

**New Trends on  
Sensing - Monitoring - Telediagnosis  
for Life Sciences**

NT SMT-LS 2014

Brasov, Romania, July 24-26, 2014

**BOOK OF ABSTRACTS**



**Editors**

Mihaela BADEA  
Marius MOGA  
Patrizia RESTANI  
Jean-Louis MARTY

**LUX LIBRIS PUBLISHING HOUSE**

**International Conference**  
**New Trends on Sensing - Monitoring - Telediagnosis**  
**for Life Sciences**

**NT SMT-LS 2014**

**Brasov, Romania, July 24-26, 2014**

**BOOK OF ABSTRACTS**

Editors

Mihaela BADEA  
Patrizia RESTANI

Marius MOGA  
Jean-Louis MARTY

**ISBN 978 - 973 – 131 – 280 - 4**

**LUX LIBRIS PUBLISHING HOUSE**  
2014

ISBN 978 - 973 - 131 - 280 - 4



9 789731 312804



Transilvania  
University of Brasov,  
Romania



MINISTERUL  
EDUCAȚIEI  
NAȚIONALE



International  
Association  
of Online  
Engineering

**IAOE.**



EURACHEM  
Romania



County Council  
Brasov



**UPVD**  
Universitatii de Pitesti



**SPONSORS**



Biomedica - Multimedialitate Româna S.R.L.



Râșnov, Brașov  
Str. Panseluțelor, Nr. 22  
tel/fax: 0268230181  
mobli: 0737147687  
E-mail: luxlibris@gmail.com

**International Conference**

**New Trends on Sensing - Monitoring - Telediagnosis  
for Life Sciences**

**NT SMT-LS 2014**

**Brasov, Romania, July 24-26, 2014**

# **BOOK OF ABSTRACTS**

Editors

Mihaela BADEA  
Patrizia RESTANI

Marius MOGA  
Jean-Louis MARTY

**ISBN 978 - 973 – 131 – 280 - 4**

**LUX LIBRIS PUBLISHING HOUSE**  
2014

### **Honorary President of the Conference**

- **Ioan Vasile ABRUDAN, Rector** - Transilvania University of Brasov, Romania

### **Conference Chairpersons**

- **Mihaela BADEA**, Transilvania University of Brasov, Romania
- **Marius MOGA**, Transilvania University of Brasov, Romania
- **Patrizia RESTANI**, Università degli Studi di Milano, Italy
- **Jean-Louis MARTY**, University of Perpignan Via Domitia, France

### **International Scientific Committee**

- **Ioan Vasile ABRUDAN**, Transilvania University of Brasov, Romania
- **Michael AUER**, Carinthia University of Applied Sciences Villach, Austria
- **Mihaela BADEA**, Transilvania University of Brasov, Romania
- **Doina Paula BALABAN**, Ovidius University Constanta, Romania
- **Nicusor BIGIU**, Transilvania University of Brasov, Romania
- **Elena BOBESCU**, Transilvania University of Brasov, Romania
- **Vincenzo BRANDOLINI**, University of Ferrara, Italy
- **Daniela BRATOSIN**, National Institute R & D for Biological Sciences, Romania
- **Victoria BURTEA**, Transilvania University of Brasov, Romania
- **Codruta Simona COBZAC**, Babes-Bolyai University of Cluj-Napoca, Romania
- **Gheorghe COMAN**, Transilvania University of Brasov, Romania
- **Lucian CURTU**, Transilvania University of Brasov, Romania
- **Daniela DANCULESCU**, University of Craiova, Romania
- **Mihaela EMANDI**, Direction of Public Health, Brasov, Romania
- **Denis ENACHESCU**, University of Bucharest, Romania
- **Cornelia ENACHESCU**, Institute for Mathematical Statistics and Applied Mathematics, Bucharest, Romania
- **Laura FLOROIAN**, Transilvania University of Brasov, Romania
- **Mladen FRANKO**, University of Nova Gorica, Slovenia
- **Laura GAMAN**, Carol Davila University of Medicine and Pharmacy, Bucharest, Romania
- **Alice GOOD**, University of Portsmouth, UK

- **Diana Bueno HERNANDEZ**, Sección de Bioelectrónica, Ingeniería Eléctrica, CINVESTAV, Mexico
- **Gabriela GARBAN**, Ministry of Health, National Institute of Public Health, Regional Center Timisoara, Romania
- **Eugen GHEORGHIU**, International Centre of Biodynamics, Bucharest, Romania
- **Stefano GIROTTI**, University of Bologna, Italy
- **Dan GRIGORESCU**, Transilvania University of Brasov, Romania
- **Anca Elena GURZAU**, Babes Bolyai University Cluj Napoca, Environmental Health Center Cluj Napoca, Romania
- **Eugen Stelian GURZAU**, Iuliu Hatieganu University of Medicine and Pharmacy Cluj Napoca, Babes Bolyai University Cluj Napoca, Environmental Health Center Cluj Napoca, Romania
- **Dubravka JURETIC**, Croatia
- **Tamas KOSZEGI**, University of Pecs, Hungary
- **Simona Carmen LITESCU**, National Institute for Biological Sciences, Centre of Bioanalysis, Romania
- **Marijana Vu i LOVRENCIC**, Clinical Institute of Medical Biochemistry and Laboratory Medicine, Zagreb, Croatia
- **Jean Louis MARTY**, University of Perpignan Via Domitia, France
- **Radovan METELKA**, University of Pardubice, Czech Republic
- **Aurel MIRONESCU**, Transilvania University of Brasov, Romania
- **Marius MOGA**, Transilvania University of Brasov, Romania
- **Ioana MOISIL**, Lucian Blaga University of Sibiu, Romania
- **Sorin MORARU**, Transilvania University of Brasov, Romania
- **Maria Cruz MORENO BONDI**, Complutense University of Madrid, Spain
- **Roberto MUNOZ GUERRERO**, Sección de Bioelectrónica, Ingeniería Eléctrica, CINVESTAV, Mexico
- **Florentina-Daniela MUNTEANU**, Universitatea "Aurel Vlaicu" din Arad, Romania
- **Monica NEAGU**, National Institute Victor Babes Bucharest, Romania
- **Gilvanda NUNES**, University of Maranhao, São Luís, Maranhao, Brazil
- **Alina PASCU**, Transilvania University of Brasov, Romania
- **Mariana RADOI**, Transilvania University of Brasov, Romania
- **Gabriel-Lucian RADU**, Polytechnic University Bucharest; National Institute of Research and Development for Biological Sciences, Centre of Bioanalysis, Romania

- **Cristian RAVARIU**, Polytechnic University of Bucharest, Romania
- **Patrizia RESTANI**, University of Milan, Italy
- **Liliana ROGOZEA**, Transilvania University of Brasov, Romania
- **Abdel-Badeeh SALEM**, Ain Shams University, Abbasia, Cairo, Egypt
- **Cornel SAMOILA**, Transilvania University of Brasov, Romania
- **Livia SANGEORZAN**, Transilvania University of Brasov, Romania
- **Francesco SICURELLO**, University of Milan-Bicocca, Italy
- **Dana SIMIAN**, Lucian Blaga University of Sibiu, Romania
- **Irina STOIAN**, Carol Davila University of Medicine and Pharmacy, Bucharest, Romania
- **Doru TALABA**, Transilvania University of Brasov, Romania
- **Cristiana TANASE**, National Institute Victor Babes Bucharest, Romania
- **Diana TINT**, Transilvania University of Brasov, Romania
- **Michael THOMPSON**, University of Toronto, Canada
- **Polonca TREBSE**, University of Ljubljana, University of Nova Gorica, Slovenia
- **Aurelia TUBARO**, University of Trieste, Italy
- **Alina VASILESCU**, International Centre of Biodynamics, Bucharest, Romania
- **Karel VYTRAS**, University of Pardubice, Czech Republic
- **Doru URSUTIU**, Transilvania University of Brasov, Romania
- **Nicolae Victor ZAMFIR**, National Institute of Physics and Nuclear Engineering “Horia Hulubei”, Bucharest, Romania
- **Danilo Garbi ZUTIN**, Carinthia University of Applied Sciences Villach, Austria

### **Organizational Committee**

**Laura FLOROIAN – President**

Members - Mihaela BADEA, Nicusor BIGIU, Maria Elena COCUZ, Mihaela CONSTANTINESCU, Chiara DI LORENZO, Lorena DIMA, Andreea FLEANCU, Dan GRIGORESCU, Jean-Louis MARTY, Marius MOGA, Ioana NICOLAE, Andrada NICOLAU, Alina PASCU, Dorina POPA, Bianca POPOVICI, Elena POZNA, Cristian RAVARIU, Patrizia RESTANI, Arianna Sonia SCOLLO, Gabriela SECHEL, Irina STOIAN, Nicoleta TAUS

## CONTENTS

### 1. New Sensors for Food Control and Forestry

Code	Lecture (or poster) title - Authors
PL.1.1. (18)	Bioassay and electrochemical biosensors for the determination of the antioxidant capacities: potential applications G. Catanante, C. Calas-Blanchard, J-L Marty
PL.1.2. (19)	HPTLC: new applications in the fields of food and food supplements P.Restani, F.Colombo, G.Frigerio, E.Moro, C.Di Lorenzo
K.1.1. (20)	Purification and preconcentration of mycotoxins and its metabolites by molecularly imprinted adsorbents for biomedical analysis R. Gadzała-Kopciuch, K. Kwa niewska, B. Buszewski
K.1.2. (21)	Challenges in the development of biosensors for food allergens: example of gliadin A. Vasilescu, I.Mihai, A. Vezeanu
O.1.1. (22)	Disposable nanoceria based electrochemical sensor for the detection of phenolic wine antioxidants V. Andrei, E. Sharpe, S. Andreescu, A. Vasilescu
O.1.2. (22)	Total antioxidant capacity assays -tools to predict heating associated oxidative modifications of vegetable oils I. Stoian, L. Iosif, D. Prundurelu, L. Gaman, M. Gilca, V. Atanasiu
O.1.3. (24)	Monitoring the total antioxidant capacity as a tool in controlling the wine-making process. Characterization by electrochemical and spectrophotometric methods V. Andrei, A. Tudorache, E. Branduse, A. Vasilescu
O.1.4. (25)	Studies regarding the level of some contaminants in food supplements G. Garban , C. Neniu, A. Negrea, Z. Garban
O.1.5. (26)	Determination of ammonia and putresceine in beef extract powder using voltammetric sensors I.M. Apetrei, C.V. Popa (Ungureanu), C. Apetrei



O.1.6. (27)	Carboline analysis with an amperometric biosensor based on monoamine oxidase inhibition M. C. Radulescu, B. Bucur, M.P. Bucur, G. L. Radu
O.1.7. (28)	Thin layer chromatography coupled with image processing C.S. Cobzac
O.1.8. (29)	New SPR-based aptasensor for detection of allergenic lysozyme in food I. Mihai, A. Vasilescu
O.1.9. (30)	Miniaturized sensors for pesticides detection in food C. Moldovan, R. Iosub, B. Firtat, C. Codreanu, L. Drechsel, N. Paust, W. Weigel, S. Ivanov-Pankov, I. Stan
O.1.10. (31)	Challenges in the development of an electrochemical aptasensor for lysozyme detection in wine A. Vezeanu, A. Vasilescu
O.1.11. (32)	Aptasensors for food control. (Electro)chemical immobilization and measurements G. Istamboulie, N. Paniel, L. Barthelmebs, T. Noguer
O.1.12. (33)	Integrated biosensors using active electronic devices C. Ravariu, M. Gherasim, A. Glavan, B. Robu, M. Badea, M. Chitu
P.1.1. (34)	The electrocatalytic oxidation of peroxyxynitrite at a modified co(ii) phthalocyanine glassy carbon electrode I.S. Hosu, M. Badea - Doni
P.1.2. (35)	Biosensing platform based on AOT-stabilized prussian blue, a non-conducting copolymer and oxidase enzymes for food analysis by flow injection analysis M. Badea – Doni, E. Ocnaru, M.-L. Jecu, G. Vasilescu, A.F. Danet
P.1.3. (36)	Laser photoacoustic spectroscopy for quality evaluation of fruits and vegetables A. M. Bratu, C. Popa, S. Banita, M. Patachia, C. Matei, M. Petrus, D. C. Dumitras
P.1.4. (37)	Sustainable development by recycling waste as compost I. Manciualea, L.Dumitrescu

P.1.5. (38)	Variability of nutritive macroelements and microelements in sessile oak ( <i>Quercus letraea</i> Liebl.) leaves from Piedmont VI deni R.E.Enescu, C.C. V c lie, Gh. Spârchez.
P.1.6. (39)	Forest certification: voluntary instrument for promoting sustainable management A.F. H l li an, M. Marinchescu
P.1.7. (40)	Electrochemical impedance spectroscopy for mycotoxin detection A. Scollo, L. Floroian, A. Perini, A. Vasilescu, P. Restani, M. Badea
P.1.8. (41)	Microwave versus electrical oven heating influence on oxidative stress parameters of different commercial cooking oils L. Iosif, D. Prundurelu, L. Gaman, M. Gilca, V. Atanasiu, I. Stoian
P.1.9. (42)	<i>Rosmarinus officinalis L.</i> - phytochemical and pharmacological study D. Hanganu, A. M rculescu, B. Sevastre, R.F. Brînzan, N.K.Olah, D. Benedec, O. Raita, A. Popa, D. Toloman, C. Bele, S. Socaci
P.1.10. (43)	General perception of students concerning the topic of mycotoxins A. Huzuna, M. Badea
P.1.11. (44)	Comparison of volatile compounds in Romanian <i>Mentha piperita</i> and <i>Mentha spicata</i> by headspace and hydrodistillation techniques I. Mihai, M. Buleand , Z. Moldovan, I. G. David, E. Oprea, I. Adriana-Badea
P.1.12. (45)	Classification and fingerprinting of sea-buckthorn ( <i>Hippophae rhamnoides</i> ), bilberry ( <i>Vaccinium myrtillus</i> ) and cranberry ( <i>Vaccinium vitis-idaea</i> ) dietary supplements by UV-Vis spectroscopy and multivariate exploratory techniques I.A. Sima, C. Sârbu, R.D.Na cu-Briciu
P.1.13. (46)	The impact of ultraviolet radiation on fungal load of certain spices, used in meat industry V. Necula, M. Babii, M. Boicu, N. Taus, A. Macri

P.1.14. (47)	Determination of anthocyanin pigments in potato using specific contact sensors and analytical methods F. Dam a, A. Woinaroschy, G. Olteanu
P.1.15. (48)	Soil resources and agricultural crops vegetation status monitoring by using specific and precision sensors I. Puiu, G. Olteanu, A. M rculescu, A. Ghinea, F. Dam a
P.1.16. (49)	Cleaning procedures for ochraroxin A detection A. Perini, A. Scollo, P. Restani, M. Badea
P.1.17. (50)	Food antioxidants and their benefits for a healthy diet C. Popa, M. Moga, M. Badea
P.1.18. (51)	The influence of the alimentation pattern in adolescents health in Brasov region B. Popovici, M. Mitrica, A. Cosor
P.1.19. (52)	Aflatoxins detection using rapid tests A. Scollo, A. Perini, P. Restani, M. Badea
P.1.20. (53)	New approaches for the assessment of antioxidant activity in food and food supplements C. Di Lorenzo, F. Colombo, G. Frigerio, E. Moro, M. Dell'Agli, P. Restani
P.1.21. (54)	Food allergens topic presented in online media and population knowledge M. Ianovici, B. Popovici, M. Moga, M. Badea
P.1.22. (55)	Milk intolerance or milk allergy? R. Diaconu, D., Pal, B. Popovici, M. Mitrica, M Badea
P.1.23. (56)	Celiac disease vs. gluten intolerance vs. wheat allergy. Mechanisms and diagnosis V. Dinu, A. Murea, B. Popovici, M.Mitrica, M.Badea
P.1.24. (57)	Mycotoxins determination by thin layer chromatography coupled with image processing C.S. Cobzac, M. Badea

## **2. Integrative Environmental Sciences**

<b>Code</b>	<b>Lecture (or poster) title - Authors</b>
PL.2.1. (60)	Environmental monitoring of pesticides by using bioanalytical techniques G. S. Nunes
K.2.1. (61)	The influences of endocrine disruptors on the early onset of menopause M. Moga, N. Bigiu, A. Plotogea, M. Badea, A. Pascu
O.2.1. (62)	Salivary cotinine and passive smoking in adults C. Nuca, D.P. Balaban, V. Badea, A. Caraiane
O.2.2. (63)	Monitoring system of air quality A. Voina, G. Alecu, C. Ravariu, C. Voina
O.2.3. (64)	Environmental pollution and pulmonary disease M. Badea, C. Gavris, M. Emandi, M. Moga, J.L Marty, M. Radoi
P.2.1. (65)	Photoacoustic detection of pollutant trace gases from a multicomponent mixture sample I. R. Ivascu, C. E. Matei, M. Patachia, A. M. Bratu, D. C. Dumitras
P.2.2. (66)	Quantitative determination and voltammetric behaviour of pesticide iminoctadine R. Metelka, S. Smarzewska
P.2.3. (67)	Reactions and toxicity of selected sun protection compounds in waters G. Grbovi , O. Malev, R. Sauerborn Klobu ar, Ž. Cvetkovi , B. Cvetkovi , D. Dolenc, T. Tišler, A. Lebedev, M. Sarakha, P. Trebše
P.2.4. (68)	Biosensors for pesticides detection in surface water GS. Nunes; I.N.M. Ferreira, F.G.S Silva, M.Badea,
P.2.5. (69)	Heavy metals detection using electrochemical and enzyme-catalysed methods L. Chelmea, C. Faraian, L. Floroian, Gh. Coman, G. S. Nunes, M. Badea
P.2.6. (70)	Endocrine disruptors and maternal behaviour N. Bigiu, M. Moga, C.Glavce

P.2.7. (71)	Community risk assessment in. Brasov county following exposure to "polluted" air M. Emandi, M. Badea, M.Moga, L. Rogozea
----------------	-----------------------------------------------------------------------------------------------------------------------------

### **3. Telediagnosis for Medicine**

<b>Code</b>	<b>Lecture (or poster) title - Authors</b>
PL.3.1. (74)	M-Health project DIABESITY 2.0 for self management care F. Sicurello, G. Mauri, G. Castelnuovo, E. Santoro, S. Pruna, M. Clarke, R. Bassetto, A. Hajdu, L. Kovacs, L. Lhotska
K.3.1. (75)	Proteomics - new tools for personalized medicine C. Tanase, E. Codrici, D. Popescu, S. Mihai, A.M. Enciu, A. Nita, R. Albuiescu
K.3.2. (76)	Periodontal risk analysis based on salivary cotinine and other microbiological and biochemical salivary factors C. Nuca, D.P. Balaban, V. Badea, A. Caraiane
O.3.1. (77)	Telemedicine in Romania – an ethical challenge for authorities L. Rogozea, D. Purcaru, I. Bârsan, M. Badea, E. Banu, A. Repanovici
O.3.2. (78)	Predictive data mining techniques applied in healthcare management I. Moisil, L.G. Bera
O.3.3. (79)	Human breath biomarker for clinical diagnosis by photoacoustic spectroscopy technique C. Popa, S. Banita, M. Patachia, C. Matei, A. M. Bratu, M. Petruș, D. C. Dumitras
O.3.4. (80)	Forensic filiation testing, the scientific evidence which transfers the paternity determination issue from the judicial field to the field of medicine I. Nicolae
O.3.5. (81)	Mental health and technology: an approach for patients with depressive disorder M. Bran, M. Ladea, V. Briciu, N.Petcu
O.3.6. (82)	FI-STAR online personalised cardiac rehabilitation solution S.S. Busnatu, C. Sinescu

O.3.7. (83)	Electrical storms in patients with an implantable cardioverter defibrillator D. Tint, F.O. Ortan, S. Micu
O.3.8. (84)	Considerations on the monitoring people with various pathologies I.D. Carpus
O.3.9. (85)	Biomarkers in diagnosis and assessment of systemic diseases T. Koszegi, Z. Horvath-Szalai, P. Kustan
O.3.10. (86)	Telemedicine: a great opportunity for recovery by kinetotherapy in limb trauma D. O. Grigorescu, S. Grigorescu
O.3.11. (87)	Research on optimizing treatment of pregnant women with cardiovascular disorders I.D. Carpus, V. Stoleru
O.3.12. (88)	The usefulness of the burns diagnosis and treatment by telemedicine D. O. Grigorescu, S. Grigorescu
O.3.13. (89)	Telemonitoring for glycaemic control in patients with diabetes A. Pascu, M. Badea, P. Ifteni, M. Moga
O.3.14. (90)	Image guided-drug delivery and nanotheranostics M. Neagu, C. Constantin, A. Lupu, G. Dumitrascu, S. Zurac, D. Boda
O.3.15. (91)	Out of hour palliative care consult service for patients in Brasov County D. Mosoiu, M. Pop, R. Horeica
O.3.16. (92)	The use of digital simulating devices for the improvement of the 'learning curve' of laparoscopic surgery A. S.Mironescu, L. I.Muntean, L. Vida, M. Moga, C. Arvatescu
O.3.17. (93)	Side effects of using advanced information technologies in healthcare I. Moasil, L. Rogozea
O.3.18. (94)	Telecardiology in heart failure D. Tint
O.3.19. (95)	Medically assisted human reproduction with third party donor - a medical and legal approach I. Nicolae

O.3.20. (96)	Spectroscopic analysis of surgical smoke produced in vitro by laser vaporization of animal tissues in a closed gaseous environment M. Petrus, A. M. Bratu, C. Popa, M. Patachia, C. Matei, S. Banita, and D. C. Dumitras
O.3.21. (97)	Judicial biodetection – E-solutions D. Gabor, A.M. Cornelia, N. Roman, L. Rogozea, A. Repanovici
O.3.22. (98)	Fusion information for behaviours analysis D. Simian, D.R. Fabian
O.3.23. (99)	Experience of implementing telemedicine in professional communication and of simulation in postgraduate education in perinatal medicine system in Moldova V. Friptu, A. Curteanu
P.3.1. (100)	Design, modelling and simulation of mems piezoelectric energy harvester for biomedical implants A. Anghelescu, B. Fîrtat, C. Moldovan, S. Dinulescu
P.3.2. (101)	Biosensor based on nanostructured sensitive material for the detection of epinephrine and norepinephrine I.M. Apetrei, C. Apetrei, D. Tutunaru
P.3.3. (102)	The role of telemedicine in the diagnosis and monitoring of patients with periodontitis V. Badea, M. Grigorian, D.P. Balaban, A.R. Pavalache, A. Caraiane
P.3.4. (103)	Preliminary study concerning salivary nickel and chromium levels in patients with metal restorations D.P. Balaban, A. Caraiane, C. Dina, M. Ion, M. Dinisov, V. Badea, M. Grigorian, F. Busuricu, A. Popescu
P.3.5. (104)	Respiratory allergens - experimental detection, knowledge and prevalence M. Simon, M. Moga, M. Buzescu, M. Badea
P.3.6. (105)	Role of telemedicine in scarlet fever prophylaxis M.E. Cocuz, I.G. Cocuz
P.3.7. (106)	Signalling molecules profiles in caveolin-1 transgenic mice E. Codrici, I D. Popescu, S. Mihai, R. Albulescu, C. Tanase
P.3.8. (107)	Influence of environmental factors on the transmission of the H. pylori infection M.E. Constantinescu, C. Constantinescu
P.3.9.	The main types of birth defects of the lip and psychosocial

