarding demographic, anamnestic, seasonal, autopsy, histological and toxicological findings. A histological grading of asthma changes was also performed.

A history of asthma was found in 78 out of 855 cases of opiate deaths (9.12%). The majority of people who died due to opiate intoxication and had a history of asthma were males and African-American. Among asthma cases, the levels of morphine in blood ranged between 23-1,740 ng/ml (Mean: 209.51 ng/ml), the levels of blood 6-MAM ranged between 12-280 ng/ml (Mean: 80.6 ng/ml) and the levels of blood codeine ranged between 24-34 ng/ml (Mean: 26.6 ng/ml). Regarding the grading of asthma, we found 32 cases with severe asthma, 19 with moderate asthma and 27 with mild asthma. We randomly selected 80 opiate deaths without a history of asthma. The levels of morphine in blood ranged between 1,115-5,280 ng/ml (Mean: 3,450.89 ng/ml), the levels of blood 6-MAM ranged between 70-460 ng/ml (Mean: 321.1 ng/ml) and the levels of blood codeine ranged between 23-52 ng/ml (Mean: 45.7 ng/ml).

Preliminary statistical analyses revealed that the levels of blood morphine were significantly higher in non asthma cases compared with asthma cases. These findings may support the hypothesis that the quantity of morphine needed to cause death in asthmatic can be lower than the quantity of morphine needed to cause death in non asthmatic: anatomic and physiologic changes of asthma can play a role in deaths due to opiate, maybe determining a higher susceptibility to the effects of these substances (bronchoconstriction, respiratory depression, etc).

# EVALUATION OF ANTIMICROBIAL ACTIVITY OF THE ESSENTIAL OIL FROM *SATUREJA MONTANA*, L. LAMIACEAE

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**Introduction.** Many Essential Oils (EOs) show a strong antibacterial capacity and have been screened as potential sources of novel antimicrobial compounds. A crucial feature of EOs is their hydrophobicity, which act damaging bacterial cell membrane, interfering with its permeability. EOs of the genus *Satureja* are known to have antimicrobial and fungicidal properties. The first step of my study aims to determine the chemical composition of commercial essential oil of *S. montana* (SGG), evaluate its antimicrobial properties towards different bacterial strains and its ability to prevent bacterial biofilm formation, to verify its activity also in addition to antibiotics.

**Materials and Methods.** Compositional analysis of the commercial SGG EO (Talia; Roma), was evaluated by Gas Chromatography and Mass Spectrometry (GC-MS). Strains selected were: *Staphylococcus aureus* ATCC 25923, *S. aureus* ATCC 6538P, *S. aureus* PGSA (clinical isolate), *Listeria monocytogenes* LM9 (clinical isolate), *Escherichia coli* ATCC 25922.

Bacterial identification and antibiotic susceptibility tests were performed by automated VITEK-2 System. Minimum Inhibitory Concentration (MIC) of SGG EO was estimated by the broth micro dilution method. The combined antimicrobial activity of SGG EO and antibiotics was evaluated as the Fractional Inhibitory Concentration Index (FICI). Biofilm formation was performed in microtiter plate by crystal violet staining technique. Bacterial morphological changes were revealed by scanning electron microscopy.

**Results.** Results obtained showed that in *Satureja montana* essential oil, the prevalent components were carvacrol (51%) cymene (13%), tymol (11%) and terpinene (5.5%). The results obtained showed a noteworthy antibacterial activity of SGG EO with a range of MIC between 0.39 mg/ml and 1.56 mg/ml towards all tested bacterial strains. Regarding effect on biofilm formation, dose-dependent reduction was observable for all tested strains. FICI value showed a synergic effect for gentamicin for reference strains at the lower tested concentrations (FIC Index values  $\leq 0.5$  at SGG 1/4, 1/8, 1/16 MIC values). Electron microscopy clearly demonstrated the bacterial membrane damage induced by SGG EO.

**Conclusions.** Essential oils could represent a useful support to control microbial growth and in prospect, circumvent the antimicrobial resistance.

**Next Measurement.** Next studies will use other essential oils and multi-drug-resistant bacterial strains even with the use of nanoemulsions made with these essential oils.

**New research topics**



## VITAMIN D, SMOKING AND COLORECTAL POLYPS

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**Aims.** Vitamin D is mainly endogenously produced from the action of sunlight on the skin, (but sun exposure varies among populations) and slightly derived from the diet. Primary role of Vitamin D involves maintaining bone metabolism and calcium homeostasis. It also seems to play an important role in cancer control by reducing angiogenesis and modulating cellular growth and apoptosis. The protective role played by vitamin D on different epithelial tumors (breast, colon, prostate) has been widely reported. Furthermore it has been demonstrated that populations with substantial deficiency of vitamin D are at higher risk of neoplastic diseases. Smoking is a recognized risk factor for coloncancer, but very little is known about the effect of smoking on Vitamin D and about any interaction between them. Moreover, more information are needed on Vitamin D and smoking in pre-cancer lesions. This study aims to evaluate the role of smoking and Vitamin D levels in patients with colorectal polyps and without.

**Eventual results.** Vitamin D metabolism has been established to be modulated by some dietary factors such as intake of retinol, calcium and alcohol, but the potential interactions with smoking has not been well studied. This study aims to investigate this aspect and an expected result is to find an inverse association between smoking and vitamin D level; heavy smoking and low level of Vitamin D are expected to increase colorectal cancer risk similarly to what found by the HUNT study in the respiratory context. Vitamin D level, smoking and lung function in adults showed that associations among never-smokers were null whereas significant associations were observed in ever-smokers. A quantitative research approach will be adopted. Dietary and lifestyle data will be obtained through the use of questionnaires. Statistical tests and tools to measure the variation in outcomes will be used.

**Conclusions and prospective.** This study about smoking and vitamin D levels in patients with pre-cancer lesions can help in evaluating the role of each of them and their interaction. If expected results are confirmed, quit smoking and optimal level of vitamin D should highly recommended in order to avoid increased risk of colorectal cancer.