(108)	impact E. D m aru, I. Bordeianu , C. Nicolae, C. Pu ca u, D.P. Balaban, A. Caraiane
P.3.10. (109)	Telemedicine: applications in clinical pharmacology, impact on treatment adherence L. Dima, L. Rogozea, M. Moga, M. Badea
P.3.11. (110)	Changes in structure and function of glutathione S-transferase by glycation J. Dršata, I. Boušová, L. Trnková, L. Srbová, Z. Pruchová
P.3.12. (111)	Detection of sulphur compounds using their electrochemical properties C. Faraian, L. Chelmea, N. Dragomir, M. Moga, Gh. Coman, M. Badea
P.3.13. (112)	Teleradiology contribution in staging and monitoring of lung tumours A. Fleancu, G. Sechel
P.3.14. (113)	Risk assessment in intrahospital patients transportation R. Szuhaneck, A. Pana, M. Moga, L. Floroian
P.3.15. (114)	Pregnancy associated oxidative stress - rural/urban area differences L. Gaman, L. Daniela, M. Gilca, A. Valeriu, I. Stoian
P.3.16. (116)	Telemedicine: a way for psychological interventions to the medical staff with the burn-out syndrome? S. Grigorescu, D. O. Grigorescu
P.3.17. (117)	Telemedicine by using spirometry - an useful tool for exploration of the respiratory system M. Grigorian, V. Badea, D.P. Balaban, F.C. Badea, A. Caraiane
P.3.18. (118)	Salivary biomarkers for clinical application E. Lazar, A. Nicolau, D.P.Balaban, M. Moga, M. Badea
P.3.19. (119)	Synthetic phtalocyanines for experimental photodynamic therapy of dysplastic keratinocytes - a proteomic evaluation of apoptosis C. Constantin, C. Matei, M. Tampa, R-M Ion, M. Neagu
P.3.20 (120)	Study regarding oral dental impairment in patients with diabetes in Constanta County E.E. Sachir, D. Catrinioiu, M. Grigorian, V. Badea
P.3.21. (121)	Natural alimentation and constipation F. Sav, B. Popovici, M. Badea



P.3.22. (122)	The contribution of teleradiology and imagistic methods in the evaluation of dimensional and structural changes of the spleen G. Sechel, A. Fleancu
P.3.23. (123)	Research on the benefits of sea buckthorn products T. Seculin, M. Buzescu, M. Badea
P.3.24. (124)	Mini-incubator for cell culture growth I. Stan, C.Moldovan, N.Codreanu
P.3.25 (125)	Vascular calcification in chronic kidney disease - proteomic challenges S. Mihai, E. Codrici, I.D. Popescu, C. Tanase, R. Albulescu, A. Nita, E. Rusu, M. Voiculescu
P.3.26. (126)	Antioxidant action of catalase M. Farraj, N. Taus, A. Mironescu, R. Necula, C. I. Rautia, L. Taus, M. Boicu, V. Necula
P.3.27. (127)	Electroanalytical detection of lidocaine N. Taus, M. Badea, A. D. Hirceaga, R. Necula, C. I. Rautia, L. Taus, M. Boicu, V. Necula
P.3.28. (128)	Interferences on simultaneous electrochemical detection of dopamine, serotonin and ascorbic acid S. Chiperea, S. Brescan, V. Veregut, J.L. Marty, P. Restani, M. Badea
P.3.29. (129)	Analysis of clinical state and basic biochemical parameters in amyotrophic lateral sclerosis patients with normal and enteral nutrition B. Chełstowska, M. Ku ma-Kozakiewicz, A. Bara czyk-Ku ma
P.3.30. (130)	The importance of cyclic citrullinated peptide antibodies and rheumatoid factor in rheumatoid arthritis E Cical , A Vâlceanu, Gh. Coman
P.3.31. (131)	Probiotics in medicine and possible electrochemical detection B. Popescu, B. Popovici, M. Mitrica, L. Neica, G. Silva Nunes, M. Moga, V. Veregut, M. Badea
P.3.32. (132)	Challenges of using telediagnosis from the point of view of Romanian and Italian students M. Badea, P. Restani, S. Girotti, M. Moga, L. Rogozea
P.3.33. (133)	Errors and interferences in urine analysis A.Stanciu, L. Rogozea, L. Floroian, L.Dima, A.Pana, M. Badea

#### **4. New Trends in Biomedical Engineering Sciences**

<b>Code</b>	<b>Lecture (or poster) title - Authors</b>
PL.4.1. (134)	A true theranostic approach to medicine: Towards tandem sensor detection and removal of endotoxin in blood M. Thompson
PL.4.2. (135)	Characterisation of functionalised nanoparticles F.D. Munteanu
K.4.1. (136)	Wireless Technologies and Virtual Instrumentation in “sensing - monitoring - telemedicine” D.Ursutiu, M.Moga, C.Samoila, C.Ravariu
K.4.2. (137)	Methodology of correlative evaluation and rehabilitation of persons with cerebrovascular accident (CVA) M. Baritz, D. Cotoros, D. Barbu
O.4.1. (138)	Doplets generation system modelling for drug delivery applications B. Fîrtat, C. Moldovan, P. Schiopu
O.4.2. (139)	Freescalce TWR-K53 platform for cardiac rhythm monitoring R Maldarus, S.A. Moraru, A Apostu, R. Demeter
O.4.3. (140)	Wireless sensor network for medical monitoring of persons at risk P. Szakacs-Simon, S.A. Moraru, D. Kristaly
O.4.4. (141)	LiveRescue, an Android application to enable volunteers to react faster to medical emergencies A. Bârsan, S. Nica, B. Brînzoiu, I. Szén, L. Sangerozan
O.4.5. (142)	Online software tool for medical instruments recognition by the medical student L. Sangeorzan, C. Nitescu, E. Dinu, L. Rogozea
O.4.6. (143)	Analysis of the mobility and manipulation degree after exposure to controlled vibrations in the human body M. Baritz, D. Cotoros, I. Balcu
O.4.7. (144)	Electronic circuits dedicated for new platforms in electrophysiology - new topics for Solid State Circuits C. Ravariu, D. Ursutiu, F. Babarada, C. Ionescu-Tirgoviste, A. Janel, S. Arama, C. Samoila
P.4.1. (145)	Computational method for estimating the threshold cycle in RT-PCR for pathogen detection

*New Trends on Sensing- Monitoring- Telediagnosis for Life Sciences,  
Brasov, Romania - July 24-26, 2014*

	I. Stanciu, C. Moldovan, G.Dingemans, G. Simons, R. Waber
P.4.2. (146)	Polymers in drug delivery L. Floroian, N.C. Zoita, D. Floroian, C. Samoila
P.4.3. (147)	The role of immunochemical assays during criminal investigations involving the use of TNT F.S. Romolo, S. Girotti, E. Ferri, A. Montoya, M.D'Elia, L.Ripani, G. Peluso, R. Risoluti, E. Maiolini
P.4.4. (148)	Application of virtual instrumentation in X-ray and gamma-ray spectroscopy. A cost-effective virtual list-mode multi-parameter multichannel analyzer N.C. Zoita, L. Floroian
P.4.5. (149)	Modelling lipophilicity of catecholamines using a new QSAR approach I. A. Sima, R. D. Na cu-Briciu, M. V. Diudea
P.4.6. (150)	Bioactive and antimicrobial nanostructured layers for coating of implants L. Floroian, M. Badea, D. Floroian, C. Samoila
P.4.7. (151)	Artificial intelligence technology in health informatics A.B M. Salem

*New Trends on Sensing- Monitoring- Telediagnosis for Life Sciences,  
Brasov, Romania - July 24-26, 2014*

# **New Sensors for Food Control and Forestry**

**PL.1.1.**

**BIOASSAY AND ELECTROCHEMICAL BIOSENSORS  
FOR THE DETERMINATION OF THE ANTIOXIDANT  
CAPACITIES: POTENTIAL APPLICATIONS**

**G. Catanante, C. Calas-Blanchard, J.L. Marty\***

*IMAGES EA 4218, Bât. S, University of Perpignan, Perpignan, France  
jlmarty@univ-perp.fr*

Reactive oxygen species (ROS), naturally generated during the metabolism, can damage biological structures such as proteins, lipids or DNA. Inside the human body, the antioxidant defensive system prevents their effect but sometimes these natural defences are overwhelmed by an excessive generation of ROS and a situation of oxidative stress occurs. Fruit and vegetable have received particular attention because they contain high amounts of antioxidants, known to prevent several illnesses such as cardiovascular diseases and cancer. So, an antioxidant supplemented and healthy diet can prevent and delay diseases.

Several methods have been proposed for the detection of antioxidants. Although photometric, fluorimetric and chromatographic techniques have been widely used, in the last years electrochemical biosensors have become promising tools, since they provide the advantage of rather simple equipment and operation protocols. In our group, we have developed bio-assays and biosensors for the measurement of antioxidant capacity using various strategies. In the framework of the ELENA project, the main objective is the encapsulation of antioxidant compounds for their use as food additives. We have developed a bio-assay and a biosensor for the assessment of the antioxidant capacity based on the superoxide radical scavenging ability. In both cases, the superoxide radicals were generated *in vitro* during the catalytic oxidation of hypoxanthine by xanthine oxidase (XOD). The developed bioassay allows a rapid and reasonably accurate measurement of free and encapsulated antioxidants. Unfortunately, it is still impossible to test coloured samples. So we carried on the design of a biosensor based on H<sub>2</sub>O<sub>2</sub> oxidation, mainly generated by the spontaneous dismutation of O<sub>2</sub><sup>•-</sup>. In presence of antioxidants, some radicals are scavenged, inducing a lower production of H<sub>2</sub>O<sub>2</sub>. Thus, the decrease of the measured current can be correlated to the antioxidant capacity.

**Acknowledgements**

*The authors greatly acknowledge the Programa Operativo de Cooperación Territorial España-Francia-Andorra 2007-2013 (POCTEFA) for financial support through the project "ELENA".*

**PL.1.2.**  
**HPTLC: NEW APPLICATIONS IN THE FIELDS OF  
FOOD AND FOOD SUPPLEMENTS**

**P. Restani<sup>\*</sup>, F. Colombo, G. Frigerio, E. Moro, C. Di Lorenzo**

*Dipartimento di Scienze Farmacologiche e Biomolecolari, Università degli  
Studi di Milano, Italy  
patrizia.restani@unimi.it*

The safety of consumers is guaranteed by the quality control both at the production site and on the market. In the area of food and food supplements, the analytical approach requires special expertise, since the matrix is complex and data obtained could be altered by interferences.

Food supplements, and in particular those products containing botanical preparations, are widely consumed in Western diets and unlike drugs, these products are generally considered by consumers positively, due to the misleading syllogism “natural=safe”.

The popularity and the ease access in shops or via the Internet have speeded up the diffusion of these products, with new concerns about their quality, composition, and safety. The problem is particularly significant, when they are obtained from unregulated markets where illicit activities are not infrequent. On the other hand, the presence of contaminants (mycotoxins, pesticides) is still an open problem and the development of fast and reliable methods is highly recommended. On this basis, new applications of HPTLC method have been developed allowing a fast screening in food/food supplement analysis, even when the matrix shows a particular complexity. Same applications will be illustrated regarding: 1) authentication of a botanical extract; 2) fast screening for contaminants or illicit additions.

**Acknowledgements**

*This research was partially funded by the European Community's Seventh Framework Programme under grant agreement n° 245199. It has been carried out within the PlantLIBRA project (website: <http://www.plantlibra.eu>). This report does not necessarily reflect the Commission's views or its future policy on this area.*

**K.1.1.**  
**PURIFICATION AND PRECONCENTRATION OF  
MYCOTOXINS AND ITS METABOLITES BY  
MOLECULARLY IMPRINTED ADSORBENTS FOR  
BIOMEDICAL ANALYSIS**

**R. Gadzała-Kopciuch, K. Kwa niewska, B. Buszewski\***

*Chair of Environmental Chemistry and Bioanalytics, Faculty of Chemistry,  
Nicolaus Copernicus University, Toru , Poland  
Centre for Modern Interdisciplinary Technologies (BioSep), Nicolaus  
Copernicus University, Toru , Poland  
bbusz@chem.umk.pl*

The metabolism of zearalenone (ZEN) and analytical methods for determining the presence of ZEN and its metabolites were discussed in this study. Similarly to phytoestrogens, solid metaloestrogens, pharmaceuticals and selected pesticides, ZEN is a substance that displays endocrine activity. ZEN is accumulated in living organisms. Zearalenone has a similar structure to estrogen, it has an affinity for estrogen receptors, and it competes with 17 -estradiol for binding the estrogen receptor in natural pathways. A multi-step extraction procedure and highly selective and specific instrumental techniques are required to detect trace levels of this mycotoxins.

In this study presents the results of application of MIP technology for creation of a dedicated system for separation and determination of mycotoxin such as zearalenone and their metabolites in biological samples. Molecular Imprinting Technology is an attractive synthetic approach to mimic natural molecular recognition. Intermolecular forces that develop during polymerization between the template molecule, functional monomer and developing polymer matrix are responsible for creating a polymer microenvironment for the template or imprint molecule. The use of MIPs for SPE and LC is at an early stage and several successful approaches in bioanalysis and environmental analysis are presented.

**Acknowledgements**

*The work was financially supported by the National Science Centre in the frame of the project OPUS No. 153119 (2011/01/B/ST4/00543).*

**K.1.2.**  
**CHALLENGES IN THE DEVELOPMENT OF  
BIOSENSORS FOR FOOD ALLERGENS: EXAMPLE  
OF GLIADIN**

**A. Vasilescu\* , I. Mihai, A. Vezeanu**

*International Centre of Biodynamics, Bucharest, Romania  
avasilescu@biodyn.ro*

Biosensors are being increasingly developed as alternatives to current ELISA, chromatographic or PCR procedures for the detection of allergen protein. Despite the huge interest in developing new methods for gluten (sustained by the big market of gluten-free products), only a few biosensors have been developed so far for this allergen.

Here we report the development of an optical biosensor for gliadin (gluten) based on detection by Surface Plasmon Resonance (SPR). The method relies on a competitive test and uses gliadin-coated SPR interfaces and an anti-gliadin antibody as specific biorecognition element, supplied in solution in a mixture with the sample.

The sensor is characterised by a linear range of 100-400 ng/mL and the time required for one analysis is in 15 minutes. Challenges related to non-specific adsorption, sensor stability and recovery from real samples (flour extracts) are hereby discussed. Analysis of flour extracts with the sensor was compared to results obtained by ELISA. The sensor is useful as a screening tool for products with low content of gluten (20-100 ppm).

**Acknowledgements**

*This work was supported by a grant of the Romanian National Authority for Scientific Research, CNDI – UEFISCDI, project number PN-II-RU-TE-2011-3-0302.*



**O.1.1.  
DISPOSABLE NANOCERIA BASED  
ELECTROCHEMICAL SENSOR FOR THE  
DETECTION OF PHENOLIC WINE ANTIOXIDANTS**

**V. Andrei<sup>1</sup>, E Sharpe<sup>2</sup>, S. Andreescu<sup>2</sup>, A. Vasilescu<sup>1\*</sup>**

<sup>1</sup>*International Centre of Biodynamics*

<sup>2</sup>*Clarkson University, Department of Chemistry and Biomolecular Science,  
Potsdam, NY 13699-5810  
avasilescu@biodyn.ro*

Nanoparticles are increasingly used in antioxidant assays based on various detection modes. A recent, particularly successful example is the NANOCERAC sensor, an optical, paper-based assay exploiting the redox properties of ceria nanoparticles (CeNP). Here we propose an electrochemical alternative to Nanocerac, a disposable sensor that can be used also in highly colored solutions, as illustrated by the assessment of antioxidant capacity of wines. The proposed sensor relies on carbon screen printed (SPE) electrodes with immobilized CeNPS. Detection of several phenolic and non-phenolic antioxidants relevant for wines was achieved by amperometry at -0.1V vs. Ag /AgCl. Calibration curves for gallic acid, caffeic acid, quercetin and ascorbic acid emphasized detection limits of 1.2, 1.8, 1.2 and 1.0 mg./L, respectively. The sensor was used for the evaluation of the antioxidant capacity of 5 red wines from Valea Calugareasca vineyard. The sensor response, expressed as gallic acid equivalents (GAE) was 593-862 mg/L GAE for the five red wines was compared with classical methods for the content of total antioxidants (TEAC) and total polyphenols (Folin-Ciocalteu). Differences between wine samples captured with the ceria-modified electrodes indicate the possibility to include the proposed sensors in future e-tongue devices for wine classification.

**Acknowledgements**

*This work was supported by a grant of the Romanian National Authority for Scientific Research, CNDI – UEFISCDI, project number PN-II-PT-PCCA-2011-3.1-1809.*

### **O.1.2.**

## **TOTAL ANTIOXIDANT CAPACITY ASSAYS -TOOLS TO PREDICT HEATING ASSOCIATED OXIDATIVE MODIFICATIONS OF VEGETABLE OILS**

**I. Stoian<sup>1,2\*</sup>, L. Iosif<sup>1,2</sup>, D. Prundurelu<sup>1</sup>, L. Gaman<sup>2</sup>, M. Gilca<sup>2</sup>,  
V. Atanasiu<sup>2</sup>**

*<sup>1</sup>R&D Irist Labmed, Bucharest, Romania*

*<sup>2</sup>Biochemistry Department, University of Medicine and Pharmacy Carol  
Davila, Bucharest, Romania  
irina\_stoian64@yahoo.com*

Heating associated oxidative modifications of vegetable oils is a health concern because can lead to potential toxic compounds. Vegetable oils are protected against oxidative alterations by different compounds as polyphenols, flavonoids, and antioxidant vitamins. Several total antioxidant assays have been developed to characterise the synergic actions of antioxidants.

The aim of our study was to evaluate different total antioxidant assays in relation with parameters used to characterise oxidative modifications of vegetable oils.

Trolox Equivalent antioxidant assay (TEAC)- ABTS decolorisation assay, DPPH scavenging assay, Ferric reducing antioxidant power assay (FRAP), CUPRAC, beta-catotene linoleic acid assay, superoxide radical scavenging activity and .metal chelating activity were used to evaluate total antioxidant activity of vegetable oils before and after microwave heating.

Total polyphenols, total flavonoids and vitamin E content were also evaluated in relation with microwave heating. Oxidative modifications of vegetable oils have been assessed as thiobarbituric reactive substances (TBARS) and conjugated diens concentrations

### **O.1.3.**

## **MONITORING THE TOTAL ANTIOXIDANT CAPACITY AS A TOOL IN CONTROLLING THE WINE-MAKING PROCESS. CHARACTERIZATION BY ELECTROCHEMICAL AND SPECTROPHOTOMETRIC METHODS**

**V. Andrei<sup>1</sup>, A. Tudorache<sup>2</sup>, E. Brinduse<sup>2</sup>, A. Vasilescu<sup>1\*</sup>**

<sup>1</sup>*International Centre of Biodynamics, Bucharest, Romania*

<sup>2</sup>*ICDVV Valea Calugareasca, Prahova, Romania*

*avasilescu@biodyn.ro*

Production of antioxidant-rich, high quality red wines is conditioned by the monitoring of the total antioxidant capacity (TAC) during the technological process. In this study we report the development of six technological variants for two red wines from Valea Calugareasca vineyard with high antioxidant activity- Negru Aromat and Feteasca Neagra, namely: maceration-fermentation in the presence of enzymes, with addition of tannin, by liquid fraction mounting, delestage, partial running-off of the juice and classical maceration.

Evaluation of the TAC and total polyphenols (TP) in the wines was based on electrochemical and spectrophotometric methods, respectively Square Wave Voltammety on glassy carbon electrodes, TAC by TEAC assay and TP by Folin-Ciocalteu. Assessment of wine characteristics was performed at critical moments: phenolic maturity of grapes at the time of harvest, maceration-fermentation, malolactic fermentation and prior to bottling.

The TAC for Negru Aromat increased during the alcoholic fermentation from 12 to 28 mM TEAC. Both TP and TAC were highest immediately after the alcoholic fermentation (e.g: TAC up to 32 mM TEAC for Negru Aromat and 17 mM TEAC for Feteasca Neagra, respectively), then decreased following malolactic fermentation. Further studies will be conducted for evaluating the TAC during ageing.

### **Acknowledgements**

*This work was supported by a grant of the Romanian National Authority for Scientific Research, CNDI – UEFISCDI, project number PN-II-PT-PCCA-2011-3.1-1809.*

#### **O.1.4.**

### **STUDIES REGARDING THE LEVEL OF SOME CONTAMINANTS IN FOOD SUPPLEMENTS**

**G. Garban<sup>1\*</sup>, C. Neniu<sup>1</sup>, A. Negrea<sup>2</sup>, Z. Garban<sup>3</sup>**

<sup>1</sup>*Laboratory of Environment and Nutrition, National Institute of Public  
Health - Branch Timisoara, Timisoara, Romania;*

<sup>2</sup>*Faculty of Industrial Chemistry and Environmental Engineering,  
University Politehnica Timisoara, Timisoara, Romania;*

<sup>3</sup>*Dept. Biochem. Mol. Biol., Fac. Food Prod. Technol., Banat's University of  
Agricultural Sciences and Veterinary Medicine "King Michael I of  
Romania", Timisoara, Romania  
gabriela.garban@gmail.com*

In order to protect public health is essential to keep also the food contaminants at levels which do not cause health concerns. Maximum levels for lead, cadmium, nitrite and nitrate must be as low as reasonably achievable based upon good manufacturing and agricultural practices. In the present paper the determination of the level of some contaminants in food supplements was pursued.

There were determined the concentration of heavy metals (Pb and Cd) and nitrates/nitrites in 14 types of food supplements containing botanical extracts. The obtained values for Pb and Cd were compared with the maximum levels as mentioned in the EU Regulation regarding the admitted metal contaminants in food supplements. As to the values of nitrate/nitrates there were compared with the admitted levels in "Processed cereal-based foods and baby foods for infants and young children" as mentioned in the EU Regulation.