Additionally, other factors, such as skin exposure to the sun, could be explored and investigated among different populations to determine whether population-specific characteristics may influence study results



# EXTRACELLULAR VOLUME FRACTION IMAGING WITH CONTRAST-ENHANCED MAGNETIC RESONANCE IMAGING PROVIDES INSIGHTS INTO ACUTE, CHRONIC AND SUB-CLINICAL PATHOLOGY INFLAMMATION

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**Background.** Inflammation in response to infection and injury is a critical survival mechanism used by all higher vertebrates. Chronic inflammatory conditions are associated with the prolonged release of inflammatory mediators and the activation of harmful signal-transduction pathways, all of which contribute disease development and phenotypes. Quantitative Magnetic Resonance Imaging (MRI) of Extracellular Volume Fraction (ECV) may be able to detect subtle abnormalities such as diffuse inflammation acute or chronic due to infection and/or fibrosis. Using T1 values before and after administration of an Extracellular Contrast Agent (ECA) allows the additional calculation of the ECV, well-established in MRI. The validity of this technique was preliminarily evaluated in a study with 30 patients suspected to have diffuse inflammation in the heart muscle (myocarditis).

**Objectives.** The project aims are 1) to measure ECV in different tissues of patient with acute and or chronic infections before and after therapy, 2) to determine whether ECV varies with pathologies (and/or tissues), and 3) to detect subclinical abnormalities in normal appearing tissue far from the infection region.

**Preliminary results.** Pre-contrast T1 relaxation times were significantly longer in patients with myocarditis compared with control group (1175.2±48.3 ms vs 1079.2±43.8 ms,  $p<0.01$ ). ECV was significantly higher in patients with myocarditis compared with controls (36±4.1% vs 28.5±3.5%,  $p<0.01$ ). Preliminary analysis indicates quantitative MRI parameters (T1:  $R=0.76$ ,  $p=0.01$ ; ECV:  $R=0.81$ ,  $p=0.01$ ) with strong correlations with inflammation of the heart muscle, especially with ECV. Stratification of severe tissue structure was well discriminated by ECV quantification. The ECA remains strictly extracellular and does not enter parenchymal or non-parenchymal cells. Therefore, ECV strictly mirrors the volume of the deposited extracellular matrix.

**Conclusions and perspectives.** We hypothesized that quantitative assessment of tissue ECV would be clinically useful for detecting both focal and diffuse tissue abnormalities in a variety of acute and chronic infectious conditions. ECV imaging can quantitatively characterize tissue inflammation, atypical diffuse fibrosis, and subtle tissue abnormalities not clinically apparent on different method images. Therefore, ECV not only can detect tissue inflammation and/or fibrosis but also might quantify response to treatment during follow-up.

# SALIVARY ANTIGENS AS BIOMARKERS OF HUMAN EXPOSURE TO *Aedes* MOSQUITO BITES

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**State of art.** Mosquito species of the *Aedes* genus are vectors of arboviruses of large relevance for human health such as dengue, yellow fever, Chikungunya and Zika. The worldwide expansion of the invasive mosquito, *Aedes albopictus* represents a threat for public health as shown by recent outbreaks of Chikungunya/dengue in Italy/Southern classical entomological methods. However, these methods show several limitations and new tools to evaluate human exposure to *Aedes mosquitoes* and assess efficacy of vector control interventions would be very valuable. In this respect the measurement of human Antibody (Ab) response against mosquito salivary proteins is emerging as an interesting alternative method and a proof-of-principle has been provided for malaria vectors. The objective of my PhD project is to develop immunological assays based on *Aedes*-specific salivary antigens to evaluate human exposure to *Aedes mosquitoes*, especially *Aedes albopictus*.

**Methods.** Antigens (peptide and/or recombinant proteins) selected from a previously identified group of culicine-specific *Ae. albopictus* salivary proteins will be employed. Candidates will be evaluated by ELISA utilizing a mice model and validated by using a proper set of human sera. Groups of mice will be exposed to bites of different mosquitoes (*Ae. albopictus*, *Ae. aegypti*, *An. gambiae*) and sera collected at different time points (before, during and after exposure) will be used to evaluate the IgG response to specific antigens (in progress). Promising candidates will be validated using human sera collected from areas with different *Ae. albopictus* density, during the low (March-April) and high (September-October) density seasons.

**Expected results.**

- Identification of immunogenic *Ae. albopictus* salivary proteins/peptides.
- Evaluation of *Aedes*-specificity, cross-reactivity and kinetics of the IgG response.
- Estimation of spatial and temporal variation of the human IgG response to selected *Ae. albopictus* candidate markers.
- Development of ELISA assays to evaluate human exposure to *Aedes mosquitoes*.

# **TOXICOLOGICAL EVIDENCES ON CAFFEINE CONSUME OBTAINED FROM PROFESSIONAL ATHLETES, AMATEUR ATHLETES AND CADAVER: EPIDEMIOLOGICAL, BIOCHEMICAL, PATHOLOGICAL, TOXICOLOGICAL ASPECTS AND MECHANISMS OF BODY DAMAGE**

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Caffeine consumption is increasing in general population; its use is sustained from the well-known positive effects on concentrations and physical efforts. Abuse and dependence from caffeine are a frequent phenomenon, especially in some categories of individuals such as professional and non-professional athletes in which the risk for toxicological effects must be taken into account. Usually, blood caffeine concentration ranged between 80 and 100 mg/L are considered lethal for human, even if a direct correlation between blood levels and clinical effects is extremely difficult due to inter-individual differences.

Our project aims to determine differences, if any, in caffeine levels encountered in blood samples obtained from professional athletes, non-professional athletes and cadavers (representative of the general population). The choice of analyze caffeine level among athletes is due to the great use of caffeine in this category. Our analysis will also permit to compare lifestyle habits, use of illegal substances, cardiovascular, renal, hepatic and hormonal functions in people practicing professional and non-professional sportive activities.