All the obtained values for the above mentioned contaminants in food supplements were below the established maximum levels.

**O.1.5.**  
**DETERMINATION OF AMMONIA AND  
PUTRESCINE IN BEEF EXTRACT POWDER USING  
VOLTAMMETRIC SENSORS**

**I.M. Apetrei<sup>1</sup>, C.V. Popa (Ungureanu)<sup>2</sup>, C. Apetrei<sup>3\*</sup>**

<sup>1</sup>*Faculty of Medicine and Pharmacy, “Dunarea de Jos” University of  
Galati, Romania*

<sup>2</sup>*Faculty of Food Science and Engineering, “Dunarea de Jos” University of  
Galati, Romania*

<sup>3</sup>*Faculty of Sciences and Environment, “Dunarea de Jos” University of  
Galati, Galati, Romania  
apetreic@ugal.ro*

This work describes the sensing properties of sensors based on modified and unmodified carbon paste electrodes and polypyrrole, respectively. The electrochemical responses towards amine compounds including ammonia and putrescine was analyzed and compared. The voltammetric signals are related to redox properties of amine compounds from the solution. Furthermore, the electroactivity of modifiers from sensors is influenced by presence of amine in analysed solutions. The possibility to detect and quantify the amine compounds in beef extract powder was studied. The detection limits are  $1.64 \times 10^{-6}$  M for ammonia and  $4.35 \times 10^{-7}$  M for putrescine. An array of sensors has been constructed using the two types of electrodes. As demonstrated by means of Partial Least squares - Discriminant Analysis, the system is able to classify the samples as a function of concentration of amine compounds contents.

**Acknowledgments**

*This work was supported by a grant of the Romanian National Authority for Scientific Research, CNCS - UEFISCDI, project number PN-II-ID-PCE-2011-3-0255.*

**O.1.6.**  
**CARBOLINE ANALYSIS WITH AN AMPEROMETRIC  
BIOSENSOR BASED ON MONOAMINE OXIDASE  
INHIBITION**

**M. C. Radulescu, B. Bucur, M.P. Bucur, G. L. Radu**

*National Institute of Research and Development for Biological Sciences,  
Centre of Bioanalysis, Bucharest, Romania  
bucurica@yahoo.com*

-carbolines (harmaline, norharmaline, harmaline, etc.) are produced in humans and animal or present in foodstuffs and drugs. Different chromatographic techniques were used for the analysis of these compounds. We have developed a simple and fast amperometric biosensor based on the inhibition of -carbolines on monoamine oxidase type A (MOA). MOA was immobilised in sol-gel matrix on screen-printed electrode surface modified with Prussian blue. Benzylamine was used as a substrate and hydrogen peroxide was quantified electrochemically. The inhibition of enzyme was rapid and reversible and the biosensor was completely regenerated after one measurement in phosphate buffer solution.

**Acknowledgments**

*This work was supported by project PN-II-RU-TE-2011-3-0076 (CNCS-UEFISCDI).*

### **O.1.7.**

## **THIN LAYER CHROMATOGRAPHY COUPLED WITH IMAGE PROCESSING**

**C.S. Cobzac**

*Faculty of Chemistry and Chemical Engineering, Babes Bolyai University,  
Cluj-Napoca, Romania  
codruta.cobzac@yahoo.com*

Thin layer chromatography is an instrumental technique that allows three analytical processes to be performed by a single run - separation, identification and quantification of a sample compounds. The classical plate evaluation is done by photodensitometry.

New digital image processing technique can be used instead photodensitometry. The first step is to capture the image and some rigor should be emphasized. There is different dedicated image processing software for TLC such as: Sorbfil -TLC, ImageDecipher-TLC, Melanie 7 and Just TLC. These programs provide the area, high or volume of the spots. Correlated with analyte concentration these values are used for calibration curve plotting. The equation parameters – slope, intercept and correlation coefficient are of interest. Usually, based on these values, LOD and LOQ can be determined.

The aim of the study was to compare the performances of photodensitometry and image processing using ImageDecipher and Sorbfil soft. Different types of spot visualization, such as visible spots in day light, visible spots in day light after derivatization, fluorescence and fluorescence quenching were studied.

Thin layer chromatography – digital image processing (TLC-DIP) proves to be an analytical technique that can replace the classical slit scan densitometry being more simple, economic and fast and quit similar regarding precision and accuracy. TLC-DIP is a good candidate for telemonitoring with the condition of a minimal sample preparation.

**O.1.8.**  
**NEW SPR-BASED APTASENSOR FOR DETECTION OF  
ALLERGENIC LYSOZYME IN FOOD**

**I. Mihai\* , A. Vasilescu**

*International Centre of Biodynamics, Bucharest, Romania  
imihai@biodyn.ro*

Lysozyme is a natural enzyme capable of hydrolysis the cell walls of Gram positive bacteria. As a well-known antimicrobial protein, in food industry, lysozyme is used as preservative in wine and cheese manufacturing. Besides the positive aspects, lysozyme is considered to be, among others egg proteins, an allergen and could represent a risk to susceptible consumers.

The SPR-based aptasensors have been recently presented as effective tools for lysozyme detection. In this work we report the development of a new method for lysozyme detection in wine. After optimizing all the experimental parameters the resulting sensor was characterized by a detection limit of 2.44 nM, good stability for up to 4 days of repetitive experiments and high selectivity. A simple strategy based on the use of sodium chloride and a nonionic surfactant has been devised for diminishing the interferences due to wine constituents. Studies with spiked samples of white and red wines allowed calculating the recovery factor of the protein higher than 90%. The SPR aptasensor was compared with a standard HPLC method and find to provide better recovery factors, better detection limit and faster response time.

The usefulness of the aptasensor on lysozyme detection in cheese has been also studied.

**Acknowledgments**

*This work was supported by a grant of the Romanian National Authority for Scientific Research, CNDI – UEFISCDI, project PN-II-RU-TE-2011-3-0302.*



**O.1.9.**  
**MINIATURIZED SENSORS FOR PESTICIDES  
DETECTION IN FOOD**

**C. Moldovan<sup>1\*</sup>, R. Iosub<sup>1</sup>, B. Fîrtat<sup>1</sup>, C. Codreanu<sup>1</sup>, L. Drechsel<sup>2</sup>,  
N. Paust<sup>2</sup>, W. Weigel<sup>3</sup>, S. Ivanov-Pankov<sup>3</sup>, I. Stan<sup>4</sup>**

<sup>1</sup>*National Institute for Research and Development in Microtechnologies,  
Bucharest, Romania*

<sup>2</sup>*Institut für Mikro- und Informationstechnik, Freiburg, Germany*

<sup>3</sup>*SCIENION AG, Berlin, Germany*

<sup>4</sup>*Romelgen SRL, Bucharest, Romania  
carmen.moldovan@imt.ro*

A novel small and mobile platform for pesticides detection based on miniaturized sensors to be used in food security monitoring (fruits, vegetables, drinking water, milk, etc) and agriculture farms will be presented. The developed platform is a user friendly tool able to perform measurements in 30 minutes time, to diagnose the pesticide presence, to alert and to record data for monitoring the pesticides presence in food, vegetables and fruits on field.

The sensors allow the detection of organophosphate pesticides up to the lower limit of  $10^{-9}$ M/l.

The platform for pesticides detection contains the following compounds: biosensor, temperature and pH sensors, microfluidic module, heating system, computer interface and data acquisition of the sensors signals.

The pesticides detection is made by the biosensor which is a disposable element of the platform. The microbiosensor uses three miniaturized planar electrodes, fabricated by standard micro-technology processes like thin film metal deposition, silicon dioxide deposition, micro or nanolithography and clean room facilities. The temperature of the biosensor and liquids will be constantly kept at 37<sup>0</sup>C. The temperature and pH sensors will monitor the fluids and the chemical reactions into the reaction chamber. The chemistry of deposited enzymatic layer, the immobilization technique for AChE, the fabrication technique and the electrical characteristics of the enzymatic sensor will be presented.

**Acknowledgements**

*The research work has been supported by the project “PESTIPLAT”,  
Integrated Platform for Pesticides Detection, MNT-ERANET, 2011-2014.*

**O.1.10**  
**CHALLENGES IN THE DEVELOPMENT OF AN  
ELECTROCHEMICAL APTASENSOR FOR  
LYSOZYME DETECTION IN WINE**

**A. Vezeanu, A. Vasilescu\***

*International Centre of Biodynamics, Bucharest, Romania  
avasilescu@biodyn.ro*

Lysozyme is allowed for use in winemaking in the European countries because it controls the lactic acid bacteria thus providing high quality wines. It was confirmed that the wines treated with lysozyme may trigger allergic responses. Therefore lysozyme is considered as a sensitizer and must be quantified. Although there are many electrochemical aptasensors to detect allergen proteins in food matrix, there are few reported studies on lysozyme detection in real samples, especially in wine matrix. For that reason, our research group developed an aptasensor for lysozyme detection in wines. Two different strategies, were employed for surface functionalization, where the gold electrodes were modified with either i) a self-assembled monolayer of a carboxyl ended thiol and ii) with graphene oxide, that presents a large active surface which allows a significant quantity of aptamer to be immobilized. Moreover, two electrochemical methods were tested: a) faradaic electrochemical impedance spectroscopy (EIS) sthat allows label-free monitoring of analyte-ligand interactions by using the redox couple ferricyanide/ferrocyanide, and b) differential pulse voltammetry (DPV) having as mediator hexamine-ruthenium. A significant problem was the interaction of lysozyme with the wine constituents. The results obtained by EIS and DPV were compared. The aptasensor response recorded by EIS was linear in the range 1-10  $\mu\text{g/mL}$  vs. 0.2 - 1  $\mu\text{g/mL}$  in the case of detection by DPV.

**Acknowledgements**

*This work was supported by a grant of the Romanian National Authority for Scientific Research, CNDI – UEFISCDI, project number PN-II-RU-TE-2011-3-0302.*

**O.1.11.**  
**APTASENSORS FOR FOOD CONTROL.**  
**(ELECTRO)CHEMICAL IMMOBILIZATION AND**  
**MEASUREMENTS**

**G. Istamboulié\*, N. Paniel, L. Barthelmebs, and T. Noguer**

*Université de Perpignan Via Domitia, IMAGES EA4218, Perpignan,  
France  
gistamboulie@yahoo.fr*

Current methodologies for detection of food contamination based on heavy analytical tools cannot guarantee a safe and stable food supply. The reasons are the complexity, the long time-to-result (2-3 days) and the cost of these tools, which limit the number of samples that can be practically analyzed at food processing and storage sites. The need for screening tools that will be still reliable but simple, fast, low-cost, sensitive and portable for in-situ application is thus urgent.

Several aptameric sequences have been described or in development for selective detection of food toxins (eg. Ochratoxin A, aflatoxin B1 &M1, antibiotics, heavy metals) as well as for food quality (eg. Lactose, metallic ions,...). Generally, these aptamers are designed and produced by SELEX Method “Systematic Evolution of Ligands by Exponential Enrichment” and incorporated in affinity columns or in biosensors.

This work presents the development of Aptamers-based sensors using soft and fast immobilization methods combined with highly sensitive detection for several targets in food matrices (oil, milk and nuts). Their selectivity and cross-reactivity were investigated.



**Acknowledgement**

*This work is supported by the European Project: Micro-ring resonator-based biophotonic system for food analysis (BIOFOS, FP7-ICT-Collaborative Project STREP no.611528).*

**O.1.12**  
**INTEGRATED BIOSENSORS USING ACTIVE  
ELECTRONIC DEVICES**

**C. Ravariu<sup>1\*</sup>, M. Gherasim<sup>1</sup>, A. Glavan<sup>1</sup>, B. Robu<sup>1</sup>, M. Badea<sup>2</sup>,  
M. Chitu<sup>1</sup>**

<sup>1</sup>*Faculty of Electronics Telecommunications and Information Technology,  
BioNEC Group, "Politehnica" University of Bucharest, Bucharest, Romania*

<sup>2</sup>*Faculty of Medicine, "Transilvania" University of Brasov, Brasov,  
Romania*

*cristian.ravariu@upb.ro*

The nowadays biosensors integrate in the same chip the biological receptors (enzymes, antibodies) with an active device as transducer. Therefore, the biomaterials coupling to semiconductor devices are considered a first priority in bioscience, permitting to integrate in a minimum area an entire electrochemical and transducer chain. The effects are: minimal invasive medical tests, minimum quantity of wastes, reduced costs and availability of these biodevices for personalized home-care.

Recently, some glucose biosensor based on glucose oxidase (GOX) receptor entrapped on self-assembling of multiwall carbon nanotubes or nanostructured TiO<sub>2</sub>, was reported. For antibody immobilization, the literature recommends the graphene or Si-porous as intermediate layer. We designed and manufactured a Bio-FET transistor with the GOX enzyme immobilized on TiO<sub>2</sub>-nanotubes.

**P.1.1.**  
**THE ELECTROCATALYTIC OXIDATION OF  
PEROXYNITRITE AT A MODIFIED CO(II)  
PHTHALOCYANINE GLASSY CARBON ELECTRODE**

**I.S. Hosu, M. Badea - Doni\***

*National Institute for R & D in Chemistry & Petrochemistry -  
ICECHIM, Bucharest, Romania  
m\_badea@yahoo.it; ioana.shosu@yahoo.com*

Metallophthalocyanine (MPc) are widely used in the electrochemical detection of many substances due to the electroactive metals (e.g. CoPc, FePc) or even due to ring-based processes (e.g. NiPc, ZnPc). Herein, we describe a Co(II) phthalocyanine modified glassy carbon electrode (CoPc/GCE), that exhibits electrocatalytic effect for the oxidation of peroxyxynitrite (PON). PON may act as a prooxidant in muscle foods and the oxidation processes change the colour of the meat from red to brown, which is associated with a loss of freshness and flavour. In the past, this biomolecule, was reported to exhibit an electrooxidation process over a bare GCE or a modified GCE, at high potentials. In this work, we report the electrocatalytic oxidation of PON at 0.15 V on CoPc/GCE vs Ag/AgCl (3 M KCl) and a Pt wire (as counter electrode). Moreover, is recorded a remarkable selectivity against different interfering species (e.g. hydrogen peroxide, nitrite, nitrate, ascorbic acid) that may exist in fresh meat samples. Results with CoPc incorporated in graphene sheets are presented too, as a preliminary work.

***Acknowledgment***

*The authors are grateful for the financial support from the project PN-II-ID-PCE-2011-3-1076, contract no. 184/2011.*

**P.1.2.**  
**BIOSENSING PLATFORM BASED ON AOT-  
STABILIZED PRUSSIAN BLUE,  
A NON-CONDUCTING COPOLYMER AND OXIDASE  
ENZYMES FOR FOOD ANALYSIS BY FLOW  
INJECTION ANALYSIS**

**M. Badea-Doni<sup>1\*</sup>, E. Ocnaru<sup>1</sup>, M.-L. Jecu<sup>1</sup>, G. Vasilescu<sup>1</sup>,  
A.F. Danet<sup>2</sup>**

<sup>1</sup>*National Institute for R&D in Chemistry & Petrochemistry - ICECHIM,  
Bucharest, Romania.*

<sup>2</sup>*University of Bucharest, Faculty of Chemistry, Bucharest, Romania  
m\_badea@yahoo.it*

A robust biosensing platform based on Prussian Blue (PB) stabilized with the anionic surfactant AOT and oxidase enzymes was developed for use in flow injection analysis (FIA) systems. The PB film was formed onto screen-printed carbon electrodes (SPCEs) by potentiostatic deposition. The enzyme (e.g. glucose oxidase - GOD) was immobilized during the electropolymerisation of a non-conducting copolymer based on 2,6-DHN (2,6-dihydroxynaphtalene) and APEA (2-(4-aminophenyl)-ethylamine). For a better immobilization of the enzyme in the electropolymerisation mixture was used glutaraldehyde (Glu). This procedure allows not only the GOD entrapment in the film net, but also the covalent immobilization of the enzyme to the free amino-groups of the polymer via Glu. The SPCE/PB/copolymer/GOD biosensor demonstrates an improved stability in FIA conditions and excellent interference rejection properties. The GOD biosensor inserted in a simple FIA system showed a linear response in the range 0.08 mM - 3 mM glucose, with LOD of 0.05 mM. Similarly, other oxidases used in food analysis like aminoacid oxidase, lactate oxidase, etc may be immobilized to form a selective and robust sensing platform.

**Acknowledgments:**

*The authors are grateful for the financial support from the project PN 09.09.01.06.*

**P.1.3.  
LASER PHOTOACOUSTIC SPECTROSCOPY FOR  
QUALITY EVALUATION OF FRUITS AND  
VEGETABLES**

**A. M. Bratu<sup>\*</sup>, C. Popa, S. Banita, M. Patachia, C. Matei, M. Petrus,  
D. C. Dumitras**

*National Institute for Laser, Plasma and Radiation Physics, Bucharest,  
Romania  
ana.magureanu@inflpr.ro*

Eating fruits and vegetables has always been associated with a healthy diet that can provide essential vitamins and minerals, fiber, and other substances and may reduce the risk of cancer and other chronic diseases. The consumption of fruit and vegetables increased significantly but still the guaranteed quality and safety are critical factors for pre- and postharvest life of fruits and vegetables. Fermentation processes, oxidative stress and pathogen attack can be investigated by measuring the level of ethylene and ethanol using laser photoacoustic spectroscopy (LPAS).

LPAS consists of a line-tunable CO<sub>2</sub> laser which emits radiation in the 9-11 μm infrared wavelength region and a photoacoustic cell, through which the laser light is directed for detecting the gas of interest. The laser based detector is able to distinguish between different gases based on their wavelength dependent “fingerprint” absorption allowing the detection of ethylene and ethanol with very high sensitivity. The instrument is a powerful tool for the early detection of traces released during developmental stages and postharvest storage.

Using this method we were able to observe an increase in ethylene emission from nonorganic plants compared with organic ones. Also, an increase in ethylene production is frequently observed during the interaction between a host and a pathogen as an early response of the plant to the perception of a pathogen attack and thus, can be associated with induction of a defence response. Studies were focused on detection of ethanol – the end product of fermentation.

**P.1.4.**  
**SUSTAINABLE DEVELOPMENT BY RECYCLING  
WASTE AS COMPOST**

**I. Manciulea<sup>1</sup>, L. Dumitrescu<sup>1</sup>**

<sup>1</sup> *Research Centre: Renewable Energy Systems and Recycling, Transilvania  
University of Brasov, Brasov, Romania  
lucia.dumitrescu@gmail.com*

Municipal waste is a growing concern in the world through the large quantity produced every year, the environmental problems and the costs of their storage. Composting is a technique frequently used to recycle a large variety of organic by-products, transforming them into fertilisers useful for the soil. Composting represents the biological oxidative decomposition of organic constituents in wastes, under controlled conditions, which allows development of aerobic microorganisms that convert biodegradable organic matter in a final product (compost, CO<sub>2</sub>, H<sub>2</sub>O, mineral ions) stable for storage and application, without adverse environmental effects. Our research established the possibility of recycling, by composting, vegetables waste with sawdust and sewage sludge in order to obtain compost, a biofertilizer with higher nutritive value for plants and grains, and a very good amendment of the physical and chemical properties of soil. The composting process was monitored, by tests performed weekly (pH-values, electrical conductivity, amino acids content, carbohydrates content, enzyme content, FT-IR spectra) and established interesting correlations between the chemical structures of components of wastes and their biodegradation compounds during composting process. Germination index was performed to evaluate compost phytotoxicity and stability. The results confirm that the presence of sawdust and sewage sludge improves the biodegradation process.

**Acknowledgments**

*This paper is supported by the Sectoral Operational Programme Human Re-sources Development (SOP HRD), financed from the European Social Fund and by the Romanian Government under the project number POSDRU/159/1.5/S/134378.*



**P.1.5.**  
**VARIABILITY OF NUTRITIVE MACROELEMENTS  
AND MICROELEMENTS IN SESSILE OAK (QUERCUS  
PETRAEA LIEBL.) LEAVES FROM PIEDMONT  
VL DENI**

**R.E. Enescu, C.C. V c lie, G. Spârchez**

*Dept. of Silviculture, Transilvania University of Bra ov, Bra ov, Romania  
raluk.enescu@yahoo.com*

The most widespread of all indigenous species, sessile oak is the one that reach up to highest altitudes. The aim of this paper is to analyze the variability and total content of the macro and microelements in leaves, respectively soil. Two soil profiles were carried out and leaves from ten sessile oak trees were sampled during three different moments of vegetation season. Eight nutritive elements (N, P, K, Ca, Mg, Fe, Cu, Zn) have been determined both for soil and leaves. A comparative analysis between content of nutritive elements was performed for soil and leaves. Leaf analysis has shown a different seasonal variation of elements due to a different mobility of them.

**Acknowledgement**

*This paper is supported by the Sectoral Operational Programme Human Resources Development (SOP HRD), ID134378 financed from the European Social Fund and by the Romanian Government.*

**P.1.6.  
FOREST CERTIFICATION: VOLUNTARY  
INSTRUMENT FOR PROMOTING SUSTAINABLE  
MANAGEMENT**

**A.F H I li an, M. Marinescu**

*Department of Silviculture, Transilvania University of Bra ov, Bra ov,  
Romania  
aureliu.halalisan@unitbv.ro*

Starting with 1993, forest certification has become an important modality to promote sustainable forest management and an important market instrument, being based on performance standards. Forest certification is complementary to ISO certification, confirming the quality of forest management, providing market incentives, and supporting the sale of forest products resulting from forests managed sustainably, based on a set of principles and criteria. As of May 2014, 184.5 million ha of forests had been certified to Forest Stewardship Council (FSC) standards. In Romania, at the beginning of May 2014, the certified forest area was 2440400 hectares (where of 83563 ha are forests managed by private structures). The aim of this paper is an overview of FSC certification scheme and its environmental, social and economic impacts.

**Acknowledgment**

*This paper is supported by the Sectorial Operational Programme Human Resources Development (SOP HRD), ID134378 financed from the European Social Fund and by the Romanian Government.*

**P.1.7.**

**ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY  
FOR MYCOTOXIN DETECTION**

**A. Scollo<sup>1</sup>, L. Floroian<sup>2</sup>, A. Perini<sup>1</sup>, A. Vasilescu<sup>3</sup>, P. Restani<sup>1</sup>, M. Badea<sup>2</sup>**

*<sup>1</sup>Università degli Studi di Milano, Italy*

*<sup>2</sup>Transilvania University of Brasov, Romania*

*<sup>3</sup>International Center of Biodynamics, Bucharest, Romania*

*lauraf@unitbv.ro*

Electrochemical impedance spectroscopy, as relative new analytical technique, made possible the detection of some active biological compounds as well as contaminants and residues, based on immunochemical interaction that is studied as electrochemical phenomena at surface electrode.