Athletes have been enrolled on a voluntary basis and an inclusion criteria of our study is that athlete must be out of completion so that caffeine consume and eventually use of other substances will be representative of a normal and habitual consumption. Moreover, athletes' enrollment involved different gymnasium and sportive center in the center of Italy. In the same way, cadavers (maximum age of 50 years-old) came from morgues of the center of Italy.

As caffeine is not considered a performance-enhancing substance (doping agent) in the sportive community, we suppose that caffeine levels in professional and non-professional athletes will be higher than in general population. Furthermore, given the well-known co-assumption of caffeine with other psychoactive substances, we suppose that other substances than caffeine, such as steroids and cocaine, will be present in athlete's samples. Final results of our study may give useful data to better understand the entity of caffeine abuse among athletes and to support clinicians to prevent serious health consequences related to caffeine consumption.

## **INNOVATIVE METHODS FOR THE MONITORING AND ASSESSMENT OF AQUATIC ECOSYSTEMS**

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The current European and national approach for the monitoring and assessment of surface waterbodies is based mainly on the evaluation of chemical and ecological status. In relation to the chemical pollution it is well known that the current approach based only on the analysis of a list of chemical compounds is not fully representative of the real effects caused by the thousands of chemicals discharged in the environment included the mixtures and the emerging contaminants (e.g. pharmaceuticals, personal care products). In this research new ecotoxicological and biological monitoring methods and tools are applied in order to evaluate the quality of the aquatic ecosystems and protect human health and the environment. In particular, the so called “effect-based” tools will include the metagenomics, bioassays *in vivo* (e.g. zebrafish embryos, algae tests) and *in vitro* (e.g. Ames test) and they will be tested in two aquatic ecosystems in central and northern Italy. In particular, the use of Metagenomics will be useful to determine the microbiome present in the aquatic environment and also to identify rapidly pathogens and bacterial indicators relevant for the human health aspects, the other methods will allow to detect relevant modes of actions of groups of compounds (e.g. embryotoxicity). The new tools will allow to define a better representation of the overall chemical and microbiological quality of the lakes and rivers and the final results will be disseminated to the national and European policy makers with the aim also to update the current legislative framework.

## CLAIMS MANAGEMENT: A METHOD TO IMPROVE THE QUALITY IN HEALTHCARE

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**Objectives.** The goal of this study is to propose a standardized methodological approach to claims management that represents an added value in terms of implementation of quality in healthcare and patient safety as well as development of appropriate loss prevention strategies and cost rationalization.

**Materials and methods.** The study was conducted through the analysis of data on the litigation management carried out at the Policlinico Umberto I of Rome, from July 2015 to July 2017. Data were collected at the Hospital's Legal Affairs Office. All claims reported during the period under study have been included in the database and classified according to date on which the event took place, date of the complaint and amount requested. Subsequently, the data have been organized according to the International Classification for Patient Safety (ICPS) system as regards the type and the degree of harm. Finally, a medico-legal assessment of the loss risk and a technical evaluation of the value of each claim have been carried out.

**Results.** During the study period, 237 cases have been analyzed. This study, based on the type of event and technical estimates, made it possible to establish the prevalence of economic exposure for claims related to therapeutic errors (54%) and Healthcare Associated Infections (29%). Stratification according to loss risk also allowed establishing that, with an optimal medico-legal management, can be rejected most of the claims, with a reduction of costs for compensation.

**Conclusions.** The results obtained suggest the effectiveness of the proposed methodological approach in the proper management of litigation, through a standardized procedure based on the ICPS classification system. Furthermore, the methodology described has proved to be essential in the development of strategies aimed at rationalizing economic resources and corporate policies in the field of insurance coverage, accordingly to the provisions of Article 10 of Law 24/2017. The systematic management of claims allows greater control of risk, particularly when it concerns the so-called frequency claims, with notable repercussions in terms of cost containment, reduction of disputes, control of settlements, reduction of management time, possibility of preparing effective strategies of Loss Prevention and implementation of healthcare quality.

# **PATIENT INVOLVEMENT IN CLINICAL RESEARCH: THE ROLE OF CYSTIC FIBROSIS (CF) PATIENT ORGANIZATIONS ACROSS EUROPE**

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**Objectives.** Patient and public involvement in clinical research makes research more accountable and transparent, provides new insights that could lead to innovative discoveries, and generates research that is more relevant to patients, is participant friendly and ethically sound. The objective of this thesis project is to provide a review of practices, processes, and methods for patient engagement that have been used among European CF patient organizations. Research for this thesis project will be based on a survey conducted among 39 international not-for-profit patient organizations member of CF Europe: the federation of national CF organizations in Europe. Additional information will be obtained from the websites of these organizations, healthcare centers, and government bodies involved in patient centered medicine.

**Expected results.** The collected data could be used to promote an active involvement of CF patients in the whole process of clinical research.

**Conclusions and perspectives.** Specific measures would be proposed to improve CF patient involvement in 1) setting priorities, 2) study leadership and design, 3) improved access to clinical trials, 4) preparation and oversight of the information provided to participants, 5) post-study evaluation of the patient experience, and 6) the dissemination and application of results.

## **DIRECT ACTING ANTIVIRALS AGAINST HCV: EFFECTS ON METABOLISM AND LIVER DISEASE IN PATIENTS WHO ERADICATE HCV INFECTION**

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**Aims.** Despite the extraordinary efficacy of Direct Acting Antivirals (DAA) against HCV, the final outcome of patients with advanced liver diseases depends on how Sustained Virological Response (SVR) can improve the already established organic damages. This project is aimed to test the following 3 hypotheses.

A. Whether DAA may improve liver diseases in subjects with cirrhosis. Several studies suggest that SVR can dramatically improve liver function even in patients with end stage liver disease, while others indicate that decompensation and Hepatocellular Carcinoma (HCC) are still frequent after SVR.