Detection of mycotoxins (aflatoxin B1 and ochratoxin A) were studied and optimized. Linearity range of detection was established in order to apply the method for real samples as plant extracts and plant food supplements.

**Acknowledgements**

*This research was partially funded by the European Community's Seventh Framework Programme under grant agreement n° 245199. It has been carried out within the PlantLIBRA project (website: <http://www.plantlibra.eu>). This report does not necessarily reflect the Commission's views or its future policy on this area.*

**P.1.8.**

**MICROWAVE VERSUS ELECTRICAL OVEN  
HEATING INFLUENCE ON OXIDATIVE STRESS  
PARAMETERS OF DIFFERENT COMMERCIAL  
COOKING OILS**

**L. Iosif<sup>1,2</sup>, D. Prundurelu<sup>1</sup>, L. Gaman<sup>2</sup>, M. Gilca<sup>2</sup>, V. Atanasiu<sup>2</sup>,  
I Stoian<sup>1,2\*</sup>**

<sup>1</sup> *R&D Irist Labmed, Bucharest, Romania*

<sup>2</sup> *Biochemistry Department, University of Medicine and Pharmacy Carol  
Davila, Bucharest, Romania  
irina\_stoian64@yahoo.com*

Vegetable oils, containing unsaturated fatty acids are susceptible to oxidative degradation during cooking processes and the lipid peroxides that appear may have toxic potential on human health. Antioxidants present in vegetable oils can protect and may delay the oxidation process. We have considered of interest to study and compare the variation of total antioxidant capacity in relation to lipid peroxides formation during conventional and microwave oils heating.

Sunflower, corn, soybean, palm and a mixed oil(containing sunflower, grape, flaxseed and rice oil) were purchased from the local supermarket. To simulate conventional times used in home cooking, different exposure times were tested, namely, 5, 10 and 15 min. Trolox Equivalent Antioxidant Capacity (TEAC), lipid peroxides as thiobarbituric reactive substances (TBARS), conjugated dienes and vitamin E as -tocopherol were determined before and after 5, 10 and 15 minutes of heating.

Vitamin E showed a marked tendency for degradation during both types of heating. The degradation was more pronounced for microwave heating then for conventional electrical heating. Total antioxidant capacity showed a remarkably similar behaviour decreasing for both types of heating after 15 minutes. TBARS and conjugated dies were increased after both microwave and electrical heating. Differences in oil composition may explain the differences in resistance to the oxidative processes associated with either microwave or electrical heating.

**P.1.9.**

**ROSMARINUS OFFICINALIS L.- PHYTOCHEMICAL  
AND PHARMACOLOGICAL STUDY**

**D. Hanganu<sup>1</sup>, A. M. rculescu<sup>2</sup>, B. Sevastre<sup>3</sup>, R.F. Brînzan<sup>4</sup>, N.K.Olah<sup>4,5</sup>,  
D. Benedec<sup>1</sup>, O. Raita<sup>6</sup>, A. Popa<sup>6</sup>, D. Toloman<sup>6</sup>, C. Bele<sup>3</sup>, S. Socaci<sup>7</sup>**

*<sup>1</sup> Facultatea de Farmacie, Universitatea de Medicin i Farmacie "Iuliu Haieganu", Cluj-Napoca, România; <sup>2</sup> Facultatea de Alimentatie si Turism, Universitatea Transilvania, Brasov; <sup>3</sup> Facultatea de Medicin Veterinar , Universitatea de tiin e Agricole i Medicin Veterinar , Cluj-Napoca, România; <sup>4</sup> SC PlantExtrakt SRL, R daia, Cluj, România; <sup>5</sup> Facultatea de Medicin , Farmacie i Medicin Dentar , Universitatea de Vest "Vasile Goldi " Arad, Arad, România; <sup>6</sup> Institutul Na ional pentru Cercetarea i Dezvoltarea Tehnologiilor Izotopice i Moleculare ; <sup>7</sup> Departamentul de tiin a i Tehnologia Alimentului, Universitatea de tiin e Agricole i Medicin Veterinar , Cluj-Napoca, România  
handa\_1964@yahoo.com*

The use of fresh vegetal products is the new trend in phytotherapy. This paper presents a phytochemical and pharmacological study on *Rosmarinus officinalis* L. (rosemary) mother tincture, obtained by cold extraction from fresh shoots, according to Eur. Ph. The phytochemical analysis was performed using chromatographic (TLC, GC-MS, HPLC-DAD, HPLC-MS) and spectral methods. The antioxidant potential was evaluated by DPPH, FRAP, EPR methods and silver nanoparticule - based method. The hepatic protectiv activity of tincture (300 mg/kg body weight) was performed on CCl<sub>4</sub> hepatitis rat model (1 ml/kg body weight) by assessing the levels of plasma total protein, albumin, AST, ALT and GGT. Additionally routine hematology was done. The initial screening indicates the borneol, bornyl acetate, rosmarinic acid and luteoline-7-O-glucosyde, a content of 0,27 mg/ml total flavonoids expressed in luteoline and 0,60 mg/ml total polyphenols expressed in rosmarinic acid. By GC-MS analysis was identified 33 terpens, mainly 1,8-cineole (17,82 %), d-limonene (5,64 %) and alpha-pinene (3,57 %). The rosmarinic acid was quantified by HPLC analysis (0,35 mg/ml). It was determined an increased antioxidant effect (IC<sub>50</sub> 32,05 µg/ml). The hepatotoxicity was reflected by the elevated levels of AST, ALT, GGT (p<0,01) and decreasing of albumin and A/G ratio. The tincture administration prevented the rise of serum AST and ALT (p<0,01), increased A/G ratio (p<0,05) and improved the hematological parameters. The phytocomplex of rosemary mother tincture, rich in terpens and polyphenols provide a significant antioxidant and hepatoprotective activity.

**P.1.10.**  
**GENERAL PERCEPTION OF STUDENTS  
CONCERNING THE TOPIC OF MYCOTOXINS**

**A. Huzuna, M. Badea \***

*Faculty of Medicine, Transilvania University of Brasov, Brasov, Romania  
mihaela.badea@unitbv.ro*

Mycotoxins are produced by a number of different fungi, and can be present in different of food (cereal grains, herbals, oil seeds, dried fruits, apple juice, wine and meat products) and animals feed. Because many mycotoxins are highly resistant at high temperature (food processing), they could enter on the food chain and provide a several adverse to human health.

The work contains two parts, trying to indicate the level of knowledge about the topic of mycotoxins in people from Romania and Italy, and also to identify some possible rapid ways for detection of aflatoxins from different matrices.

Students from Faculty of Food and Tourism and Faculty of Medicine from Transilvania University of Brasov, as well as adults with no direct related knowledge with the topic of mycotoxins were asked to provide data about their information related to the field of mycotoxins.

The information concerning the sources of mycotoxins, their health effects, possibility of prevention, sources of information about the topic of mycotoxins were compared for the three groups studied. The differences between the groups were explained taking into account the differences of ages, education and location.

**P.1.11.**  
**COMPARISON OF VOLATILE COMPOUNDS IN  
ROMANIAN MENTHA PIPERITA AND MENTHA  
SPICATA BY HEADSPACE AND  
HYDRODISTILLATION TECHNIQUES**

**I. Mihai<sup>1\*</sup>, M. Buleand<sup>1</sup>, Z. Moldovan<sup>1</sup>, I. G. David<sup>1</sup>, E. Oprea<sup>2</sup>,  
I. Adriana-Badea<sup>1</sup>**

<sup>1</sup> *Department of Analytical Chemistry, Faculty of Chemistry, University of  
Bucharest, Bucharest, Romania*

<sup>2</sup> *Department of Biochemistry, Organic Chemistry and Catalysis, Faculty of  
Chemistry, University of Bucharest, Bucharest, Romania*  
*imihai@biodyn.ro*

It is known since antiquity that the plants play an important role in human life, not only as food elements but also in the health-care. But how did our ancestors know which plant has benefits for human organism and which one is toxic? The answer is “testing”. Nowadays, the word “testing” has a different meaning because of the scientific and technology evolution. Since the interest in returning to natural products has become a real trend, a significant number of analytical methods have been developed to characterize plants or plants extracts.

Mentha species have been widely analyzed due to its important antioxidant capacity, a property of great interest considering the growing impact of the “oxidative stress” on humans health. In this work we report a GC-MS comparative study of qualitative composition of both essential oil and plant itself for two mentha species from Romanian territory. Essential oils, obtained by hydrodistillation were analysed using the liquid injection technique, while the plants were analysed through head-space GC-MS.

All the results were further processed using Principal Component Analysis (PCA) in order to find a specific profile for authenticity assessment.

**P.1.12.**

**CLASSIFICATION AND FINGERPRINTING OF SEA-  
BUCKTHORN (HIPPOPHAE RHAMNOIDES),  
BILBERRY (VACCINIUM MYRTILLUS) AND  
CRANBERRY (VACCINIUM VITIS-IDAEA) DIETARY  
SUPPLEMENTS BY UV-VIS SPECTROSCOPY AND  
MULTIVARIATE EXPLORATORY TECHNIQUES**

**A.M. Sima, C. Sârbu, R.D. Na cu-Briciu**

*Department of Chemistry, Faculty of Chemistry and Chemical Engineering,  
Babe -Bolyai University, Cluj-Napoca, Romania  
rodicab2003@yahoo.com*

Sea-buckthorn, bilberry and cranberry are some of the most appreciated berries for their phyto-pharmaceutical potential. As a consequence they are often used as raw material for dietary supplements that claim to be highly beneficial for human health. During this study a very efficient evaluation of autochthon products has been performed through UV-Vis spectroscopy and multivariate exploratory techniques, such as cluster analysis (CA), principal components analysis (PCA) and linear discriminant analysis (LDA). The experiment was built on a number of six products based on sea-buckthorn, four products based on bilberry and six products based on cranberry. In addition, two of the investigated products present in composition both sea-buckthorn and bilberry, while one was containing both cranberry and bilberry. To increase the relevance of the study, the dietary supplement extracts were compared with extracts of the natural fruits. Before the UV-Vis investigation the dietary supplements were supposed to an extraction procedure through ultrasonication, using ethanol as extraction solvent. The direct, derived and normalized UV-Vis spectra of all extracts were digitized and used in further chemometric analysis. The results obtained by CA, PCA and LDA applied on the obtained spectra are creating a pertinent overview on the quality of sea-buckthorn, bilberry and cranberry dietary supplements existed on Romanian market.

**Acknowledgements**

*This work was possible with the financial support offered by Babes-Bolyai University through research Grant GTC-34071/2013 and by the Romanian Ministry of Education, Research, Youth and Sport through research Grant PN-II-ID-PCE-2011-3-0366.*



**P.1.13**  
**THE IMPACT OF ULTRAVIOLET RADIATION ON  
FUNGAL LOAD OF CERTAIN SPICES, USED IN MEAT  
INDUSTRY**

**V. Necula<sup>1</sup>, M. Babii<sup>2</sup>, M. Boicu<sup>2</sup>, N. Taus<sup>1\*</sup>, A. Macri<sup>3</sup>**

<sup>1</sup> *Faculty of Medicine, Transilvania University of Brasov, Brasov, Romania*

<sup>2</sup> *Sanitary –Veterinary and Food Safety Direction of Brasov, Brasov,  
Romania*

<sup>3</sup> *Faculty of Veterinary Medicine, Cluj Napoca, Romania  
nicoletataus@yahoo.com*

The paper represents a study concerning the contamination of no-heat processed meat products, with fungi from spices used for the preparation.

Compliance with all stages of manufacturing technology, from the hygiene point of view, does not exclude contamination with fungi, using contaminated spices.

A special aspect that the present paper points out is represented by the impact of UV radiations with 253.7 nm upon the contaminated spices that are losing fungal load after one hour exposure.

**P.1.14.  
DETERMINATION OF ANTHOCYANIN PIGMENTS  
IN POTATO USING SPECIFIC CONTACT SENSORS  
AND ANALYTICAL METHODS**

**F. Dam a<sup>1,2\*</sup>, A. Woinaroschy<sup>1</sup>, G. Olteanu<sup>2</sup>**

<sup>1</sup>*Department of Chemical and Biochemical Engineering, "Politehnica"  
University of Bucharest, Bucharest, Romania*

<sup>2</sup>*National Institute of Research and Development for Potato and Sugar  
Beet, Brasov, Romania  
florentina.damsa@potato.ro*

Currently, there is a remarkable global interest to identify antioxidant compounds from plants. In the last decade research activities have focused on anthocyanin from fruits and potato because it is a water-soluble pigment that can be used as food dye in different products, but also on bioactive properties (with implications for human health).

Selection of potato varieties with high content of anthocyanin is a priority. For selecting varieties it is aimed to identify quick and cheap methods used directly in the field during vegetation and in the laboratory.

This paper presents preliminary results on the determination of anthocyanin in potato leaves (Blue Congo and Albastru-Violet de G 1 ne ti varieties) by two different methods. As controls were used Romanian varieties Christian (red peel / white pulp) and Roclas (white peel and pulp). Anthocyanin content was determined in the field using ACM 200 plus (Anthocyanin Content Meter) and in the laboratory using the soaking in 1% acidified methanol.

ACM 200 plus is a instrument designed for the rapid, non-destructive, determination of anthocyanin content in intact leaf samples. The total anthocyanins content in methanol extracts were determined spectrophotometrically by the pH differential method.

**P.1.15.**  
**SOIL RESOURCES AND AGRICULTURAL CROPS  
VEGETATION STATUS MONITORING BY USING  
SPECIFIC AND PRECISION SENSORS**

**I. Puiu<sup>1</sup>, G. Olteanu<sup>1</sup>, A. M. rculescu<sup>2</sup>, A. Ghinea<sup>1</sup>, F. Dam a<sup>1</sup>**

<sup>1</sup> *National Institute of R-D for Potato and Sugar Beet (NIRDPSB), Brasov,  
Romania*

<sup>2</sup> *Faculty of Food and Tourism, Transilvania University, Brasov, Romania  
olgeo@potato.ro*

Increased demands on agricultural production, food security and safety, and environmental quality require improvement of agricultural management. This can be achieved through continuous monitoring and precise production factors (anthropic, biological, edaphic and climatic).

Progress in quality, reliability and diversification of contact and remote sensing sensors for monitoring soil resources and vegetation condition of crops, allow precision management efficiency and environment friendly.

The paper presents results from NIRDPSB Brasov using sensors for:

- monitoring "on the go" of soil resources (physical and chemical quality): Veris 3100 MSP Soil EC-NIR Spectrophotometer, Spectrum SC-900 Soil Compaction Meter, Spectrum TDR-300 Soil Moisture Meter;
- monitoring "on the go" vegetative status (physiological condition and health, water stress and plant nutrition) in crops: CropScan MSR-16R Multispectral Radiometer (400-1500nm), Spectrum CM-1000 NDVI;
- monitoring chemical composition of plants (the amount of chlorophyll and anthocyanin): Spectrum SPAD-502, Opti-Sciences ACM-200 Anthocyanin Content Meter.

All data collected by sensors mentioned are geo-referenced (GPS coordinates) and acquired continuously in a Geographic Information System (GIS) to obtain spatial maps of favourability and risk used in performance management of crops.

**P.1.16.**  
**CLEANING PROCEDURES FOR OCHRATOXIN A  
DETECTION**

**A. Perini<sup>1</sup>, A. Scollo<sup>1</sup>, P. Restani<sup>1</sup>, M. Badea<sup>2\*</sup>**

<sup>1</sup>*Dipartimento di Scienze Farmacologiche e Biomolecolari, Università degli  
Studi di Milano, Italy*

<sup>2</sup>*Faculty of Medicine, Transilvania University of Brasov, Romania  
mihaela.badea@unitbv.ro*

Scientific studies showed that ochratoxin A (OTA) can have several effects such as hepatotoxic, nephrotoxic, neurotoxic, teratogenic and immunotoxic on several species of animals, and can cause kidney and liver tumors in rats and mice. Its toxicity varies depending on the species, the sex and the cellular type of the tested animals.

OTA contamination of many other raw agricultural products has been observed. Contamination occurs in a variety of food and feed, such as pulses, coffee beans, spices, cheese and meat products. OTA has also been detected in other beverages such as beer.

Analytical methods were developed in order to monitor the content of OTA from different matrices. In order to have good performance, cleaning procedures are recommended for their separation using immunoaffinity, MIP-coated columns, aptamers-coated columns.

**Acknowledgements**

*This research was partially funded by the European Community's Seventh Framework Programme under grant agreement n° 245199. It has been carried out within the PlantLIBRA project (website: <http://www.plantlibra.eu>). This report does not necessarily reflect the Commission's views or its future policy on this area.*

**P.1.17.**  
**FOOD ANTIOXIDANTS AND THEIR BENEFITS FOR A  
HEALTHY DIET**

**C. Popa, M. Moga, M. Badea\***

*Faculty of Medicine, Transilvania University of Brasov, Brasov, Romania  
mihaela.badea@unitbv.ro*

The term "antioxidant" refers in general to non-nutrient compounds in foods (polyphenols), which have *antioxidant capacity* in vitro. Dietary antioxidant vitamins (A, C, E) have been proved with antioxidant efficacy *in vivo* studies.

A big number of common foods are good sources of antioxidants. Spices, plants, and essential oils are rich in antioxidant compounds. Deeply pigmented fruits, dried fruits and cooked vegetables contain big amount of antioxidants.

Antioxidants are frequently used in food supplements and have been investigated for the prevention of diseases such as cancer, altitude sickness and coronary heart disease.

**P.1.18**  
**THE INFLUENCE OF THE ALIMENTATION  
PATTERN IN ADOLESCENTS HEALTH IN BRASOV  
REGION**

**B.E. Popovici<sup>\*</sup>, M. Mitrica, A. Cosor**

*Faculty of Medicine, "Transilvania" University Brasov, Brasov, Romania  
biancadr@yahoo.com*

Cardiovascular pathology is nowadays one of the most frequent pathology not only in adulthood but also in childhood, the most affected age is adolescent period. One of the most important causes of this situation is alimentation pattern.

Our study had been made in two high schools from Brasov on a paediatric population (398 subjects) aged between 14 and 18 years, boys and girls, and they had to answer to a questionnaire regarding their alimentary habits (frequency of eating fresh fruits and vegetables, fast-food, sweet drinks) and also habit of playing sports. We had been made measurement of weight, height, blood pressure and calculation of body mass index for all the subjects.

Our results had shown that the "unhealthy" style of life, including weekly or even daily fast-food, consuming of sweet drinks, and sedentary activities for recreation instead of playing sports are present in adolescents and it is correlated with the a abnormal high body mass index for age and gender. These results are alarming because future adult cohort has great chance to develop cardiovascular pathology.

**P.1.19.**

**AFLATOXINS DETECTION USING RAPID TESTS**

**A.Scollo<sup>1</sup>, A. Perini<sup>1</sup>, P. Restani<sup>1</sup>, M. Badea<sup>2\*</sup>**

<sup>1</sup>*Dipartimento di Scienze Farmacologiche e Biomolecolari, Università degli Studi di Milano, Italy*

<sup>2</sup>*Faculty of Medicine, Transilvania University of Brasov, Brasov, Romania  
mihaela.badea@unitbv.ro*

Aflatoxins are poisonous and carcinogenic compounds produced by different species of fungi (*Aspergillus* family), which are found mainly in improperly stored food (humidity, temperature) and animal feeds.

AFB1 is the most frequent of these compounds present in contaminated food samples and AFB2, AFG1 and AFG2 are generally not reported in the absence of AFB1. AFM1 and AFM2 are hydroxylated derivatives of AFB1 and AFB2 that may be found in milk, milk product or meat.

Different rapid tests were compared and used for aflatoxin detection from standard and real samples – extracts of liquorice.

**Acknowledgements**

*This research was partially funded by the European Community's Seventh Framework Programme under grant agreement n° 245199. It has been carried out within the PlantLIBRA project (website: <http://www.plantlibra.eu>). This report does not necessarily reflect the Commission's views or its future policy on this area.*

**P.1.20.**

**NEW APPROACHES FOR THE ASSESSMENT OF  
ANTIOXIDANT ACTIVITY IN FOOD AND FOOD  
SUPPLEMENTS**

**C. Di Lorenzo<sup>\*</sup>, F. Colombo, G. Frigerio, E. Moro, M. Dell'Agli, P.  
Restani**

*Dipartimento di Scienze Farmacologiche e Biomolecolari, Università degli  
Studi di Milano, Milan, Italy  
chiara.dilorenzo@unimi.it*

It is widely accepted that a diet with high intake of fruits, vegetables, and other foods rich in vegetable preparation may reduce the risk of oxidative stress-related diseases, including cardiovascular diseases and cancer. The positive effects of some foods and plants on human health are at least partially associated with their antioxidant activity, which can be due among others to the presence of flavonoids and other polyphenols. Considering the relationship between the amount of antioxidant compounds and the human health, the aim of this study was the application of *in vitro* methods suitable for the evaluation of the antioxidant activity of some food and dietary supplements (e.g. food supplements containing green tea and grape). These methods included both spectrophotometric and chromatographic assays. Spectrophotometric methods, as DPPH (1,1-diphenyl-2-picrylhydrazyl) assay, were useful for a fast measurement of the total antioxidant activity. Chromatographic assays included HPTLC (High Performance Thin Layer Chromatography), a new analytical approach, which allowed a fast screening of antioxidant properties of active compounds present in the sample analyzed. Finally, the antioxidant properties of the samples can be also compared with the relative abundance of active molecules assayed by HPLC (High Performance Liquid Chromatography). The results obtained applying the different analytical approaches are compared and discussed.

**Acknowledgments**

*The research leading to these results has received funding from the European Community's Seventh Framework Program (FP7/2007-2013) under grant agreement n° 245199. It has been carried out within the PlantLIBRA project. This report does not necessarily reflect the Commission's views or its future policy on this area.*



**P.1.21.**

**FOOD ALLERGENS TOPIC PRESENTED IN ONLINE  
MEDIA AND POPULATION KNOWLEDGE**

**M. Ianovici, B. Popovici, M. Moga, M. Badea\***

*Faculty of Medicine, Transilvania University of Brasov, Brasov, Romania  
mihaela.badea@unitbv.ro*

Food allergies are a problem on all ages, with different implications for the healthy status of the population.

In this work, the issue of food allergens was studied by collecting and analyzing articles from online magazines and newspapers with topic related to food allergies and it was also used a questionnaire study in order to establish the level of knowledge about the subject.