B. Whether DAA may revert liver fibrosis. It is still not clear if fibrosis and cirrhosis can be reverted. Some studies suggest that advanced fibrosis may be reverted, while others support the hypothesis that advanced fibrosis is an irreversible process. Moreover, most of the studies supporting the hypothesis that SVR can revert fibrosis are based on cohorts of patients who received interferon, which has an intrinsic antifibrogenic effect. C. Whether DAA may improve metabolic alterations. HCV infection is associated with metabolic alterations, including glucose disorders, lipid metabolism disturbances and increased atherogenesis. These metabolic abnormalities are associated with poor outcomes. At present, studies to assess the effect of SVR on normalization of metabolic parameters have produced contrasting evidence.

**Preliminary results.** Since the start of the project we have concluded a pilot study to assess modification on glucose control in a set of 201 patients who achieve SVR with 806 glycemia determinations. Repeated measures of glycemia were analyzed through multilevel analysis framework to assess kinetics of blood glucose level at different time after therapy and for different levels of HCV viremia. Our models provided strong evidence that blood glucose levels significantly dropped, in patients with diabetes who achieve SVR. Most of the observed variation occurred at 3-5 week of therapy (-15.82 mg/dL;  $p < 0.001$ ) and in coincidence with HCV clearance (-21.10 mg/dL;  $p < 0.001$ ). A weak, though significant, reduction was observed in normoglycemic patients.

**Conclusion and perspectives.** Preliminary results confirm that projects hypothesis are solid and relevant for a clinical point of view. On 16<sup>th</sup> April 2018 the INMI Lazzaro Spallanzani Ethical Board have formally approved the protocols for three prospective cohort study which will be used to respond to the three aim of the study. Prospective enrollment starts by the end of July 2018. The results of the first pilot study are currently undergoing peer reviewing process for publication.

## **DISMEMBERMENT: A FORENSIC PATHOLOGIST APPROACH**

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**Background.** The term “dismemberment” is used to indicate the detachment of the limbs and/or the head from the trunk at the level of the respective joints, or else the subdivision of the thorax, the abdomen or the limbs into the respective segments that compose them. In cases of dismemberment, for forensic pathological purposes, it's of primary interest, in addition to identifying the cause of death, to investigate whether the dismemberment took place *ante-mortem* or *post-mortem*, also excluding possible intoxication by exogenous substances. The diagnosis must be mainly based on the characters of vitality of wounds.

**Objectives.** In this study we propose, starting from the analysis of the scientific literature, a protocol practicable in case of discovery of a dismembered body, based on laboratory methods such as toxicological, epigenetic, radiological, histological and immunohistochemical examinations.

**Materials and methods.** We analyzed 3 cases of dismemberment occurred in the last 5 years, in which the identity of the victim was ascertained during police investigations. In two cases we have found exclusively the dismemberment of the lower limbs, in the third we have seen the dismemberment of both, the lower limbs and the upper too, and an evisceration of endothoracic and endoabdominal organs. In all clinical cases, a preliminary full-body CTscan was carried out after an autopsy examination; in addition to the histological examination of the biopsies of lesional tissue with Haematoxylin/Eosin, immunohistochemical studies were performed with IL15, CD15 and Triptase in order to evaluate the vitality of injuries. Finally, toxicological tests were performed on biological fluids (central/peripheral blood, urine, vitreous humor) through gaschromatography aimed at identifying exogenous substances.

**Conclusions.** From our research it was possible to first identify the cause of death: in two cases it has been identified in a violent mechanical asphyxiation perpetrated by strangulation, while in the other it was attributed to a sharp-force injury penetrating in the abdomen. Histological and immunohistochemical results have shown that the dismemberment has occurred *post-mortem* in all three cases; toxicological investigations gave a positive result for exogenous substances (heroin) in one case, but not in such concentration as to determine death. In conclusion, we believe, in the case of dismembered body in order to arrive at a correct diagnosis, namely to understand the cause of death and the vitality of injuries/wounds, it's important to use the protocol shown above.



## WHAT ABOUT MIGRANT HEALTH? SOME STUDIES AND RESEARCH AIMED AT UNDERSTANDING HEALTH INEQUALITIES

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**Background and aim.** Migrants are a potentially vulnerable group, and their health condition is influenced not only by the presence/absence of disease, but by some other determinants. The complexity and precariousness that characterize their migratory path, the linguistic and cultural differences, the living condition in hosting centers and the difficult to access health services, could make their health worst. The aim of the PhD research project is to study health status and health determinants, the health policies and practices about migrants to know the situation and eventually propose some recommendations.

**Methods.** Several projects have been activated, like a Web Survey started in collaboration with the ECDC (European Center for Disease Prevention and Control) and the Venice team (Vaccine European New Integrated Collaboration Effort) with the aim of investigating the policies vaccines offered to migrants in EU and EEA countries.

**Preliminary results.** Twenty five countries of EU and EEA countries filled in the survey and two are finalising. Preliminary analysis shows a homogenous situation regarding legal framework/regulations supporting offer to vaccination: 25 countries offer vaccinations to children / adolescents (24 included it into the national immunization plan-NIP). There is a variability for adults as 14 countries offer vaccination in the NIP, 9 offer only some vaccinations, 2 don't offer vaccinations. Differences between countries are observed regarding implementation of immunization strategies and recording of migrant's immunization information data.

**Conclusions.** The results show lack of harmonized strategies and procedures between EU and EEA countries. Given the potential vulnerability and mobility of the target population, it is important for countries to cooperate in order to improve the health of migrants. Studying the different national health policies, their differences and possible uniformity, is a strategic resource to improve the health of migrants.

## UNKNOWN CADAVERS IDENTIFICATION EXHUMED IN THE TERRITORY OF ROME

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**Background.** From 1974 until 2016, there were 729 unidentified bodies in Italy (excluding those drown in the Mediterranean Sea): 168 of those are in Lazio Region. 43,665 persons are missing, 7,519 in Lazio. In 2017 the Office of the Extraordinary Commissioner of the Italian Government for missing people (Ministry of the Interior), started a project for the identification of all the corpses still unknown and buried in the cemeteries of Rome. After 10-20 years they are used to be exhumed, and, since there are no relatives or next of kin taking care of the remains, these bodies are destined for ossuaries. The exhumation is, then, the last attempt to identify them, because of the excellent opportunity to gain access to the body.