Questionnaires were completed by 200 people. The first group was considered a group having medical knowledge (doctors, nurses and students in the final year of the Faculty of Medicine – Transilvania University of Bra ov). The second group analyzed consisted of 100 people who are not medical trained and who know the subject just as patients or not. Data were statistically analyzed compared to highlight differences in the perception of people interviewed.

It was noted that it is important that general practitioners and specialized doctors to work with the media, so that information available to people of different ages to be more relevant, based on scientific evidence. Both groups studied have shown the importance of proper labels of potentially allergenic foods.

We identified also from this study the importance of patient-physician collaboration in order to establish a personalized management system customized to the situation due to a specific food allergy, with a maximum efficiency to that investigated person.

**P.1.22.  
MILK INTOLERANCE OR MILK ALLERGY?**

**R. Diaconu, D. Pal, B. Popovici, M. Mitrica, M. Badea\***

*Faculty of Medicine, Transilvania University of Brasov, Brasov, Romania  
mihaela.badea@unitbv.ro*

Even than the symptoms of milk allergies and lactose intolerance are somewhat similar, lactose intolerance and milk allergies are not the same thing. A milk allergy is caused by malfunctioning immune systems that consider milk proteins as harmful allergens and releases immunoglobulin E (IgE) antibodies into your bloodstream. Gastrointestinal problems occur in lactose intolerance due to the problem of lactose inability to be digested.

In order to avoid further confusion, the work present comparative the causes, symptoms, effects, diagnostics, treatments from the point of view of doctor and a nurse.

**P.1.23.**

**CELIAC DISEASE VS. GLUTEN INTOLERANCE VS.  
WHEAT ALLERGY. MECHANISMS AND DIAGNOSIS**

**V. Dinu, A. Murea, B. Popovici, M. Mitrica, M. Badea\***

*Faculty of Medicine, Transilvania University of Brasov, Brasov, Romania  
mihaela.badea@unitbv.ro*

Celiac disease, an autoimmune disorder of the small intestine, is caused by a reaction to gliadin (from wheat) and to similar proteins found in the as barley and rye.

Gluten intolerance (gluten sensitivity) is a group of disorders including celiac disease in which gluten has an adverse effect on the body.

Sometimes confusions appear between wheat allergy and gluten sensitivity, even than they have different characteristics.

This work underlines the mechanism and diagnosis possibilities, as well as associated prevention- treatment measures.

**P.1.24.  
MYCOTOXINS DETERMINATION BY THIN LAYER  
CHROMATOGRAPHY COUPLED WITH IMAGE  
PROCESSING**

**C.S. Cobzac<sup>1\*</sup>, M. Badea<sup>2</sup>**

<sup>1</sup> *Faculty of Chemistry and Chemical Engineering, Babes Bolyai University,  
Cluj-Napoca, Romania*

<sup>2</sup> *Faculty of Medicine, Transilvania University of Brasov, Brasov, Romania  
codruta.cobzac@yahoo.com*

Mycotoxins are secondary metabolites of fungi which occur in a variety of plant products. They have received considerable attention due to their significance in human health. Among the mycotoxins that are known to cause human diseases, aflatoxins and ochratoxins have been most studied. Thin layer chromatography was employed for simultaneous determination of aflatoxin B<sub>2</sub> (AB<sub>2</sub>) and ochratoxin A (OTA). Thin layer chromatography was carried out on HPTLC Silica gel 60 plates and a ternary mixture consist of Ethyl acetate – Toluene – Formic acid (30:2.5:0.5, v/v/v) was used as mobile phase. The experiments were carried out in the concentration range of 1-17 ng/spot. Plate evaluation was performed both, using classical technique (photodensitometry in fluorescence mode at excitation= 333nm) and modern technique, using image processing. After the plates were photographed in UV light (365nm) the digital image was saved as bmp file and analyzed with two dedicated programs ImageDecipher and Sorbfil. The calibration curves were plotted taking in account the peak area and peak high of the corresponding sp/vots. When photodensitometry was used for evaluation linear equation for calibration curves were obtained ( $r^2 > 0.995$ ). Limit of detection (LOD) was 0.6583 and 0.6767ng/spot for OTA and AB<sub>2</sub>. Quantification limit (LOQ) was 1.297 and 1.314ng/spot for Ota and AB<sub>2</sub>. When image processing was applied second order calibration curves were obtained in all cases.

**Acknowledgments**

*The research leading to these results has received partial funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 245199. It has been carried out within the PlantLIBRA project (website: [www.plantlibra.eu](http://www.plantlibra.eu)). This report does not necessarily reflect the Commission views or its future policy on this area.*



*New Trends on Sensing- Monitoring- Telediagnosis for Life Sciences,  
Brasov, Romania - July 24-26, 2014*

# **Integrative Environmental Sciences**

**PL.2.1.**  
**ENVIRONMENTAL MONITORING OF PESTICIDES  
BY USING BIOANALYTICAL TECHNIQUES**

**G.S. NUNES**

*Núcleo de Análise de Resíduos de Pesticidas, NARP, Universidade Federal  
do Maranhão (UFMA), São Luís, MA, Brazil.  
gilvanda-dapi@hotmail.com*

The developing of biosensor-based methods has paralleled the expansion of immunochemical detection methods to applications in environmental monitoring. Among the most common types of biosensors, we can highlight the amperometric ones, based on acetylcholinesterase enzymes (AChE), which detect the presence of inhibitors of AChEs, such as organophosphorus (OP) and N-methylcarbamate (NMC) insecticides. Moreover, biosensors based on other enzymes such as organophosphorus oxidase and phosphatase, for the detection of OP insecticides, aldehyde dehydrogenase (AIDH), for dithiocarbamate fungicides, glutathion-S-transferase, for atrazine, and peroxidase, to carbamate insecticides have been reported in several studies worldwide. In recent years high-performance immunoaffinity chromatography, which began as a promising separation technique in biochemical and clinical research, has been adapted for separating and quantifying environmental pollutants such as pesticides. Bioaffinity offers a selective biological basis for separation that can be incorporated into a modular analytical process for more efficient environmental analysis. The use of immunoaffinity chromatography for separation complements the use of immunoassay or even chromatographic techniques for pesticide detection and quantification. A widely used analytical technique for environmental analyses is enzyme-linked immunosorbent assay (ELISA), so analysts can also take advantage of several ELISA-based methods as screening tools for pesticide detection before sending positive samples to conventional chromatographic analysis. Environmental methods based on bioaffinity range from mature immunoassays to emerging techniques such as enzyme- or immune-sensors for individual or in group molecules. Flow injection analysis (FIA) has also becoming an important step into analytical process, allowing faster and more reproducible measurements.

## **K.2.1. THE INFLUENCES OF ENDOCRINE DISRUPTORS ON THE EARLY ONSET OF MENOPAUSE**

**M. Moga<sup>\*</sup>, N. Bigiu, A. Plotogea, M. Badea, A. Pascu**

*Transilvania University of Brasov, Romania  
moga.og@gmail.com*

Environmental toxins may lead to disturbances in age of menopause with influences also on health of postmenopausal woman and on the risks associated with menopause. These toxins (named endocrine disrupting factors), have endocrine disruptive effects, acting through several mechanisms disrupting the feedback loops of the hormonal and homeostatic systems.

Age at menopause is determined by a series of factors beginning with the pool of ovarian follicles at birth which may be influenced by in utero exposures, but also age at menarche, weight, use of hormonal supplements, socioeconomic status. Early-life events could affect the number of a woman's oocytes and determine age at menopause. Thus, early life exposure to endocrine disruptors has lifelong effects on neuroendocrine gene expression causing the advancement of reproductive senescence.

The aim of this review was to establish the impact of these endocrine disruptors on the early onset of menopause, emphasizing perinatal and in-utero exposures which influence the size of the initial oocyte cohort and premature ovarian failure.

### **Acknowledgments**

*The research studies presented in this paper were obtained during CEEPUS projects - “Developing a network for monitoring the impact of environmental and nutritional factors on fertility and neonatal health” (CIII-RO-0313-05-1314) and “Education in separation and identification of organic xenobiotics in environmental samples and food product” ( CII-PL-0004-07-1112).*



**O.2.1.**  
**SALIVARY COTININE AND PASSIVE SMOKING IN  
ADULTS**

**C. Nuca<sup>\*</sup>, D.P. Balaban, V. Badea, A. Caraiane**

*Faculty of Dentistry, Ovidius University, Constanta, Romania  
medcris@yahoo.com*

A precise estimation of tobacco smoke exposure is an important concern for the epidemiologic studies regarding environmental pollution. Assessment of passive exposure to tobacco smoke is even more problematic as self-reporting of the smoking habits is not an accurate measurement of this parameter. In this context, the optimal sensing of passive smoking is the analysis of cotinine in the human body fluids.

In the present cross-sectional study we used questionnaires for initial classification of subjects in smokers/non-smokers and the salivary cotinine levels measured by NicAlert™ Saliva Tests for objectively evaluation of the passive smoking prevalence in non-smokers.

The results showed that only approximately 1/3 of the subjects that were reported as non-smokers in the initial classification was not exposed to tobacco smoke (level 0 of salivary cotinine) in the last few days, while more than 2/3 had a salivary cotinine level that reflects an important passive tobacco smoke exposure.

Because smoking is at present the principal avoidable cause of premature death in the whole world, involved in the aetiology of numerous systemic diseases, future studies regarding objective sensing and (tele)monitoring of the environmental pollution with tobacco smoke are needed for increasing the quality and length of the people live.

## **O.2.2. MONITORING SYSTEM OF AIR QUALITY**

**A. Voina<sup>1\*</sup>, G. Alecu<sup>1</sup>, C. Ravariu<sup>2</sup>, C. Voina<sup>3</sup>**

<sup>1</sup> *National Institute for Research and Development in Electrical  
Engineering ICPE-CA, Bucharest, Romania*

<sup>2</sup> *Politehnica University of Bucharest*

<sup>3</sup> *SC ICPE ACTEL SA  
andreea.voina@icpe-ca.ro*

Prevention and monitoring of air pollution are issues of public, national and international interest. Much of the current environmental issues can be controlled or reduced through the development of monitoring programs based on the best scientific and technical solutions for measuring and quantifying the specific environmental indicators.

Taking into account that air pollution is one of the most debated issues in the world, in this paper is proposed a solution for the development of a system for data acquisition and monitoring of air quality and appropriate software application. The proposed software application allows reading, acquisition and monitoring of analog signals, voltages and currents (unified signals 0 ... 10V, 4 ... 20mA) to analyze the concentrations of main air pollutants, the program enabling and optical and acoustic signalling when the pollutants exceed admissible limits. Also this application allows the visualization and graphic representation of signals acquired in real time on the computer where is connected the acquisition board. Continuously acquired data are automatically stored in a database to be sent via Internet to a central station or a server for analysis, processing and interpretation thereof. Following these operations the human operator can take fairly and expeditiously decisions on emerged technological risks.

### **O.2.3. ENVIRONMENTAL POLLUTION AND PULMONARY DISEASE**

**M. Badea<sup>1\*</sup>, C. Gavris<sup>1</sup>, M. Emandi<sup>2</sup>, M. Moga<sup>1</sup>, J.L. Marty<sup>3</sup>, M. Radoi<sup>1</sup>**

<sup>1</sup> *Faculty of Medicine, Transilvania University of Brasov, Brasov, Romania*

<sup>2</sup> *Direction of Public Health, Brasov, Romania*

<sup>3</sup> *University of Perpignan Via Domitia, Perpignan, France  
mihaela.badea@unitbv.ro*

Environmental pollution is a current issue of great importance due to the pollutants effects produced on living systems (plants, animals and humans). Pollution can criminalize various factors, dependent on the chemical nature, the source of pollution, type living systems, the period of contact with living organisms, environmental conditions of the area (air circulation, temperature, humidity).

Chronic obstructive pulmonary disease (COPD) is a chronic respiratory disease that affects both bronchi (chronic bronchitis) and lungs (emphysema) and is manifested by progressive and irreversible narrowing of the bronchi, which causes a progressive decline in respiratory capacity.

Due to these very important issues is necessary to study the mechanisms that may explain the occurrence of COPD induced changes, but especially the possibilities of rapid testing and prevention. The management of primary and secondary prevention, as well as management of emergency situations, are extremely important to provide a good quality of life for people and increase their life expectancy.

**P.2.1.**  
**PHOTOACOUSTIC DETECTION OF POLLUTANT  
TRACE GASES FROM A MULTICOMPONENT  
MIXTURE SAMPLE**

**I.R. Ivascu<sup>1,2</sup>, C.E. Matei<sup>1</sup>, M. Patachia<sup>1</sup>, A.M. Bratu<sup>1</sup>, D.C. Dumitras<sup>1,2</sup>**

<sup>1</sup> *Department of Lasers, National Institute for Laser, Plasma, and Radiation  
Physics, 409 Atomistilor St., PO Box MG-36, 077125 Magurele, ROMANIA,*

<sup>2</sup> *Physics Department, Faculty of Applied Sciences, University "Politehnica" of  
Bucharest, 313 Splaiul Independentei, Bucharest - 060042, ROMANIA  
ioana.ivascu@inflpr.ro*

Among the multitude of methods dedicated to gas trace detection developed during the years, the photoacoustic spectroscopy is distinguished by its unique advantages such as high selectivity, large dynamic range and multicomponent capability. Based on the selective absorption of laser radiation by specific molecules, this technique became one of the most sensitive techniques in the world, being able to measure gas concentrations at sub-ppb levels (partial pressure of 10<sup>-10</sup> atm).

In this paper we focus on photoacoustic detection of some pollutant trace gases from a multicomponent mixture sample. Our determinations address the concentrations of several pollutants, mainly: ethylene, ethanol and methanol. The experimental set-up employs a tunable CO<sub>2</sub> laser with a wavelength spectrum between 9.2 μm and 10.8 μm of which 53 vibrational-rotational lines cover the molecular absorption spectra of the target pollutants. The gaseous samples under test are obtained by mixing different proportions of calibrated gases in terms of partial pressure, containing ethylene, ethanol and methanol diluted in nitrogen up to a total pressure equal to the atmospheric one. Exploiting the particular absorption fingerprint of each target pollutant with respect to the CO<sub>2</sub> laser spectrum, we derive the individual gas concentration from the multicomponent mixture based on a set of measured photoacoustic signal amplitudes corresponding to a predefined number of CO<sub>2</sub> laser lines. These results are the premise of further measurements for monitoring the air quality from polluted sites from urban area (e.g. underground network) or from rural area (e.g. green houses) where the presence of such pollutants in the ambient air, even at low level of concentration (ppm range), could affect the passengers and employees health.

**Acknowledgements**

*This work was supported by a grant of the Romanian Ministry of Education,  
CNCS – UEFISCDI, project PN-II-RU-PD-2012-3 - 0207.*

## **P.2.2. QUANTITATIVE DETERMINATION AND VOLTAMMETRIC BEHAVIOUR OF PESTICIDE IMINOCTADINE**

**R. Metelka<sup>1\*</sup>, S. Smarzewska<sup>2</sup>**

<sup>1</sup> *Department of Analytical Chemistry, Faculty of Chemical Technology,  
University of Pardubice, Pardubice, Czech Republic,*

<sup>2</sup> *Department of Inorganic and Analytical Chemistry, Faculty of Chemistry,  
University of Lodz, Lodz, Poland  
radovan.metelka@upce.cz*

Iminoctadine (1,1'-(iminodioctamethylene)diguanidine) (Fig.1) is a non-systemic aliphatic nitrogen contact fungicide which impairs functioning of membranes in fungi.

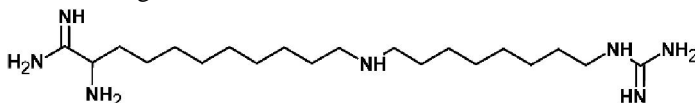


Fig. 1 Molecular structure of iminoctadine.

Iminoctadine is widely used on fruit, trees, and lawns to control a variety of pathogens including *Gloeodes* and *Alternaria*.

Iminoctadine (IOD) was determined in spiked river water samples by square wave voltammetry (SWV) using a cyclic renewable silver amalgam film electrode (Hg(Ag)FE). IOD signal was detected in Britton-Robinson buffer (pH 6.5) at -1.8 V versus Ag/AgCl. Validation of the method was carried out. The LOD and LOQ have been estimated to be  $2.6 \times 10^{-9}$  mol L<sup>-1</sup> and  $8.5 \times 10^{-9}$  mol L<sup>-1</sup>, respectively. The electrode mechanism based on frequency investigation was analysed under conditions of SWV. It was established that the voltammetric response in the presence of IOD is a result of catalytic hydrogen evolution.

### **P.2.3.**

## **REACTIONS AND TOXICITY OF SELECTED SUN PROTECTION COMPOUNDS IN WATERS**

**G. Grbovi<sup>1</sup>, O. Malev<sup>2</sup>, R. Sauerborn Klobu ar<sup>3</sup>, Ž. Cvetkovi<sup>4</sup>,  
B. Cvetkovi<sup>4</sup>, D. Dolenc<sup>5</sup>, T. Tišler<sup>6</sup>, A. Lebedev<sup>7</sup>, M. Sarakha<sup>8</sup>,  
P. Trebše<sup>2\*</sup>**

<sup>1</sup>*Center of Chemistry, Institute of Chemistry, Technology, and Metallurgy  
(ICTM), University of Belgrade, Serbia*

<sup>2</sup>*University of Nova Gorica, Nova Gorica, Slovenia*

<sup>3</sup>*Ru er Boškovi Institute, Division for Materials Chemistry, Zagreb,  
Croatia*

<sup>4</sup>*Institute of Public Health »Dr. Andrija Štampar«, Zagreb, Croatia*

<sup>5</sup>*University of Ljubljana, Faculty of Chemistry, Ljubljana, Slovenia*

<sup>6</sup>*National Institute of Chemistry, Ljubljana, Slovenia*

<sup>7</sup>*Moscow State Lomonosov University, Moscow, 119992, Russia*

<sup>8</sup>*Institute of Chemistry, University Blaise Pascal Clermont Ferrand,  
Clermont Ferrand, France  
polonca.trebse@ung.si*

In the present research selected benzophenones were applied as model compounds for the stability and toxicity studies of UV filters in presence of chlorine-based disinfectants. The results showed that benzophenones react with active chlorine to form 5-chloro and 3,5-dichloro derivatives. Chlorinated products were determined by LC-MS and compared with independently prepared standards. Toxic effects of BP-3, BP-4, and their chlorinated products were studied on bacteria *Vibrio fischeri*, algae *Desmodesmus subspicatus*, water fleas *Daphnia magna* and zebrafish *Danio rerio*. We found that UV filter BP3 was more toxic than BP4; the highest sensitivity was observed when water fleas and algae were used as test organisms.

DHHB and its chloro derivatives were tested for possible adverse effects on algae *Selenastrum capricornutum* (*Pseudokirchneriella subcapitata*) and *D. magna*. Obtained data demonstrated that algae were more sensitive to DHHB while *D. magna* was affected more by DHHB's chlorinated products. In general, algae resulted more sensitive to DHHB-mediated action compared to tested microcrustacean.

## **P.2.4. BIOSENSORS FOR PESTICIDES DETECTION IN SURFACE WATER**

**G.S Nunes<sup>1</sup>, I.N.M Ferreira<sup>1</sup>, F.G.S. Silva<sup>1</sup>, M. Badea<sup>2</sup>**

*<sup>1</sup>Núcleo de Análise de Resíduos de Pesticidas, NARP, Departamento de  
Tecnologia Química, Universidade Federal do Maranhão (UFMA), São  
Luís, MA, Brazil*

*<sup>2</sup> Faculty of Medicine, Transilvania University of Brasov, Brasov, Romania  
gilvanda-dapi@hotmail.com*

Amperometric biosensors based on acetylcholinesterase enzyme (AChE) have emerged in recent decades as promising techniques for the investigation of organophosphorus (OP) insecticides. In this work, a novel AChE- biosensor was constructed and used for the detection of OP in natural waters. The biosensor has been prepared by incorporating AChE to the graphite paste modified with tetracyanoquinodimethane (TCNQ) mediator in the presence of a macroalgae (*Cladophopsis membranous*) obtained from estuarine regions. Biosensor stability and sensitivity were evaluated and seem to be adequate for trace analysis. Inhibition curves against methyl parathion OP pesticide were constructed and used for the analysis of water samples collected from a demonstrably contaminated lake of São Luis island, Maranhão, Brazil. Water analysis revealed that the aquatic ecosystem was polluted by sub-ppm concentrations of the OP insecticide and a good correlation was found between biosensor and GC-MS techniques. Thus, the AChE-macroalgae-biosensor could be used as a low-cost and sensitive screening method for insecticide pollution.

**P.2.5.  
HEAVY METALS DETECTION USING  
ELECTROCHEMICAL AND ENZYME-CATALYSED  
METHODS**

**L. Chelmea<sup>1</sup>, C. Faraian<sup>1</sup>, L. Floroian<sup>1</sup>, Gh. Coman<sup>1</sup>, G.S. Nunes<sup>2</sup>,  
M. Badea<sup>1</sup>**

<sup>1</sup> *Faculty of Medicine, Transilvania University of Brasov, Brasov, Romania*

<sup>2</sup> *Núcleo de Análise de Resíduos de Pesticidas, NARP, Departamento de  
Tecnologia Química, Universidade Federal do Maranhão (UFMA), São  
Luís, MA, Brazil.*

*mihaela.badea@unitbv.ro*

Heavy metals are toxic compounds incriminated in several of toxicological mechanisms, through their effects on biosystems. It is therefore important to have specific, fast and cheap methods of detection from different samples: water, food, biological fluids.

This work has proposed to optimize the enzymatic electrochemical biosensors as viable alternatives for applications in toxicology, environmental analysis or studies on food quality.

There were studied and optimized analytical methods for possible detections of heavy metals (cadmium, lead) using free commercial and mutant acetylcholinesterase, as well as immobilized enzymes (electrochemical biosensors).

Studies have identified different inhibitory activities of the compounds studied, which can be exploited for analytical analysis of real samples. Using enzyme biosensors variants toxicology screening or assay provides rapid and sensitive analytical methods for quantification.