**Materials and methods.** This activity involves all the Italian law enforcement, in particular the Italian Carabinieri Army, recruiting an expert in forensic anthropology and odontology, and Medical Examiners from local Universities, in particular from Sapienza University of Rome. The protocol requires that every exhumed corpse is moved to the morgue and analyzed from an anthropological and dental point of view, even if the remains are not completely skeletonized, thanks to the CT scan and the virtual autopsy.

**Objectives.** For each body the anthropological profile is developed (ancestry, sex, age, stature, etc.) as complete and accurate as possible, including data from original documents dating back to the time of body recovery. Possible identities matching are retrieved from the missing persons and the 1:1 comparison is performed applying primary methods for identification according with Interpol Protocols: Forensic Odontology and, in residual cases, DNA. Applying a multidisciplinary approach, we are expecting to have a positive identification for some of the exhumed bodies.

## EVALUATION OF THE EFFECTIVENESS OF A CHRONIC CARE MODEL EXPERIENCE IN ROME

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**Introduction.** Chronic diseases are the leading cause of death and disability in almost all over the world; in Europe causing over 9 million deaths per year according to WHO estimates. A promising health organization model for chronic disease management is represented by the Chronic Care Model (CCM). In the 12th district of the ASL Roma 2 since 4 years was implemented a CCM for the management of patients affected by diabetes and/or at high cardiovascular risk

**Objective.** Aim of this study is to evaluate the effectiveness of the Chronic Care Model (CCM) for the management of chronic disease in terms of mortality reduction, avoidable hospitalizations reduction and improvement of clinical parameters.

**Materials and methods.** A retrospective cohort study will involve patients of 12th district of the ASL Roma 2 affected by diabetes and at high cardiovascular risk assisted through the CCM. Their health outcomes will be compared with those of patients in the same clinical conditions, residents in the same district but not assisted with CCM. The sample will be composed by adults (> 18 years) with a diagnosis of diabetes mellitus type 2 (DM2) or metabolic syndrome and / or arterial hypertension (IT) and two or more risk factors. Outcomes will be mortality from all causes and from causes related to DM and IT, preventable hospitalizations as defined in the Prevention Quality Indicators (PQI) by the Agency for Healthcare Research and Quality, and 10 clinical parameters. The data sources will be the records of causes of death (RENCAM), the hospital discharge records (SDO) and information systems for primary healthcare.

**Conclusions.** Data from the experience of CCM in Tuscany seem promising especially in the evaluation of patient satisfaction and clinical outcomes particularly on cardiovascular and neurological complications and long-term mortality.

## **LPS- AND BACTERIA-INFLAMED MACROPHAGES: INFLUENCE OF LACTOFERRIN IN IRON AND INFLAMMATORY HOMEOSTASIS**

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Microorganisms require iron to multiply and express virulence factors. In particular, bacterial pathogens have developed siderophores, little molecules to acquire iron from the host. In humans the iron availability is under the control of three main proteins: Transferrin (Tf), Lactoferrin (Lf) and Ferritin (Ftn). Tf and Lf are able to sequester two ferric ions per molecule, while Ftn sequesters 4500 iron atoms per molecule. Consequently, the iron acquirement depends from the winner of this battle of chelating agents synthesized by pathogens as well as by host. The correct balance of iron between tissues/secretions and blood, defined iron homeostasis, is regulated by two important factors, hepcidin and Ferroportin (Fpn) which in turn are modulated by IL-6. From this point of view, it is pivotal to analyze the iron homeostasis in macrophages, the most important cells involved in the daily recycling of iron.

Recent researches have demonstrated that in LPS-inflamed macrophages the synthesis of Tf Receptor (TfR) and Fpn is down-regulated while intracellular Ftn is up-regulated by inflammatory stimuli, leading to an intracellular iron overload. Iron overload is a very dangerous condition inducing host susceptibility to infection as well as inflammatory processes. Another important component of iron and inflammatory homeostasis machinery, as reported, is Lf, present in human secretions, like milk, saliva, vaginal fluid, amniotic fluid, upper airway fluid, seminal plasma, the cervical mucus and earwax. Similarly to other proteins of the secretions, Lf is a multifunctional glycoprotein able to protect mucosa from the injury of microbial attachment and colonization as well as to exert anti-inflammatory activity.

In this study, the bovine milk derivative Lactoferrin (bLf), recognized as GRAS by Food and Drug Administration (FDA-USA), is used. In LPS-inflamed macrophages, bLf exerts a potent antiinflammatory activity thus restoring the expression TfR and Fpn and decreasing Ftn up-expression. Firstly, the intracellular iron localization and concentration has been detected in LPS-inflamed macrophages respect to uninflamed ones through phase contrast imaging and X-Ray fluorescence map at Synchrotron of Grenoble (France). Conversely, it is unknown the bLf activity in bacteria-inflamed macrophages.

For this purpose, the experiments will be carried out utilizing facultative or obligate pathogens infecting human macrophages. The synthesis of TfR, Fpn, Ftn and IL-6 will be detected in infected and inflamed macrophages and compared with uninfected and uninflamed phagocytes.

# THE INTRODUCTION OF MANDATORY VACCINATIONS IN ITALY: IMPACT ASSESSMENT AND DEVELOPMENT OF A SUPPORT STRATEGY FOR HEALTH WORKERS

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**Background.** In order to counteract the fall in immunization coverage observed in Italy during the past years, the Italian Government has approved a law decree (then converted in Law 119/2017), obliging all preschool pupils (aged 0-6) to be immunized against 10 vaccine-preventable diseases to be admitted to state-run nurseries and kindergardens.

**Objectives.** The project aims to assess the impact of the mandatory vaccinations policy on the various actors involved in its implementation (vaccination centres, schools, parents) and to formulate a strategy to support health workers working in family care centres for the dissemination of correct information on vaccinations to parents. In particular, the specific objectives will be: to assess the impact of the policy on parents' attitudes regarding vaccinations; to evaluate the capacity of health staff working in local vaccination centres to respond to the increased demand for vaccines; to assess the capacity of school staff to control the vaccination status of their pupils; to develop a training and communication strategy to be implemented in family care centres to support vaccinations' acceptance among parents.