**Acknowledgements**

*This research was partially funded by the European Community's Seventh Framework Programme under grant agreement n° 245199. It has been carried out within the PlantLIBRA project (website: <http://www.plantlibra.eu>). This report does not necessarily reflect the Commission's views or its future policy on this area.*



**P.2.6.**  
**ENDOCRINE DISRUPTORS AND MATERNAL  
BEHAVIOUR**

**N. Bigiu<sup>1</sup>, M. Moga<sup>1</sup>, C.Glavce<sup>2</sup>**

<sup>1</sup> *Transilvania University of Brasov, Brasov, Romania*

<sup>2</sup> *Institutul de Antropologie Francisc I Rainer, Academia Romana,  
Buchaarest, Romania  
nicusoribigiu@yahoo.com*

Congenital abnormalities have traditionally been associated with genetically inherited conditions. Even though the importance of genes as factors in causation is accepted, environmental factors seem to be implicated just as strongly. There is very good evidence that pollutant-related congenital defects are widespread both in humans and wildlife but exhaustive review of all the literature has not yet been undertaken. The aims of this study are to meta-analyse the scientific reports concerning pollutants impact on congenital abnormalities and also to bind our congenital abnormalities data with the medical literature data. Researchers have become very interested in the relationship between the environment and malformations, bearing in mind that the developing fetus is more sensitive to all sorts of injuries than adults are, and that these injuries may result in a life-long handicap. There are relatively few environmental pollution exposures for which strong conclusions can be drawn, with respect to their potential to cause congenital abnormalities, since many variables (strength, consistency and specificity of an association, appropriate timing, dose-response relationship) can interfere the causal nature of an association in teratology.

**P.2.7.  
COMMUNITY RISK ASSESSMENT IN BRASOV  
COUNTY FOLLOWING EXPOSURE  
TO "POLLUTED" AIR**

**M. Emandi<sup>1\*</sup>, M. Badea<sup>2</sup>, M.Moga<sup>2</sup>, L. Rogozea<sup>2</sup>**

<sup>1</sup> *Direction of Public Health, Brasov, Romania*

<sup>2</sup> *Faculty of Medicine, Transilvania University of Brasov, Brasov, Romania.  
mihaelaemandi@yahoo.com*

Increased risk factors faced by both the general population and active populations are due equally to increasing urbanization and impetuous development of various industrial sectors.

Air quality from Brasov and surroundings is monitorized from the point of view of the pressure of cars traffic, and of the effect that various activities (various industries) have. The cars traffic, as main source of air pollution is particularly intense, generating pollution with NO<sub>x</sub>, SO<sub>2</sub>, CO, O<sub>3</sub>, Polycyclic Aromatic Hydrocarbons. (PAHs), dust, noise and others. Monitoring these compounds was able to identify problem areas and take action by flowing road roundabouts arrangements.

Evaluation of the activity of the various industries it has done by environmental studies and studies on the health of people around these objectives. Based on these findings, some of the companies was moved outside the city of Brasov (Lubrifen, Tamiv), while for others have been applied measures to remedy the non-conformity.



*New Trends on Sensing- Monitoring- Telediagnosis for Life Sciences,  
Brasov, Romania - July 24-26, 2014*

# **Telediagnosis for Medicine**

**PL.3.1.**  
**M-HEALTH PROJECT DIABESITY 2.0**  
**FOR SELF MANAGEMENT CARE**

**F. Sicurello<sup>1,2\*</sup>, G. Mauri<sup>2</sup>, G. Castelnuovo<sup>3</sup>, E. Santoro<sup>4</sup>, S. Pruna<sup>5</sup>,  
M. Clarke<sup>6</sup>, R. Bassetto<sup>7</sup>, A. Hajdu<sup>8</sup>, L. Kovacs<sup>9</sup>,  
L. Lhotska<sup>10</sup>**

*<sup>1</sup>International Institute of Tele-Medicine, Italy; <sup>2</sup> University Bicocca of Milan, Italy; <sup>3</sup> Catholic University, Milan; <sup>4</sup> Institute “Mario Negri”, Milan; <sup>5</sup> Institute “Paulescu”, Bucharest, Romania; <sup>6</sup> Brunel University, London, UK; <sup>7</sup>AP Systems, Italy; <sup>8</sup> Debrecen University, Hungary; <sup>9</sup> Obuda University, Budapest; <sup>10</sup> Czech Technical University, Prague, Czech Republic  
[francesco.sicurello@itb.cnr.it](mailto:francesco.sicurello@itb.cnr.it)*

Obesity and physical inactivity are emerging as an important public health problem that increases the risk of many health complications such as type 2 diabetes. The prevalence of diabetes for all age-groups worldwide is estimated to rise to 366 million in 2030. Diabetes-related disabilities reduce quality of life with enormous increase of direct and indirect costs. DIABESITY 2.0 is an innovative integrated scalable secure platform using m-Health technologies for remote monitoring and treatment of patients. The system provides real-time services for empowering diabetic and obese citizens in self-monitoring and self-management through the use of mobile devices. It is based on collecting/integrating critical information on the metabolic profile, diet, physical activity, psychological and social features in order to create successful monitoring protocols and treatments for diabetes at the very early stage, so increasing quality-of-life of patients and helping doctors and health operators.

DIABESITY 2.0 has the objective to address the not yet solved issues of the existing m-Health applications:

- Integration of background medical knowledge, data from biosensors and user's manual input into the applications.
- Identification of cost-effective ways of providing high-quality healthcare.
- Identification of the real impact of the technological platform in providing benefits in obesity and diabetes.

### **K.3.1.**

## **PROTEOMICS - NEW TOOLS FOR PERSONALIZED MEDICINE**

**C. Tanase\*, E. Codrici, D. I. Popescu, S. Mihai, A-M. Enciu,  
A. Nita, R. Albulescu**

*Victor Babes National Institute of Pathology, Bucharest, Romania,  
bioch@vbabes.ro*

Personalized medicine promotes the concept of the right therapy for the right group of patients, at the right moment, with the right cost. Personalized medicine will focus on an individual approach, and its nature will be proactive.

Systems biology and systems medicine has led to a “P4 medicine” that is predictive, preventive, personalized, and participatory. The future of medicine relies on such personalization.

Personalized medicine is designed medicine based on “Omics” contribution. The need to apply molecular screening in order to improve the diagnosis is crucial in most of the pathologies.

The incorporation of proteomics in the further development of the personalized medicine concept is a more recent phenomenon, and has given rise to a complete image of the health/disease status of an individual, especially at functional level.

In order to identify new circulating biomarkers, high throughput proteomic technologies, such as mass spectrometry (SELDI-ToF, MALDI-ToF), 2D-DIGE, multiplexed and protein microarray are being used. Proteomics can generate new and useful information by identifying and establishing protein-protein interactions at intra- and intercellular level.

The most recent tendency in personalized medicine approach relies on the “5P medicine”, which constitutes a health concept focused on each individual patient.

### **Acknowledgment**

*The present work was supported by project PNII 93/02.07.2012, PN 09.33-04.15 and PN 09.33-03.10.*

### **K.3.2.**

## **PERIODONTAL RISK ANALYSIS BASED ON SALIVARY COTININE AND OTHER MICROBIOLOGICAL AND BIOCHEMICAL SALIVARY FACTORS**

**C. Nuca, D.P. Balaban, V. Badea, A. Caraiane**

*Faculty of Dentistry, Ovidius University, Constanta, Romania  
medcris@yahoo.com*

The lecture deal with telemonitoring the periodontal risk based on salivary cotinine and other microbiological and biochemical salivary factors, being available for: online dental education in preventive dentistry/periodontal risk assessment, using the theoretical information and telemonitoring of periodontal risk based on the methods used in the presented studies.

If we consider the situations with long-term unavailability of dental care, e.g. rural communities, teledentistry/telemonitoring of oral diseases is an appropriate solution, improving ready access to preventive dental care. In underserved areas, where videoconferencing systems are not available, it can be applied the remote monitoring method, in which patients are monitored at a distance and can either be hospital-based or home-based. They are needed: volunteers from medical staff, schools staff, caregivers, etc., videoconferencing system for online training in terms to give information regarding periodontal health/risk (lectures), online training of the volunteers regarding the use of biomarkers in the periodontal risk assessment (seminars), underserved community (adults, teenagers, etc.) and tests for assessment of the periodontal risk.

The studies presented in this lecture, regarding the monitoring of periodontal risk based on salivary cotinine, microbial biomarkers, IL-1 and salivary 8-OHdG can be used as models and can be applied in a teledentistry system.

**O.3.1.**  
**TELEMEDICINE IN ROMANIA – AN ETHICAL  
CHALLENGE FOR AUTHORITIES**

**L. Rogozea\* , D. Purcaru, I. Bârsan, M. Badea, E. Banu, A. Repanovici**

*Universitatea Transilvania din Bra ov, Brasov, Romania  
r\_liliana@yahoo.com*

The Internet change how medical professionals give and receive information about health and health care.

All medical professional (medical doctors, nurses, kinetotherapist, medical engineering etc.) who use the Internet for receive information about health care, researches in medical field, about create or sell health products or services and they must be oriented by professional in this domain and join together to create a safe environment and enhance the value of the Internet for meeting health care needs.

It is not enough to develop project in telemedicine fields like: emergency telemedicine, telemedicine from Danube Delta or telemedicine project which connect different region from the globe (like project Timisoara-Treviso), but is also important to educate the young generation about using in an ethical way of all facilities used in telemedicine.

Is the role of the teacher to oriented their students not only how to use the electronic communication, how to verify the information, but also how we could create a large base of knowledge for sharing the educational experience including in telemedicine fields.

Even if in Romania are some problems with the possibility of accessing the Internet all the time and from people from different region, more and more young students from the faculty of medicine or nursing use the electronic communication for their training and also become able to use e-communication including in telemedicine.



### **O.3.2.**

## **PREDICTIVE DATA MINING TECHNIQUES APPLIED IN HEALTHCARE MANAGEMENT**

**I.I. Moasil, L.G. Bera**

*ITI Research Center, Faculty of Sciences, “Lucian Blaga” University of  
Sibiu, Sibiu, Romania  
im25sibiu@gmail.com*

Healthcare management is the field related to the planning, coordination and supervision of the delivery of healthcare services. Today managers and decision-makers have to cope with a huge, still growing, quantity of health related data. This is a blessing and a curse. It is a blessing for all these data are issued from the acquired knowledge and experience, and it is a curse for their diversity and complexity make difficult their analysis and exploitation. Happily more and more information are in digital format and new, advanced technologies allow the discovery and extraction of patterns or knowledge from large data sources (data bases, documents, images, flat files, web etc.). Data mining evolved as a multidisciplinary field (machine learning, statistics, AI, information retrieval, visualisation) offering instruments for data analysis and the building of predictive models. In healthcare management, predictive data mining can be extremely valuable. Predictive data mining is goal directed. Each problem has its specificity and the corresponding data collection. In general any predictive data mining process has four stages: data preparation, data reduction, data modelling and prediction, and evaluation and validation of the model (case and solution analysis). In our paper we start by briefly discussing the main concepts of data mining and continue with presenting different modelling techniques to extract from data sets predictive models for prognosis, caring plans, therapeutic plans, users` behaviour, resources management etc. In the end we discuss the importance of selecting the appropriate data mining techniques and also that of the role of the human data analyst.

### **O.3.3.**

## **HUMAN BREATH BIOMARKER FOR CLINICAL DIAGNOSIS BY PHOTOACOUSTIC SPECTROSCOPY TECHNIQUE**

**C. Popa<sup>1,2</sup>, S. Banita<sup>1</sup>, M. Patachia<sup>1</sup>, C. Matei<sup>1,2</sup>, A.M. Bratu<sup>1</sup>,  
M. Petrus<sup>1</sup>, D.C. Dumitras<sup>1,2</sup>**

<sup>1</sup> *Department of Lasers, National Institute for Laser, Plasma, and Radiation  
Physics, Magurele, Romania,*

<sup>2</sup> *Physics Department, Faculty of Applied Sciences, University  
"Politehnica" of Bucharest, Bucharest, Romania  
cristina.achim@infpr.ro*

Photoacoustic spectroscopy technique (LPAS) is maturing rapidly in its applications to real world problems. Some of the most burning problems of the current turbulent times are to improve the prediction of cancer risk and to prevent obesity, being a candidate technology for breath analysis applications.

This research aims at analyzing a new opportunity for LPAS method in a new frontier of medical testing: exhaled breath analysis (the oxidative stress and electronic cigarettes efficacy in smoker subjects and the overexertion in an aerobic program like kangoo jumps-KJ).

In the case of KJ exercises we found out that the mixture of exhaled breath in women's after the aerobic exercises contains low concentration of ethylene compared to exhaled breath of women before the start of exercise program. This result can give valuable information on the contribution to reduce the generation of pro-oxidants during and after KJ aerobic.

In the case of smoker subjects was found higher levels of ethylene in the composition of breath after traditional cigarettes inhalation in comparison with the inhalation with electronic cigarettes. This result revealed that there is no risk free level of exposure to traditional smoke and electronic cigarettes may provide an alternative to traditional cigarettes smoking.

Exhaled breath air analysis using CO<sub>2</sub> laser-photoacoustic spectroscopy is a non-invasive method, safe, rapid and acceptable to subjects, with promising potential in monitoring and diagnostics of ethylene patterns from subjects.

### **O.3.4.**

## **FORENSIC FILIATION TESTING, THE SCIENTIFIC EVIDENCE WHICH TRANSFERS THE PATERNITY DETERMINATION ISSUE FROM THE JUDICIAL FIELD TO THE FIELD OF MEDICINE**

**I. Nicolae**

*Faculty of Law, Brasov, Transilvania University of Brasov, Romania  
ioana.nicolae@unitbv.ro*

Although the issue of determining the paternity of a child born from an extramarital relationship, assuming that the child is not recognized by its putative father from outside the wedlock, is a strictly judicial problem of the exclusive competence of the court, today's advanced scientific methods allow the transfer of the issue from the court to the field of forensic filiation expertise. Filiation tests provide highly accurate and reliable evidence, which reduces to minimum and sometimes even eliminates the court's intervention. Forensic expertise of filiation can thus be considered the most important element of evidence for determining the child's paternity since it establishes with certitude whether or not the defendant is the father of the child under investigation.

### **O.3.5.**

## **MENTAL HEALTH AND TECHNOLOGY: AN APPROACH FOR PATIENTS WITH DEPRESSIVE DISSORDER**

**M. Bran<sup>1\*</sup>, M. Ladea<sup>2</sup>, V. Briciu<sup>3</sup>, N. Petcu<sup>3</sup>**

<sup>1</sup>*Coltea Hospital, Bucharest, Romania*

<sup>2</sup>*University of Medicine and Pharmacy “Carol Davila”, Bucharest,  
Romania*

<sup>3</sup>*Transilvania University of Brasov, Romania  
mihaibran@gmail.com*

Since its inception, the internet has rapidly become the largest source of information worldwide. Health information has seen an exponential increase in accessibility with the advent of this technology. A more involved and informed patient is unarguably a positive change, but sources of information on the internet are varied and largely unregulated. The internet is not only an information source but it is increasingly recognized as a powerful tool for intervention and prevention mental health programs. Our research will point out the advantages and disadvantages of Romanian online platforms developed for patients with different mental disorders. The main focus will be on depresiv.ro, an innovative platform for patients with depressive disorder developed by a Romanian non-governmental organization.

**O.3.6.**  
**FI-STAR ONLINE PERSONALISED CARDIAC  
REHABILITATION SOLUTION**

**S.S. Busnatu, C. Sinescu**

*University of Medicine and Pharmacy “Carol Davila”, Bucharest, Romania  
stefan.busnatu@umf.ro, crina.sinescu@umf.ro*

**Background:** Advanced disease prevention solutions are vital in order to decrease the burden produced by the cardio-vascular diseases on patients and on the medical system.

**Method:** The Cardiac Rehabilitation application is built from scratch. Clinical trials start in July 2015. Study groups consist of 48 acute myocardial infarction patients: 24 home monitored, 24 control group performing unmonitored rehabilitation. The process will have two phases: the inpatient period (5-7 days) and the outpatient period (9 weeks). The monitored group will receive a kit of monitoring devices a blood pressure device, a cardio watch, a puls-oxymeter, a ECG chest strap and a Smartphone with the application installed. The application will contain the nutritional, medical and physical activity plan and also has monitoring and treatment adjustment functions by the medical personnel. Before hospital discharge and at the end of the program all patients will take an ECG treadmill test, which summed with other medical investigations, will quantify the cardiac fitness level.

**Results:** Documented at the evaluation and validation phase of the trial in July 2015.

**Conclusions:** The Online Cardiac rehabilitation solution offers more patient independence, improves the cardiac fitness and quality of life and reduces the high expenses of the medical system.

### **O.3.7.**

## **ELECTRICAL STORMS IN PATIENTS WITH AN IMPLANTABLE CARDIOVERTER DEFIBRILLATOR**

**D. Tint**<sup>1,2\*</sup>, **F.O. Ortan**<sup>2</sup>, **S. Micu**<sup>2</sup>

<sup>1</sup>*Faculty of Medicine, "Transilvania" University, Brasov, Romania*

<sup>2</sup>*ICCO Clinics, Brasov, Romania*

*dianatint@gmail.com*

**Introduction:** Implantable defibrillators are lifesavers and have improved mortality rates in patients at risk of sudden death, both in primary and secondary prevention. However, they are unable to modify the myocardial substrate, which remains susceptible to life-threatening ventricular arrhythmias.

Electrical storm is defined as the occurrence of three or more distinct episodes of ventricular tachycardia or ventricular fibrillation in 24 hours, requiring the intervention of the defibrillator.

**Materials and Methods:** We assessed the prevalence, features, and predictors of ES in 199 patients with ICD implanted at ICCO clinics between 01.02.2009-31.12.2013. The mean age was 62,59 ± 11,13.

**Results:** Most of the patients were men (175 p, 88%). The defibrillator was implanted for primary prevention of sudden cardiac death in 147 patients (73,8%). According the type of the device, 114 pts (57,28%) received a single chamber defibrillator, 17 pts (8,5%) dual chamber defibrillator and 68 pts (34%) have received resynchronization therapy with defibrillation support. Most of the pts. have had dilated ischemic cardiomyopathy, 60 pts (30%) presented non-ischemic cardiomyopathy and in 14% of patients defibrillator was implanted for other pathologies. ES was present in 10 pts (5%).

**Conclusion:** ES is not a rare event in patients with an ICD. Non-ischemic DCMP is an independent predictor of ES. Patients with VF or with a structurally normal heart are less likely to experience ES.

**O.3.8.**  
**CONSIDERATIONS ON THE MONITORING PATIENTS  
WITH VARIOUS PATHOLOGIES**

**I.D. Carpus**

*Faculty of Medicine, "Titu Maiorescu" University, Bucharest, Romania  
icarpus@yahoo.com*

Knowledge-based society relies on two broad categories of vectors, respectively technological and functional vectors. In the case of patient monitoring, technological vectors include the technology of obtaining electronic, textile components, information & communication technology, etc. Functional vectors include biological know-ledge, genomics, health care system on social, individual levels, interactive learning system, etc. Medical e-textiles are materials able to sense and react to external or internal stimuli. Stimuli and responses nature may be electrical, chemical, thermal, magnetic, radiant and other sources. Potential applications can be in the field of complementary investigations, of prevention and medical treatment. The starting point in identifying, defining physiological, biomechanical signals that can be monitored to collect information on women's health status during pregnancy is the study of organic pathophysiological mechanisms. The article presents the preliminary experimental results of the pregnant women respiratory monitoring by means of a piezoelectric microsensor attached to a garment. The experiments proved the viability of the proposed system and are a starting point for the continuation of medical studies for a research that is in line with the strategic objectives of European Programmes.

### **O.3.9.**

## **BIOMARKERS IN DIAGNOSIS AND ASSESSMENT OF SYSTEMIC DISEASES**

**T. Koszegi\* , Z. Horvath-Szalai, P. Kustan**

*Institute of Laboratory Medicine, University of Pecs, Hungary  
tamas.koszegi@aok.pte.hu*

Systemic inflammatory diseases belong to a group of different etiology: from autoimmune origin to microbial sepsis as well. Early diagnosis and monitoring of treatment efficacy is of utmost importance for proper patient care. Protein biomarkers may accelerate the diagnosis of the underlying disease and are also suitable for assessment of its severity. In bacterial sepsis measurement of serum concentrations of pro-inflammatory cytokines, procalcitonin (PCT) and acute phase proteins such as CRP and orosomucoid (ORM) fulfill these requirements. Recently, serum actin and gelsolin have been shown to predict sepsis mortality. Quite unexpectedly, in many systemic inflammatory processes urinary ORM increases dramatically. In our studies, we measured the serum concentrations of pro-inflammatory cytokines, PCT, CRP, actin and gelsolin of septic patients. ORM was assessed from urine samples. We found that actin/gelsolin ratio had a better predictive value than PCT and urinary levels of ORM increased up to 50-fold compared to the control group. In systemic diseases bedside point of care tests are also used (glucose, prothrombin activity, IL-6, troponin-T, etc.) which can easily be adjusted to telemonitoring and telediagnostic purposes.



**O.3.10.**  
**TELEMEDICINE: A GREAT OPPORTUNITY FOR  
RECOVERY BY KINETOTHERAPY IN LIMB  
TRAUMA**

**D.O. Grigorescu\* , S. Grigorescu**

*Transilvania University Brasov, Brasov, Romania  
dan\_o\_grigorescu@yahoo.com*

**Introduction.** Good quality surgical treatment in limbs trauma can be obtained only by recovery through kineto-therapy. Problems arise when patients have limited or impossible access to such medical services because of distance or daily high costs.

**The aim of the study.** An analysis of patients with limb trauma option for recovery through kineto-therapy provided by telemedicine versus recovery in out-patient clinic is proposed. It was analyzed also if the incidence of the option of recovery by telemedicine is significantly different from patients at great distance from the out-patient clinic or without financial means, to those who lacked these conditionings.

**Material and method.** A prospective study which subjects a target group (TG) of patients without possibilities of periodic presence (54) and a control group (CG) of patients with such possibilities (50), to whom it was applied a questionnaire concerning the recovery option „face to face” with the therapist versus remote rehabilitation by telemedicine.

**Results.** A comparative analysis of the desire to do recovery by kineto-therapy in the two groups was made: 84% in TG, compared to 95% at CG. Subsequently it was examined the subjects’ option to not be permanently present, ascertaining that: a) the non-adherence to recovery has a higher incidence of 2.8 times in TG to CG if most important is the distance considered as consumed time b) the non-adherence to recovery has a higher incidence of 4.7 times in TG to CG if then option is linked to the distance, as well as the costs of travel. In the questionnaire results also a solid statistical option in TG (92%) to make efforts to find IT facilities to make possible near in order to take advantage of recovery through telemedicine.

**Conclusions.** Telemedicine is the only option and, therefore, a great opportunity for patients requiring recovery through physical therapy, but without temporal/financial possibilities to allow them the presence in out-patient clinic.