**Preliminary results.** Preliminary data on vaccination coverage in 2017 show that the new law seems to be working: one-third of the previously unvaccinated children born in 2011-15 have now been immunized, and polio and measles vaccine uptake has increased by 1% and 2.9%, respectively. No data are available yet on the impact on parental attitudes on vaccination nor on barriers to the policy implementation at the local level. A survey on the midwives working in family centres of Rome Province is ongoing to assess their knowledge and attitudes on vaccinations, in order to develop tailored training and communication strategies.

**Conclusions and perspectives.** The existence of a gap between what was planned and what occurs as a result of a policy is common, but little research is conducted on this topic. The project will provide useful elements for assessing the actual impact of the mandatory vaccinations policy's implementation in Italy, with the ultimate objective of contributing to the development of health policy guidelines for the provision of vaccination services.

## **SOCIAL IMPACT OF WORK-RELATED STRESS IN DIFFERENT WORK TASKS**

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**Background.** Work-related stress is a very complex social problem linked to aspects of the different natures of the work itself including: organizational, physical, social and environmental. Work-related stress can be considered as an emotional, cognitive, behavioral and physiological reaction to these adverse aspects, and can be physically harmful, harmful to an individual's social environment, and harmful to an individual's work organization; all of these stressors determine the psychophysical conditions that can hinder the body's responses aimed at re-establishing the condition preceding the stress stimulus. In the literature, numerous studies believe that stress is at the base of both psychiatric diseases such as anxiety, irritability, insomnia, panic attacks, difficulty concentrating and pathologies such as: hypertension, tachycardia, gastro-intestinal disorders, reduction of immune defenses and cognitive and emotional disorders. Today stress-related syndromes are now accepted in many European countries including Italy (D.M. 27/04/2004). In Italy, the current legislation (Legislative Decree 81/08 S.M.I.), according to the contents of the European agreement of 8 October 2004, recognizes work-related stress as an element to be included in risk assessments.

**Objectives.** The objective is to assess the subjective stress of 200 subjects with different duties at the same company through the use of a "questionnaire-indicator tool" Health and Safety Executive (HSE) containing 35 items. The objectives of the project are as follows:

- 1) To evaluate work-related stress throughout the working population and then subdivide it by gender and age.
- 2) To evaluate the presence of a correlation between the stress levels (obtained from the questionnaire) and job title.
- 3) To evaluate the social impact of work-related stress.

**Preliminary results.** The project has developed through the evaluation of the most recent national and international literature. Particular attention has been paid to the problems considered by the various authors on how to use the HSE questionnaire in the various work activities covered by the research herein. Agreements were made for the administration of the questionnaire to a large Italian public company, thereby, an initial statistical sample has been found that will be significant to the HSE questionnaire when administered.

**Conclusions and perspectives.** From the results of this survey, I would like to highlight the possible work and social factors that demonstrate the greater cause of stress in workers depending on their specific tasks.

# UNDERSTANDING THE EPIDEMIOLOGY OF AUSTISM FROM PROVIDERS PERSPECTIVE IN MOZAMBIQUE: AN EXPLORATORY STUDY

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**Objectives.** The present study aims to analyse the epidemiological situation of autism in Mozambique, to find out what are the main mechanisms to identify and to diagnose a case and who are the most affected, in order to understand the distribution of cases and create more awareness amongst the providers and more evidence, since autism is not well known yet in Mozambique and research is lacking. To reach the main objective, the author conducted in-depth discussions with health professionals at health facilities, Ministry of Health (MoH), Municipalities, autism associations and some schools dealing with this target group.

**Preliminary results.** The majority of health professionals (clinicians), have knowledge about the existence of autism. Suspected cases are referred to psychologists and psychiatrists. Though, at the health facility level, there is lack of mechanisms for effective diagnosis. At this point, autism is clinically diagnosed and followed up in Infulene, a Psychiatric Hospital, Provincial Hospital of Matola, Central Hospital of Maputo and Mavalane. In other provinces of the Country, the MoH is conducting on-going job training at the health facilities level, in order to scale up and decentralize care. At the community level, the MoH is engaged in working closely with the parents and caregivers of the children with autism, training groups of parents in how to deal with the child and encourage them not to give up the therapies. In addition, the community is educated in order to create more awareness and reduce stigma as well. Cases are distributed in age and sex. Male are the most affected by the condition. Many cases are found at the school age of 6 by professors, whom then refer to the nearest health facility or to psychologists in charge at school. There is no data about prevalence stratification in geographical locations (rural, urban areas), and economical status of the cases.

**Conclusions and perspectives.** The MoH of Mozambique is engaged in specializing and decentralizing the process to the health facilities level. Health professionals are being closely supported and monitored. They are developing strategies to involve the community and caregivers of children with autism. One of the main gaps is the unavailability of quantitative data about autism in the Country. Therefore, more research is needed to better understand the prevalence and distribution of cases.

# INFECTIONS CAUSED BY MULTIDRUG RESISTANT MICROORGANISMS IN A COHORT OF TRAUMA PATIENTS

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Trauma following falls and car accidents is one of the most common cause of death worldwide; infections are the leading cause of death among trauma patients, especially because severe injuries deeply modify the integrity of skin and mucous membranes, reducing the efficacy of immune response. Admission to an Intensive Care Unit is correlated to a poor outcome, because of the increased probability to acquire nosocomial infections, especially those caused by multidrug resistant organisms.

**Objectives.** The aim of this research was to evaluate the impact of infections caused by multidrug resistant organisms in a group of patients suffering from severe trauma (as defined by an Injury Severity Score  $\geq 50$ ). A prospective observational study was performed, since November 2017, in the Intensive Care Unit of “Santa Maria Goretti” Hospital (Latina). For every trauma patient we collected data such as the incidence of infections, microbiologic results, and the antibiotic treatment. For the definitions of infection, we referred to the NNHIS criteria. 30-day mortality rate was recorded.