**O.3.11.  
RESEARCH ON OPTIMIZING TREATMENT OF  
PREGNANT WOMEN WITH CARDIOVASCULAR  
DISORDERS**

**I.D. Carpus\* , V. Stoleru**

*Faculty of Medicine, "Titu Maiorescu" University, Bucharest, Romania  
icarpus@yahoo.com*

**Aim.** Women with pre-existing disease are less able to handle with super conditions added to the pregnancy. In these cases, appropriate management could be based both on observational studies and the use of results obtained as a result of application of experimental investigations that were conducted according to appropriate computational programs.

**Method.** For a clinical case study (33 weeks pregnancy, monomorphic ventricular extrasystole arrhythmia with tendency to systematize, normochromic anemia, mixed dyslipidemia), a systemic analysis, using two-variable central composite rotatable factorial program has been performed in order to obtain more accurate data on the influence of Sotalol dose (mg / day) and the value of hypocalcemia (mg / dl) on the resultant variable QTc (ms).

**Results.** Percent deviations are below 10 %, which indicates truthfulness obtained model, namely its ability to represent mathematically the change of QTc feature. The coefficient of multiple determination shows that the influence of the two independent variables on the resultant is 97.03 %, the rest being due to other factors.

**Conclusion.** The relation of interdependence can be a rapid tool that could potentially be used by experts and/or students in optimizing clinical treatment

### **O.3.12**

## **THE USEFULNESS OF THE BURNS DIAGNOSIS AND TREATMENT BY TELEMEDICINE**

**D.O. Grigorescu<sup>\*</sup>, S. Grigorescu**

*Transilvania University Brasov, Brasov, Romania  
dan\_o\_grigorescu@yahoo.com*

**Introduction.** Domestic burns occur especially in low social development areas, in which general practitioners (GP) must ensure proper diagnosis and treatment. **The study aim.** To determine the GP need to be endorsed (through telemedicine) by specialists to provide proper medical support for the treatment of burns.

**Material and method.** The study was based on questionnaire method applied to GP from Brasov County rural areas. Of all 157, could be reached 85 and took part in the study only 48. It was included 18 dispersed items belonging to 3 dimensions with analytical relevance: 1. adherence of the subjects to be supervised by using telemedicine; 2. estimation of the patients' adhesion to a medical assistance that doesn't require leaving home; 3. involvement assessment of subjects in self-endowment of the IT support needed.

**Results.** The subjects' adherence to the telemedicine in burns was unanimous (98%-47/48), but only for superficial and intermediate burns and under optimal collaboration conditions (quick and secure voice communication access, the possibility of receiving images on-line within 30 minutes after the initiation of communication, the existence of specific sanitary materials). Adhesion was much reduced (37%-18/48) in the absence of one of these three factors, and very low (8%-4/48) in the absence of two of the three. The subjects evaluated a significant adhesion of the patients for treatment in the territory (93%-45/48), but less in terms of treatment performed in their medical units (73%-35/48). The subjects' option in allocation of personal financial resources in this type of activity has been almost non-existent (4or %-2/48) from those who do not have the necessary facilities at present, slightly more (17%-8/48) from those that require only small additions.

**Conclusions.** Telemedicine would enjoy an increased adhesion in the treatment of burns by general practitioners in communities with low material and educational resources, but only if the health system support provides the needed logistical and material resources.

**O.3.13.**

**TELEMONITORING FOR GLYCAEMIC CONTROL IN  
PATIENTS WITH DIABETES**

**A.M. Pascu<sup>\*</sup>, M. Badea, P. Ifteni, M. Moga**

*Faculty of Medicine, Transilvania University of Brasov, Romania  
a10pascu@yahoo.com*

Glycaemic control is crucial for reducing the incidence of diabetes complications. However, routine practice demonstrates this objective to be hard to achieve. Telemonitoring might be a challenge to improve diabetic patients' care. Remote monitoring might improve the accessibility to, and the ability of healthcare professionals and patients to engage in more efficient control and adequate treatment adjustment for long-term diabetes survey. However, although technological developments allow the evolution of telemedicine from desktop to wearable technologies (mobile, wireless, bluetooth connected devices), the efficacy of long-term remote monitoring of diabetic patients is still under discussion.

**O.3.14.**  
**IMAGE GUIDED-DRUG DELIVERY AND  
NANOTHERANOSTICS**

**M. Neagu<sup>1\*</sup>, C. Constantin<sup>1</sup>, A. Lupu<sup>1</sup>, G. Dumitrascu<sup>1</sup>,  
S. Zurac<sup>2</sup>, D. Boda<sup>3</sup>**

<sup>1</sup> *Victor Babes National Institute of Pathology, Bucharest, Romania,*

<sup>2</sup> *Clinical Hospital Colentina, Bucharest, Romania.*

<sup>3</sup> *“Carol Davila” University of Medicine and Pharmacy, Bucharest  
Romania.*

*neagu.monica@gmail.com*

Nanotechnology is an expanding platform that allows the conception of new materials for a growing array of purposes ranging from medical, electronic, biomaterials, to green energy production. In nanomedicine, it has endless possibilities, developing biocompatible-nanomaterials, nanoelectronic biosensors, nano-drugs and “nano-surgeons” in the future. One up-close application of this technology is the use of targeted nanocarriers to transport drugs to a specific target where they can be released.

Searching for combined methods, ‘all-in-one’ type, nanotheranostics domain emerged several years ago being the integrated combination of target-specific diagnostics and delivery of therapeutics based on nanotechnology platforms.

The problems that occur in this field will be discussed such as: the carrier type (liposomes, polymers, micelles, antibodies), the accessibility of the actual molecular target(s), the significance of (pre-) clinical evidence, the value of the therapy in the context of an evolving disease, the clinically pertinent targeted-imaging, the clinically feasible targeted-delivery, the needed preclinical model for testing in vivo efficacy and safety and many more.

When combining imagistics to nanotheranostics new issues emerge, namely non-invasive assessment, drug biodistribution in the target, controlled drug release and so on.

While this domain’s challenges are daunting, solving them can bring us one giant step forward to personalised medicine.

***Acknowledgments: PN-II-ID-PCE-2011-3-0918, PN. 09.33-01.01.***

**O.3.15.**  
**OUT OF HOUR PALLIATIVE CARE CONSULT  
SERVICE FOR PATIENTS IN BRASOV COUNTY**

**D. Mosoiu<sup>1,2\*</sup>, M. Pop<sup>2</sup>, R. Horeica<sup>2</sup>**

*<sup>1</sup> Faculty of Medicine, Transilvania University of Brasov, Romania*

*<sup>2</sup> Hospice Casa Sperantei, Brasov, Romania*

*daniela.mosoiu@hospice.ro*

Palliative care as understood in the national strategy developed by the Romanian coalition of palliative care providers is looking at delivering care according to complexity of cases and place of care as follows:

- support for self care
- general palliative care
- specialized palliative care.

Specialized services apart of delivering direct care to patients with complex needs (severe symptoms, co morbidities, etc) have the role to offer support for the first 2 levels.

Hospice Casa Sperantei, the specialized palliative care leading service in Romania, is caring for around 1200 new adult patients yearly, both in home care ( coverage area Brasov and 15 km around Brasov), outpatients no restrictions, in patient 13 beds, day center. It has piloted a since 2014 a consult telephone service for out of hours to serve outpatients and home care patients. The service is available from 4 pm to 7 am and is staffed with highly trained palliative care nurses who can access on telephone the weekly on call palliative care doctor if the patients needs are outside the area of their competence. In the first 5 months the service had 1276 interventions out of them 633 for monitoring outpatients according to the frequency established during the face to face visit and 543 interventions for symptom control(pain, anxiety, dispnea where the most frequent), family support in applying the terminal care protocol, Information/ explanation concerning prescribed medication, drug administration, service admission, etc.

The service was set up with support from the Swiss Romanian Cooperation Program.

### **O.3.16.**

## **THE USE OF DIGITAL SIMULATING DEVICES FOR THE IMPROVEMENT OF THE 'LEARNING CURVE' OF LAPAROSCOPIC SURGERY**

**A.S. Mironescu<sup>1,2\*</sup>, L.I. Muntean<sup>1,2</sup>, L. Vida<sup>1,2</sup>, M. Moga<sup>1,3</sup>, C.  
Arvatescu<sup>1,3</sup>**

<sup>1</sup> *Faculty of Medicine, Transilvania University of Brasov, Romania*

<sup>2</sup> *Children Clinical Hospital of Brasov, Romania*

<sup>3</sup> *Obstetrics and Gynecology Clinical Hospital of Brasov, Romania  
aurel.mironescu@unitbv.ro*

**Aim:** Presenting personal and literature data to support the actual trend concerning the use of simulation in training surgical skills and their transfer to the operating room for the laparoscopic procedures.

**Background:** The training of surgical skills based on simulation assumes that this process is directly transferable to the operating room, but only a few communications have investigated the real benefit of simulation-based training on surgical performances.

**Method:** Based on the systematic reviews of the subject, one in 2006 and its update in 2014, we intend to determine the most relevant studies and systemize the most important assessments and final consensus decisions on the subject.

**Conclusions:** Most of the studies confirm that simulation-based skills are transferable to the operating room. Further studies are needed to definitely confirm these preliminary findings.

**O.3.17.**  
**SIDE EFFECTS OF USING ADVANCED  
INFORMATION TECHNOLOGIES IN HEALTHCARE**

**I.I. Moasil<sup>1</sup>, L. Rogozea<sup>2</sup>**

<sup>1</sup> *Lucian Blaga University of Sibiu, Sibiu, Romania*

<sup>2</sup> *Transilvania University Brasov, Brasov, Romania  
im25sibiu@gmail.com*

The extremely rapid progresses in information and communication technologies have lead to innovative applications that help the improvement of health care and the increase of life expectancy. Almost all fields of medicine and public health are the beneficiary of advances in artificial intelligence, data management, image processing, cloud computing, telematics and more others. Furthermore the health consumer can have access to health assessment on a mobile device, his health status can be continuously monitored through different sensors, and physicians can use non-invasive techniques and have remote access to data and/or advanced medical equipment. And to these we must add all the possibilities offered by the Internet and Web 2.0. In our paper we are not discussing the advantages of using information technologies in health care, but we are focusing on some side effects.

First we are briefly presenting aspects concerning sensitive data security, software and equipment reliability, the need of a specific infrastructure from legal regulations to good quality communication networks. Then we are tackling the impact of Internet and its implications for medical education, research and practice. Last but not least our paper will discuss new trends as infodemiology and infoveillance.



### **O.3.18.**

## **TELECARDIOLOGY IN HEART FAILURE**

**D. Tint<sup>1,2,\*</sup>**

<sup>1</sup>*Faculty of Medicine, Transilvania University of Brasov, Romania*

<sup>2</sup>*ICCO Clinics, Brasov, Romania  
dianatint@gmail.com*

Congestive heart failure (HF) is a serious public health problem due to its prevalence, high mortality, high morbidity, and the expense of ongoing therapy. Heart failure is also associated with a high rate of hospitalization since approximately 50% of HF patients are rehospitalized within 6 months of discharge.

Most of the successful CHF disease management programs have been built around close clinical follow-up.

Intervention programmes based on comprehensive care and intensive follow-up by a multidisciplinary team have recently achieved a promising reduction in admissions and costs.

The main models used in daily practice are: Structured telephone support (STS) consists in monitoring and/or self-care management delivered using simple telephone technology (data may have been collected and stored by a computer) and Telemonitoring (TM) that represents a digital/broadband/satellite/wireless/blue-tooth transmission of physiological data.

Also, a reliable method for early detection and chronic monitoring of fluid status is desirable and an innovative technological approach to HF management involves use of stand-alone devices designed exclusively for the telemonitoring of cardiac function by measurement of various parameters.

**O.3.19.**

**MEDICALLY ASSISTED HUMAN REPRODUCTION  
WITH THIRD PARTY DONOR - A MEDICAL AND  
LEGAL APPROACH**

**I. Nicolae**

*Faculty of Law, Transilvania University of Bra ov, Bra ov, România  
ioana.nicolae@unitbv.ro*

In the context of the entry into force of the new Civil Code on October 1<sup>st</sup> 2011, medically assisted human reproduction with third-party donor was given a general judicial framework. However, approaching the issue of medically assisted human reproduction from a strictly judicial perspective is impracticable. This paper intends to start from the judicial framework as set by the Civil Code, yet without ignoring the medical details which allow the achievement of medically assisted human reproduction with third-party donor. Medically assisted human reproduction with third-party donor represents a challenge to the medical community and the jurists as well, including its final „product”, the new-born child, and its rights arising from this status. Medically assisted human reproduction constitutes one of the extravagances of scientific research, a creation of the researchers but also of the legislators, a technique by which persons unable to have children can achieve this goal.

**O.3.20.**

**SPECTROSCOPIC ANALYSIS OF SURGICAL SMOKE  
PRODUCED IN VITRO BY LASER VAPORIZATION  
OF ANIMAL TISSUES IN A CLOSED GASEOUS  
ENVIRONMENT**

**M. Petrus<sup>\*</sup>, A.M. Bratu, C. Popa, M. Patachia, C. Matei, S. Banita,  
D.C. Dumitras**

*Department of Lasers, National Institute for Laser, Plasma and Radiation  
Physics, Bucharest, Romania  
mioara.petrus@inflpr.ro*

A quantitative analysis of surgical smoke produced *in vitro* by CO<sub>2</sub> laser vaporization of different fresh animal tissues in closed nitrogen atmosphere was investigated. Using the laser photoacoustic spectroscopy technique, the concentration of acetonitrile, acrolein, ammonia, benzene, ethylene and toluene from surgical smoke was determined. Laser photoacoustic spectroscopy (LPAS) is a sensitive technique for detection and monitoring of trace gases at very low concentrations. The average gas concentrations measured in the smoke samples with our LPAS system are acetonitrile - 190 ppm, acrolein - 35 ppm, ammonia - 25 ppm, benzene 20 - ppm, ethylene - 0.410 ppm, and toluene - 45 ppm for kidney, muscle, skin and heart pig tissues, but gas concentrations may vary from sample to sample. The toxic gas concentrations in smoke samples depend proportionally with the laser vaporization power and with the exposure time, but also depend on tissue type.

### **O.3.21.**

## **JUDICIAL BIODETECTION – E-SOLUTIONS**

**D. Gabor, A.M. Cornelia, N. Roman, L. Rogozea<sup>\*</sup>, A. Repanovici**

*Universitatea Transilvania din Brasov, Brasov, Romania  
r\_liliana@yahoo.com*

**Introduction:** The polygraph (lie detector) is an instrument which registers all psycho-physiological reactions by analyzing the subject's conscience.

Polygraph tests are useful in cases of theft, fraud, rubbery, information leakage, verifying information, doping, sexual abuse, proving innocence, fidelity, CV-verification.

Computerized polygraph system LX 4000 - multifunctional recording, storing and analyzing physiological changes during testing. This system includes: LX 4000 DAS-interface (Data Acquisition System) (Vista compatible). The system for data acquisition/reception LX4000 is designed to have 7 entrance channels and is actually an interface between the computer and the polygraphs accessories which register the modifications of the physiological parameters of the subject during testing.

The results are obtained from the following traditional physiological parameters:

- Lungs (PNEUMO) - Two input channels for breathing;
- EDA (electro-dermal activity) - galvanic skin response;
- CARDIO - heart rate.

To these traditional parameters we add additional sensors for measuring blood volume, pulse (PLE-PLETHISMOGRAPH) and countermeasures and motion sensors.

**Research methodology:** 30 selected subjects are tested in different conditions. One group will be determined to lie and the other to tell the truth. There will be used one recording system where the recorded data will be statistically processed using utilitarian Data Analyze from Excel.

**Conclusions:** The polygraph is a system used for detection of the simulated behaviour. Such an instrument is wide scale used in field where the hidden truth needs to be discovered for the assurance of a social balance. The technical development and the evolution to an assisted interpretation make of the polygraph a very friendly to use instrument.

**O.3.22.**  
**FUSION INFORMATION FOR BEHAVIOURS  
ANALYSIS**

**D. Simian\*, D.R. Fabian**

*Department of Mathematics and Informatics, University “Lucian Blaga” of  
Sibiu, Sibiu, Romania*

*\*Research Center on Informatics and Information Technology  
dana.simian@ulbsibiu.ro*

The aim of this paper is to propose architecture for systems meant to carry out behavioural analysis or monitoring of individual subjects in partially sensorial covered areas. The approach is mainly based on: a) well established methods and algorithms from data stream specific domains b) information fusion as support for decision making and reinforcement learning, c) human computer interaction for proper event assessment and fine tuning autonomous or supervised decision making. We proposed an agent oriented architecture for high-level fusion. Our system is built on several abstraction levels. In the subjects' area fields there are many sources which are responsible for providing input data. The sources can be sensors or other pre-processed datasets (i.e. databases or any kind of other input). Each layer has its own task specific handling chain consisting of several intermediate processing steps/levels, starting from source processing (as low level) to contextual descriptions (as high level). Different types of information (audio, video, IMU, etc) are subject to information fusion process. The original part of our system mainly consists in the design and organization of the last level, the higher one that is the Decision Part, based on artificial intelligence techniques. The focus on decision-making is to challenge sensitivity of detection without increasing the alert rate by means of techniques for qualitative information versus quantitative data analyses. As main mechanism for decision tuning/learning we consider human computer interaction and valuable resource for reinforcement learning.

### **O.3.23.**

## **EXPERIENCE OF IMPLEMENTING TELEMEDICINE IN PROFESSIONAL COMMUNICATION AND OF SIMULATION IN POSTGRADUATE EDUCATION IN PERINATAL MEDICINE SYSTEM IN REPUBLIC OF MOLDOVA**

**V. Friptu\* , A. Curteanu**

*State University of Medicine and Pharmacy "Nicolae Testemitanu",  
Chisinau, Republic Moldova  
friptu@hotmail.ru*

The implementation of the telemedicine is approved by the Health Minister order no. 285 from 18.08.2009 "About the implementation of the consultative telemedical system in perinatology centers" in four pilot centers: IMSP ICSOSMandC (level 3), CP Hospital no. 1 from the city of Chisinau, CP Balti and CP Cahul and another eight CP (level 2). In this way creating and developing the interdisciplinary network of telediagnosis aimed to improve the quality of the medical services, to decrease the cost of medical exams and to improve the quality of life.

The IMSP IMandC telemedicine system, a level 3 center from the regional perinatological system, has three purposes:

- The medical exam of the severe neonatal and obstetrical cases from all the ten centers from the level two, on an Ipath platform (provided by Switzerland), where cases are presented in a short and narrative way, and where is possible to show the baby on the notebook by web cam.
- Thanks to the teleexams of the patients from the level two centers, especially from Balti Center, there was a 30% decrease in transferring these patients in a level three center
- Another benefit is the "teleradiology" compartment, which involved describing of the radiology scans by the radiologist from a level three center.

Over 2012 there were examined 159 both obstetrical and neonatal cases on this platform. From all cases the diagnosis was confirmed in 92%, the treatment was confirmed in 94% and the medication was confirmed in 95%. In addition images from the radiology scans and USG were analysed. A positive role could also be the fact that the education of the physicians could be made from distance.

**P.3.1.**  
**DESIGN, MODELING AND SIMULATION OF MEMS  
PIEZOELECTRIC ENERGY HARVESTER FOR  
BIOMEDICAL IMPLANTS**

**A. Anghelescu<sup>\*</sup>, B. Fîrtat, C. Moldovan, S. Dinulescu**

*Institute of Microtechnology Bucharest, Voluntari, Ilfov, Romania  
Adrian.Anghelescu@imt.ro*

Powering pacemakers from heartbeat vibrations using MEMS(micro-electro-mechanical systems) piezoelectric energy harvesters is a modern development in the trend of miniaturization process of medical implantable devices. There is a need for a novel energy generator of small volume and long life energy.

Piezoelectric MEMS are introduced to replace the batteries of pacemakers by converting the heartbeats to electrical energy. Although the power requirements of a pacemaker are low, after a few years patients require another surgical operation just to replace their pacemaker battery.

In this study we present the design, modelling and simulation of MEMS piezoelectric harvester powering batteryless cardiac implants from heart vibrational energy.

The design of the MEMS piezoelectric energy harvester consists of finding the optimum geometry of a cantilever rectangular beam vibrating in a flexure mode(transversal  $d_{31}$ ) and the best sequence of layers(Si, poly-Si,  $Si_3N_4$ , ZnO, metal electrodes etc.) to build up the cantilever beam structure. We will apply a mechanical finite element simulation using COMSOL Multiphysics.

This paper presents the design modelling and simulation of the proposed MEMS piezoelectric energy harvester.

**P.3.2.**  
**BIOSENSOR BASED ON NANOSTRUCTURED  
SENSITIVE MATERIAL FOR THE DETECTION OF  
EPINEPHRINE AND NOREPINEPHRINE**

**I.M. Apetrei<sup>1</sup>, C. Apetrei<sup>2,\*</sup>, D. Tutunaru<sup>1</sup>**

<sup>1</sup>*Faculty of Medicine and Pharmacy, “Dunarea de Jos” University of  
Galati, Galati, Romania*

<sup>2</sup>*Faculty of Sciences and Environment, “Dunarea de Jos” University of  
Galati, Galati, Romania  
apetreic@ugal.ro*

Catecholamines (epinephrine and norepinephrine) are well-known such as heart failure biomarkers. The control of molecular organization is the main advantage of using Langmuir-Blodgett films in the development of biosensors. The enzymes preserve well biological activity in one biomimetic environment. The aim of this work was the developing of biosensors based on tyrosinase (Ty) immobilized in hybrid Langmuir films of arachidic acid (AA) and dysprosium (III) bisphthalocyanine (DyPc<sub>2</sub>). The Langmuir films of AA-DyPc<sub>2</sub>/Ty was transferred onto ITO electrodes and characterized by spectrometry and electrochemistry. The biocatalytic activity of Ty was maintained in the solid state, which allowed Ty-containing LB films to be used as highly sensitive material for biosensor detecting epinephrine and norepinephrine. Experimental conditions on the sensing performance of the biosensor were investigated. Linear responses were achieved up to 100 μM, with detection limits of 1.76×10<sup>-8</sup> M - 5.52×10<sup>-8</sup> M. The calculated Hill coefficients indicate cooperation of Ty with DyPc<sub>2</sub> that acts as a catalyst, also. The biosensor was successfully applied to determine trace amounts of epinephrine and norepinephrine from biological samples.