Moreover, we are collecting data about patients colonized by multidrug resistant Gram negative microorganisms, and eligible for surgical operations, to understand if colonization correlates with an increased risk of infection following surgery.

**Preliminary results.** From November 2017, 40 patients experiencing severe trauma were admitted in the Intensive Care Unit (Injury severity Score  $\geq 50$ ), all mechanically ventilated, of median age 32 years (range 16-60). 66% of people developed an infection during hospital stay, and 25% acquired more than one infection. Most frequently diagnosed infections were Ventilator-Associated Pneumonia (32%) and catheter-related bloodstream infections (29%). Multidrug-resistant organisms were observed in 82% of cases, and the most frequently involved bacteria was *Klebsiella pneumoniae*, characterized in all cases by resistance to carbapenems (MIC  $\geq 16$ ). The 30-days mortality was 7,8%, and only in one case infections turned to be the cause of death. All infections were treated with combined antibiotic treatment, rather than monotherapy.

**Conclusions and perspectives.** The impact of infections caused by multidrug resistant organisms in trauma patients is considerably high. In our small cohort of patients, ventilator associated pneumonia was diagnosed in one third of cases. Despite the high incidence of multidrug resistant organisms, deaths were not attributed directly to infections, except in one case. Due to the lackness of drugs against resistant microbes, combined antibiotic treatment demonstrated to be effective in nosocomial infection control, particularly among trauma patients.



# PREVENTION OF MOTHER-TO-CHILD TRANSMISSION OF HIV IN THREE DIFFERENT REGIONS OF CAMEROON: DETERMINANTS AND BARRIERS AFFECTING MOTHER-CHILD HEALTH IN RESOURCE-LIMITED SETTINGS

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**Background.** The Prevention of Mother to Child Transmission (PMTCT) of HIV is the result of different activities that are implemented with the aim to reduce the risk of HIV vertical transmission. In sub-Saharan African countries, including Cameroon, almost 90% of HIV infected children have acquired the infection from their mother. In Cameroon, the HIV seroprevalence is estimated at 4.3% and 7.2% among the general population and pregnant women respectively. The efficacy of PMTCT of HIV is not homogeneous within the Cameroon, and underlined factors have not been elucidated. This study aims to compare the factors influencing the PMTCT practices and results in the context of three different regions (West, North and South) of Cameroon.

**Methodology.** We opted for a documentary cross-sectional study, with involvement of a case-control component conducted over 4 years (2015-2018). Data on PMTCT of HIV will be collected by the consultation of specific registries (pre-natal consultations, maternity, vaccination and pediatric services) available in the health facilities involved. The transverse part of the study will be conducted using a specific questionnaire administered in face-to-face modality to HIV+ women beneficiaries of PMTCT activities in order to investigate factors influencing the efficacy of the prevention. Moreover, an observational survey will be conducted in order to compare the growth, morbidity and mortality of children (up to 2 years) born from HIV positive and negative mothers. The collected data will be processed and analyzed using the Epi-Info 7 and SPSS 22 software, with a significance threshold of 0.05.

**Expected results.** Thanks to this study, we expect to assess in a real life context the efficacy of PMTCT of HIV in different regions of Cameroon, as well as all factors or barrier that may affect its impact. Moreover, by comparing children born from HIV positive and negative mothers, we will assess differences and related factors in term of growth, morbidity and mortality.

**Conclusion and perspectives.** The results of this study will be useful for having a clearer picture of PMTCT of HIV program in a real life context of three different regions of Cameroon, as well as for the identification of factors affecting the mother-child health in resource-limited settings.

# BIOTRANSFORMATION OF SYNTHETIC CANNABINOIDS IN HUMAN LIVER MICROSOMES

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**Background.** Synthetic Cannabinoids (SCs) are a group of emerging drugs belonging to Novel Psychoactive Substances (NPS) class. These compounds, marketed as “spice”, “legal high”, “K2” and many other names, are sold over the Internet not for “human consumption”. SCs are worldwide abused owing to their cannabis-like effect, because these drugs bind the same receptors as  $\Delta^9$ -tetrahydrocannabinol, the primary psychoactive component in cannabis, but they produce more potent effects than tetrahydrocannabinol. Because of the rapid production of new generation analogues of synthetic cannabinoids by clandestine manufacturers to evade scheduling laws, the investigation of the metabolic pathways of these substances is of particular importance for drug control and forensic toxicology purposes.

**Aims.** The aims of the PhD thesis are to investigate the metabolic profile of some synthetic cannabinoids by Human Liver Microsomes (HLM) incubation and suggest appropriate markers to identify their intake in clinical or forensic cases.

**Expected results.** HLMs will be incubated with SCs in presence and absence of Nicotinamide Adenine Dinucleotide Phosphate (NADPH), a necessary cofactor for Cytochrome P450 (CYP450) oxidase activity, to generate the spectrum of their metabolites. After a complete depletion of the parent drugs, metabolites will be detected and identified with different hyphenated liquid chromatography techniques.

**Conclusions and perspectives.** The first phase of the project will lead to the optimization of HLM incubation conditions. Once the spectrum of the metabolites is produced, they will be identified by different hyphenated liquid chromatography techniques. The next steps will lead to compare these metabolites with those produced by human liver cells, a much more expensive and complex system than HLMs. Hepatocytes will produce both phase I and phase II metabolites in the correct abundances. The final objective will be the study of the metabolic patterns produced *in vitro* and the comparison with metabolites of real human urine samples to improve the interpretation of urinary markers after SCs intake.

# **CHARACTERIZATION OF INVASIVE NEISSERIA MENINGITIDIS SEROGROUP C ISOLATED IN ITALY**

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Since Meningococci of serogroup C (MenC) belonging to clonal complex (cc) 11 are considered highly virulent and able to cause outbreaks, it is important to identify and characterize this aggressive, vaccine preventable strain. In Italy, the introduction of the Meningococcal C Conjugated vaccine (MCC) in 2005 has led to a reduction in the cases of serogroup C disease mostly among children for whom the vaccination is targeted. However, Invasive Meningococcal Diseases (IMD) due to MenC:cc11 strain are still spreading through the country with high morbidity and mortality.

The aims of this project are as follows: 1) molecular characterized the invasive *N. meningitidis* serogroup C collected in the country using Whole Genome Sequencing (WGS); 2) compare the genome of strains from sporadic cases with those from outbreak cases in order to identify specific genes signatures peculiar of hypervirulent MenC:cc11 strain; 3) evaluate phylogenetic relationships and, the strain origin of MenC using a Bayesian approach.

Bacterial isolates and clinical samples (blood or cerebrospinal fluid) from IMD cases are collected and characterized by the National Reference Laboratory at Istituto Superiore di Sanità in Rome. Phenotypic and genotypic characteristics, including serogroup identification, Multilocus Sequence Typing (MLST), antigen finetype, will be performed following standard procedures. The complete genome sequences of meningococcal isolates will be obtained using Illumina MiSeq Platform and analysed through cgMLST to compare the genomes with those deposited in the Neisseria.org website. Phylogenetic analysis will be performed using Bayesian skyline plot (BSP) model.

Up to now, a total of 10 meningococci serogroup C from IMD cases were identified and characterized. The main genetic formula is C:P1.5-1,10-8:F3-6:ST-11(cc11) in 5 isolates, followed by C:P1.5,2:F3-3:ST-11(cc11) (N=3), C:P1.21-15, 16-50:F1-7:cc10217 and C:P1.7-4,14-6F3-9:ST-1031(cc334) in the remaining. We will expect to analyse all the strains received within the National Surveillance System for Invasive Meningococcal Diseases to a complete characterization following the aims of the project framework. The data that will be obtained from this study will permit to delineate the main traits of these virulent strains in Italy.

## **TOXICOLOGICAL AND LEGAL ASPECTS ON ROAD SAFETY**

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This project aims to plan and to implement *ad hoc* protocols for management of forensic toxicological analysis in compliance with the Italian laws on road safety (artt. 119, 186, 186-bis, 187 c.d.s., art. 589-bis and 590-bis c.p.), engaging Law Enforcement Agencies, National and Regional Institutions, Health-care personnel and forensic toxicology laboratories.

These protocols will be conformed the forensic toxicological and medicolegal requirements and will punctually describe the analysis purposes and the operational modes. In particular, the operational modes deal with all the necessary procedures including the request modality by Law Enforcement Agencies and the informed consent. Special attention is focused on the collection and management of biological samples, the chain of custody and the analytical toxicological analysis.

Development and validation of specific analytical methods are a second goal of this project. In particular, methods for detection and quantification of alcohol and its direct markers, such as ethyl-glucuronide and fatty acids ethyl esters and illicit drugs (and their metabolites) in various biological matrices (i.e. blood, urine, oral fluid, scalp and body hair). Besides classical drugs of abuse, the so called “New Psychoactive substances” (NPS) will be also monitored with the application of the most modern analytical techniques. As future perspectives, these protocols are expected to sustain the already present road safety measures by means of improving the detection ability regarding the use and abuse of the most common psychotropic substances as well as NPS, negatively affecting the driving performances.

# ORGANIZING THE PALLIATIVE CARE, THE NURSING CARE FOR THE PATIENTS IN THE ADVANCED STAGES OF MALIGNANT DISEASES IN THE CITY OF VLORA

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**Background.** International health institutions recommend the development of palliative medicine, which requires the development and improvement of organizing structures and the training of qualified individuals, in order to offer the functional service and guarantee respect for the patient. In 2010, Non Communicable Diseases (NCDs) in Albania accounted for about 88% of all deaths (55% cardiovascular diseases and 19% cancer; GBD, 2010). Albania has thus joined the majority of European countries that face the NCDs epidemic as its most important public health challenge.

**Objectives.** This project aims to develop a research for organizing the nursing care for patients on advanced stages of malignant diseases, in order to improve their condition and, above all, to evaluate patients in the terminal states of their diseases. The second objective is to evaluate and improve information on the nursing care needed to properly treat such palliative conditions.

**Expected results.** The project will be implemented in the city of Vlora, in the municipality of Novosele, where we will administer a questionnaire adapted from EU-EuroPall "Europall Palliative Care Services Questionnaires". In the city of Vlora, palliative care is a new service, non adequate and very often lacking, despite the needs of patients. In the community of Novosela palliative care does not exist and people do not have information on the available instruments to assess patients' symptoms, such as pain, e.g. the WHO analgesic scale, Braden scale, Norton scale, SDS (Symptom Distress Scale), etc. According to the information needs, there are several priority needs for a training program on the care and management of palliative care.

**Conclusions.** From what was studied and observed, palliative care does not exist yet and there is a strong need to improve information to individuals.

# PREJUDICE OF THE PARENTS AS A DETERMINING FACTOR FOR ADHERENCE TO THE VACCINATION CAMPAIGN AGAINST HUMAN PAPILLOMAVIRUS. A CONFRONTATION BETWEEN BRAZIL AND ITALY

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**General Objective.** To identify the reasons of refusal of Brazilian and Italian adolescents's parents targeted by the Immunization Programs to receive the vaccination against Human Papillomavirus (HPV) during vaccination campaigns in Brasil and Italy.

**Specific Objectives.**

- To compare the data of vaccination campaigns against HPV between Brazil and Italy.
- To identify sociodemographic data, educational level and specific knowledge of parents of adolescents about the HPV vaccine.

**Expected results.** It is hoped that this research will identify the factors contributing to the non-adherence of adolescents to the HPV vaccination campaign and provide the competent authorities with reliable information for the development of new public policies that favor the target audience for HPV vaccine.

**Conclusion.** The vaccination against HPV was included in Brazilian and Italian Immunization Programs for adolescents and did not reach the goal expected by the health authorities. Parents' educational levels, religious beliefs, and knowledge about HPV immunobiology may be directly associated with the decision of parents to allow their children to be vaccinated, making it particularly difficult to prevent cervical cancer.



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