**Acknowledgments**

*This work was supported by a grant of the Romanian National Authority for Scientific Research, CNCS - UEFISCDI, project number PN-II-ID-PCE-2011-3-0255.*



**P.3.3.**  
**THE ROLE OF TELEMEDICINE IN THE DIAGNOSIS  
AND MONITORING OF PATIENTS WITH  
PERIODONTITIS**

**V. Badea, M. Grigorian\*, D.P. Balaban, A.R. Pavalache,  
A. Caraiane**

*Faculty of Dental Medicine, Ovidius University of Constanta, Constanta,  
Romania  
mirceagrigorian@yahoo.com*

**Introduction:** Periodontitis is the most common human infectious disease that requires early diagnosis and the monitoring of the treatment, given that, unchecked, it can lead to irreversible loss of tooth.

**Objective:** Our study proposes the use of telemedicine in the diagnosis and monitoring of patients with periodontitis, which are distant from a dental center with appropriate facilities needed to achieve a correct diagnosis.

**Material and methods:** Patients with presumptive diagnosis of periodontal disease (probing depth of 4 mm) were harvested periodontal pus samples, which were send in special transport mediums to the microbiology laboratory, where we identified periodontopathogenic bacterial species by the API system - a miniaturized version of conventional tests that is used for the bacteria species identification. Analysis reports were scanned and emailed to their dentist.

**Results:** Were examined samples from 10 patients with suspicion of periodontitis and there were identified the following bacterial species: *Aggregatibacter actinomycetemcomitans* in 2 samples and combinations of *Prevotella intermedia* and *Prophyromonas gingivalis* at 5, respectively *Prevotella intermedia* and *Tannerella forsythia* at 3 patients.

**Conclusions:** Results transmitted to the dentist through telemedicine allowed rapid achievement of treatment scheme for the investigated patients.

**P.3.4.**  
**PRELIMINARY STUDY CONCERNING SALIVARY  
NICKEL AND CHROMIUM LEVELS IN PATIENTS  
WITH METAL RESTORATIONS**

**D.P. Balaban<sup>1\*</sup>, A. Caraiane<sup>1</sup>, C. Dina<sup>2,3</sup>, M. Ion<sup>3</sup>, M. Dinisov<sup>3</sup>, V.  
Badea<sup>1</sup>, M. Grigorian<sup>1</sup>, F. Busuricu<sup>4</sup>, A. Popescu<sup>4</sup>**

<sup>1</sup> *Faculty of Dental Medicine, Ovidius University of Constanta, Romania*

<sup>2</sup> *Faculty of Medicine, Ovidius University of Constanta, Romania*

<sup>3</sup> *Direction of Public Health Constanta, Romania*

<sup>4</sup> *Faculty of Pharmacy, Ovidius University of Constanta, Romania  
dpbalaban@yahoo.com*

Several studies have demonstrated the corrosion of dental alloys. The researchers found correspondence between the components of the alloys and the metal content of saliva.

The aim of this study was to determine salivary nickel and chromium concentrations levels in patients with metal restorations, during different period.

Fifteen persons were included in this study and divided in three groups: control group (n=5), first study group (n=5) and second study group (n=5). First group included persons with metal restorations for no less than 3 years and second group included persons with restorations for more than 3 years. Non-stimulated saliva samples were collected. Salivary nickel and chromium concentrations levels were determined using atomic absorption spectroscopy (AAS).

The results obtained in this study demonstrated than the alloy components can be found in saliva. Average value of salivary metals was higher for both study groups versus control group. Mean values of salivary nickel and chromium concentrations levels were higher for first study group versus the second one. Decrease in salivary nickel and chromium concentrations levels was caused by to the formation of a metal oxide protective coating on the surface of metal restorations.

**P.3.5.**

**RESPIRATORY ALLERGENS - EXPERIMENTAL  
DETECTION, KNOWLEDGE AND PREVALENCE**

**M. Simon, M. Moga, M. Buzescu, M. Badea\***

*Faculty of Medicine, Transilvania University Brasov, Romania  
mihaela.badea@unitbv.ro*

The purpose of this work is to highlight awareness about allergies and respiratory problems that nurses have to take care in allergic rhinitis.

Based on the data found in scientific literature in the field of allergic rhinitis, there were created and administered questionnaires about general data about respiratory allergies and allergic rhinitis in particular. There were noted the need to involve health care through participation in specific diagnostic tests and specific laboratory testing.

The problem of respiratory allergies was collected from a private clinic in Brasov during Nov. 2012-Nov. 2013. The obtained data were statistically analyzed and compared are performed.

By specific testing of each person, the doctor can recommend personalized management treatment later.

**Acknowledgments**

*This work was supported by a grant of the Transilvania University of Brasov, Romania for young students, in order to sustain their graduation thesis.*

**P.3.6.**  
**ROLE OF TELEMEDICINE IN SCARLET FEVER  
PROPHYLAXIS**

**M.E. Cocuz<sup>1\*</sup>, I.G. Cocuz<sup>2</sup>**

<sup>1</sup> *Faculty of Medicine, Transilvania University Brasov, Romania*

<sup>2</sup> *Faculty of Medicine, University of Medicine and Pharmacy*

*Targu Mures, Romania*

*maria\_elenacocuz@yahoo.com*

Scarlet fever, infectious disease caused by streptococci beta-hemolytic group A, with highest incidence in children and children communities such kindergartens/schools, may cause severe complications in the absence of early treatment (rheumatic fever, glomerulonephritis, etc).The children who have direct contact with a case of scarlet fever must receive antibiotics prophylaxis immediately to prevent child illness.

The paper is a possible guide for computer assistance in speeding up the process of making antibiotic prophylaxis in kindergartens / schools when a case of scarlet fever appears. In other words there should be software which is connected via internet with every school/kindergarten and with every hospital from that county. This software equals to a live updated county data-base where every case of scarlet fever is announced in real time and early treatment can be started in minutes to reduce the rate of infection.

For proving we have done a retrospective study on the patient admitted for scarlet fever in Infectious Diseases Hospital of Brasov between years 2007-2013. We have found that in this period there were admitted 1314 patients with scarlet fever. The majority (97,10%) of this patients were children and 1100 (86,21%) were attending kindergarten or schools. This persistent morbidity by scarlet fever requires further sustained activity to detect sources of infection, isolation, their proper handling and application of effective antibiotic prophylaxis in contacts of patients with this infectious disease.

### **P.3.7.**

## **SIGNALING MOLECULES PROFILES IN CAVEOLIN-1 TRANSGENIC MICE**

**E. Codrici\*, I.D. Popescu, S. Mihai, R. Albuлесcu, C. Tanase**

*Victor Babes National Institute of Pathology, Bucharest, Romania  
bioch@vbabes.ro*

Caveolin-1 is the principal structural protein of caveolae membranes. A caveolin-1 null (CAV-1  $-/-$ ) mouse model was created, to assess the role of caveolin-1 in caveolae biogenesis, endocytosis, cell proliferation, signaling pathways and other molecular mechanisms of diseases.

Cell lysates were obtained from tissues (pancreas, heart, small intestine) from transgenic mice Cav-1 $^{-/-}$  (Cav-1 KO: Cav1<sup>tm1Mls/J</sup>) and Cav-1 $^{+/+}$  (B6129PF2/J) as control. Signaling pattern was performed on cell lysates using MILLIPLEX MAP 8-Plex Multi-Pathway Signaling Kit. Analysis were performed on Luminex® 200™.

An increased expression of pErk/MAPK  $\frac{1}{2}$  ( $p < 0.05$ ), p-p70S6K ( $p < 0.05$ ), pI $\kappa$ B ( $p = 0.01$ ) and p-p38 ( $p < 0.05$ ) in pancreatic tissue from caveolin-1 transgenic mice *versus* control was noticed. An increased activity of signaling molecules p-p70S6K ( $p < 0.05$ ), pI $\kappa$ B ( $p < 0.05$ ), pStat5/B ( $p = 0.07$ ) and p-p38 ( $p = 0.1$ ) was found in small intestine lysates from transgenic mice compared with control. In the case of heart tissue lysate were revealed differences between pErk/MAPK  $\frac{1}{2}$  ( $p = 0.01$ ), p-p70S6K ( $p < 0.05$ ) and p-p38 ( $p = 0.1$ ).

The monitoring of signalling molecules profile in caveolin-1 transgenic mice, may allow us to understand the involvement of these mutations in the molecular mechanisms of cell biology. Further studies will be necessary on larger groups for a complex characterization of these mechanisms.

### **Acknowledgement**

*This paper is partly supported by the Sectorial Operational Programme Human Resources Development (SOPHRD), financed by the European Social Fund and the Romanian Government under the contract number POSDRU 141531.*

*The project was supported by PN 09.33-04.15 and PN 09.33-03.10.*

**P.3.8.**

**INFLUENCE OF ENVIRONMENTAL FACTORS ON  
THE TRANSMISSION OF THE H. PYLORI INFECTION**

**E.M. Constantinescu<sup>\*</sup>, C.A. Constantinescu**

*Faculty of Medicine, Transilvania University of Brasov, Brasov, Romania  
dr\_mihaelaconstantinescu@yahoo.com*

H pylori is found in the gastric mucosa in two-thirds of the world population, as compared to the social economic status (SES), existing a clear relationship between the presence of H. pylori in the gastric mucosa and the development of digestive diseases

Multiple transmission paths are suspected, the most frequently mentioned are the oral-oral, fecal-oral, gastro-oral, iatrogenic, and zoonotic. Human is the main reservoir in nature.

*Helicobacter pylori* DNA was identified in uncontrolled water sources (outside the public distribution network) and in wastewater.

### **P.3.9.**

## **THE MAIN TYPES OF BIRTH DEFECTS OF THE LIP AND PSYCHOSOCIAL IMPACT**

**E. D m aru<sup>1\*</sup>, I. Bordeianu<sup>2</sup>, C. Nicolae<sup>1</sup>, C. Pu ca u<sup>1</sup>,  
D.P. Balaban<sup>1</sup>, A. Caraiane<sup>1</sup>**

<sup>1</sup>*Faculty of Dental Medicine, "Ovidius" University, Constanta, Romania*

<sup>2</sup>*Faculty of Medicine, "Ovidius" University, Constanta, Romania*

*damasaruelena@yahoo.com*

Labio-maxillo-palatine cleft (known as "cleft lip" and "mouth of the wolf") is characterized by congenital interruption in the continuity of the upper lip, upper alveolar process, hard palate or soft palate.

The present work analyzed the medical scientific papers, in which there have been elucidated the epidemiology, etiology, clinical anatomical forms of cleft lip and psychosocial impact on patients with these congenital anomalies.

The findings have shown us the importance of knowing the clinical anatomical forms of cleft lip. In the reported racial groups, the incidence is 1/800-1000 births in whites, 1/2500 for the black race, while the oriental race breeds the most cases (1.7%). Depending on the extent and location of the cleft, it can be: one-sided in 70% of cases and associated bilaterally with 20% cleft palate in 70% of cases. Cleft lip is more common in males than in the females. The issue of medical recovery of patients with cleft lip requires identifying new and effective methods of treatment.

**P.3.10.**  
**TELEMEDICINE: APPLICATIONS IN CLINICAL  
PHARMACOLOGY, IMPACT ON TREATMENT  
ADHERENCE**

**L. Dima<sup>\*</sup>, L. Rogozea, M. Moga, M. Badea**

*Faculty of Medicine, Transilvania University of Brasov, Brasov, Romania  
lorena.dima@unitbv.ro*

Regularly intake of treatment drugs as indicated (treatment adherence) is an important prerequisite of successful therapy. Finding ways of improving treatment adherence is essential for better health outcomes and for lowering costs. Numerous interventions utilize innovative technology to support programmes promoting treatment adherence. Technology has a high potential of improving interventions to promote treatment adherence, but many health information technologies enabled interventions are utilised presently without enough evidence on their impact. How to best choose from various types of interventions in particular therapeutic situations is less clear.

The aim of present work was to review methods, systems, tools and technologies used to investigate and promote treatment adherence and existing evidence related to their impact in various clinical situations. Each type of intervention and each technological tool have specific advantages and disadvantages. Understanding these aspects is essential for clinicians and researchers in designing and recommending programs to promote treatment adherence tailored to the needs of individual patients.



### **P.3.11.**

## **CHANGES IN STRUCTURE AND FUNCTION OF GLUTATHIONE S-TRANSFERASE BY GLYCATION**

**J. Dršata, I. Boušová\* , L. Trnková, L. Srbová, Z. Pr chová**

*Dept of Biochemical Sciences, Faculty of Pharmacy, Charles University, Hradec  
Králové, Czech Republic  
Iva.Bousova@faf.cuni.cz*

The chemical process of glycation is resulting in the impairment of protein structure and function. Beside the known glycation of hemoglobin, which has been used for years for laboratory monitoring of diabetic patients, non-enzymatic glycation is responsible for structural and functional changes of many other proteins that are connected with *diabetes mellitus* complications. During glycation process, reactive alpha-dicarbonyl compounds (e.g. methylglyoxal) and advanced glycation end products (AGEs) are formed. Alpha-dicarbonyls cause protein cross-linking and formation of AGEs mainly on intracellular proteins, which usually lose their biological activity and may persist in tissues. Among proteins, also biotransformation enzymes might be influenced by glycation.

Glutathione S-transferases (GST, EC 2.5.1.18), group of intracellular enzymes involved in detoxification of xenobiotics, belong to the most abundant cytosolic proteins. We suppose that GST may be modified by glycation *in vivo*, which would provide a rationale of its use as a model protein for studying glycation reactions. Glycation of GST by methylglyoxal, fructose or glucose was studied (37°C, for up to 28 days). The course of protein glycation was evaluated using following criteria: enzyme activity, formation of fluorescent AGEs, amino group's content, protein conformation, cross-linking and aggregation, carbonyl content, and changes in molecular charge of GST. The ongoing glycation by methylglyoxal 2 mM resulted in pronounced loss of GST enzymatic activity. It also led to the loss of 14 primary amino groups, which was accompanied by changes in protein mobility during native PAGE. Formation of cross-links with molecular weight of 65 and 135 kDa was observed. Obtained results can contribute to understanding of changes, which proceed in metabolism of xenobiotics during diabetes mellitus and ageing.

### **Acknowledgments**

*This study was realized with financial support from the Research Project SVV 260065 (Charles University in Prague).*

**P.3.12.**

**DETECTION OF SULPHUR COMPOUNDS USING  
THEIR ELECTROCHEMICAL PROPERTIES**

**C. Faraian, L. Chelmea, M. Moga, Gh. Coman, M. Badea\***

*Faculty of Medicine, Transilvania University Brasov, Brasov, Romania  
mihaela.badea@unitbv.ro*

The presence of sulphur in different molecules determines them different properties, depending on the functional group that contains them.

Using electrochemical methods there were tested different behaviours of some sulphur compounds: cysteine, thiourea, and N-acetyl cysteine.

It has been studied and optimized electrochemical analysis methods for cysteine, thiourea and N-acetyl cysteine using screen-printed electrodes.

The results have shown different possibilities of detection for the studied compounds and this fact offers an advantage for their detection in real samples.

**P.3.13.**  
**TELERADIOLOGY CONTRIBUTION IN STAGING  
AND MONITORING OF LUNG TUMORS**

**A. Fleancu, G. Sechel\***

*Faculty of Medicine, Transilvania University of Brasov, Brasov, Romania  
gabisechel@yahoo.com*

**Objectives:** The purpose of this paper is the contribution of imagistic methods in the staging and monitoring of lung tumors as well as highlighting the importance of teleradiology in collaboration with the oncologic treatment.

**Material and methods:** The study is a retrospective, assessing a group of 4128 patients investigated for chest pathology Hospital and Polyclinic PDR Medlife Bra ov, in a period of two years (2010-2012) using the method of chest X-ray and computer tomography (CT). Scans were performed using a Siemens SOMATOM Emotion 6 CT system, CT multislice spiral acquisition and applications: ThoraxRoutine, ThoraxCombi, ThoraxHR, ThoraxHRSeq and LungCARE.

**Results and conclusions:** Replacement of pulmonary lesions space was evident at approximately 6% of patients in the study group of which one third were malignant.

Lung tumors were found chiefly in males (65%) and the age group most affected was between 51 - 60 years (29%). Cases distribution by stage was: stage I - 4%, stage II – 8%, stage III - 53%, stage IV - 35%; majority of lung tumor pathology that was discovered in stages III and IV has the causality failure patients on regular examinations or late presentation.

Therapy cases that were CT monitored have revealed that favorable development was present in 20% of the patients, who are especially in stages I-II. For about 60% of patients with tumors can say that evolution was stationary at the end of the study, and about 20% have developed unfavorable outcome. Using teleradiology facilitated a proper monitoring of patients.

**P.3.14.**

**RISK ASSESSMENT IN INTRAHOSPITAL PATIENTS  
TRANSPORTATION**

**R. Szuhaneck<sup>1\*</sup>, A. Pana<sup>2</sup>, M. Moga<sup>2</sup>, L. Floroian<sup>2</sup>**

<sup>1</sup> *Politehnica University Timisoara, Timisoara, Romania*

<sup>2</sup> *Transilvania University of Brasov, Brasov, Romania  
rankic\_s@yahoo.com*

This work is a review on the current literature of the intrahospital transport of critically ill patients and it refer to type and incidence of adverse effects, risk factors and risk assessment, and also to the available information on efficiency and cost-effectiveness of transferring such patients for diagnostic or therapeutic interventions within hospital. Methods and guidelines to prevent or reduce potential hazards and complications are provided.

Adverse effects may occur in up to 70% of transports. They include a change in heart rate, arterial hypotension and hypertension, increased intracranial pressure, arrhythmias, cardiac arrest and a change in respiratory rate, hypocapnia and hypercapnia, and significant hypoxaemia. No transport-related deaths have been reported. In up to one-third of cases the mishaps during transport were equipment related. Transports for diagnostic procedures resulted in a change in patient management in 40–50% of cases, indicating a good risk-benefit ratio.

**P.3.15.**  
**PREGNANCY ASSOCIATED OXIDATIVE STRESS-  
RURAL/URBAN AREA DIFFERENCES**

**L. Gaman<sup>1,2</sup>, D.Lixandru<sup>1</sup>, M. Gilca<sup>1,2</sup>, V.Atanasiu<sup>1</sup>, C. Muscurel<sup>1</sup>,  
I. Stoian<sup>1,2\*</sup>**

<sup>1</sup> *Biochemistry Department, University of Medicine and Pharmacy Carol  
Davila, Bucharest, Romania*

<sup>2</sup> *R&D Irist Labmed, Bucharest, Romania  
irina\_stoian64@yahoo.com*

Environmental pollution can generate increased oxidative stress. Rural and urban pollution sources are quite different and their influence on oxidative stress parameters should also be different. Placental tissue concentrations of oxidative stress markers and antioxidant defence systems may be an useful indicator of maternal and also fetal exposure to environmental pollution.

In order to evaluate the influence of urban and rural pollution on placental antioxidant systems we have recruited 200 pregnant women in Bucharest (urban) and Giurgiu (rural) areas- 100 for each region. On placental tissue collected after term birth we have evaluated the activities of glutathione transferase (GST), glutathione reductase (GRed), superoxide dismutase (SOD), catalase (CAT) and the concentrations of total and non proteic thiol groups (SH<sub>tot</sub> and SH<sub>nonpr</sub>).

Total and nonproteic thiol groups were significantly higher in rural area (Giurgiu) while the activities of GST and GRed were significantly higher in urban area (Bucharest). No significant differences were noted between the activities of SOD and CAT.

Our results show differences between the two areas in terms of antioxidant systems activated and may be explained by the differences in pollution related oxidative stress systems activation.

**P.3.16.**

**TELEMEDICINE: A WAY FOR PSYCHOLOGICAL INTERVENTIONS TO THE MEDICAL STAFF WITH THE BURN-OUT SYNDROME?**

**S. Grigorescu<sup>\*</sup>, D.O. Grigorescu**

*Transilvania University Brasov, Brasov, Romania  
simo.grigorescu@yahoo.com*

**Introduction.** The burn-out syndrome is a mental condition defined as a result of continuous and long-term stress exposure, particularly related to psychosocial factors of work. This syndrome has consequences at a personal level, but has tendency to spread from one to another member of a team, from the team to the patients, affecting finally the whole structure in which works the initially affected team member.

**The aim of the study.** To design a proper way to investigate if telemedicine could: a) become a way by which psychological interventions can be provided for the medical staff with burn-out syndrome; b) create the therapeutic alliance occurred in the psychotherapeutic approach; c) provide good quality information for the management staff related to the burn-out syndrome causes.

**Material and method.** The subjects of the study are included in the medical staff (physicians, nurses) at risk of burn-out syndrome, which, usually are unknown by lack of diagnosis. To help them, it is necessary at the first beginning to identify the subjects with burn-out syndrome by applying the Maslach Burn-out Inventory (MBI) questionnaire. After that, it will be applied an original questionnaire especially designed by the authors in order to find out if the subjects agree to be approached and treated by telemedicine methods and if they consider these methods to be an advantage or disadvantage for the cure of the syndrome and for the relationship between the members of the medical staff and the management of the medical unit.

**Conclusions.** Psychological interventions offered by telemedicine could ensure better security and privacy of information, especially in the situation of group therapy. Monitoring by telemedicine could become an effective strategy for controlling the burn-out syndrome and identifying useful solutions to solve the problems for both subjects and medical unit leadership.

**P.3.17.**

**TELEMEDICINE BY USING SPIROMETRY - AN  
USEFULL TOOL FOR EXPLORATION OF THE  
RESPIRATORY SYSTEM**

**M. Grigorian\*, V. Badea, D.P. Balaban, F.C. Badea, A. Caraiane**

*Faculty of Dental Medicine, Ovidius University of Constanta, Constanta,  
Romania  
mirceagrigorian@yahoo.com*

**Introduction:** The development of electronic communications is present also in medicine where they become part of the relation between patient and doctor. Telespirometry is an example of using telemedicine for the surveillance of the patients with respiratory diseases, including home-based clinical diagnosis and monitoring by the specialists.

**Objective:** The aim of the study was to evaluate the use telespirometry in evaluation of the respiratory function at patients from rural areas.

**Material and methods:** We selected in the study patients with presumptive diagnosis of chronic obstructive pulmonary disease (COPD), asthma or emphysema, which were assessed by using spirometry - Spirobank II - and the values obtained were emailed to the pneumologist.

**Results:** In the 20 patients evaluated by spirometry, this test confirmed, in corroboration with other explorations performed to the patients, the diagnosis of COPD in 60%, 10% with asthma, emphysema in 15% and in 15% of cases the values obtained were normal, excluding a respiratory pathology.

**Conclusion:** Our study sustains the fact that spirometry can be an useful tool for telepneumology because we obtain a quick diagnosis from a specialist, saving a lot of resources both from patients and also from the health system.

**P.3.18.**  
**SALIVARY BIOMARKERS FOR CLINICAL  
APPLICATION**

**E. Lazar<sup>1</sup>, A. Nicolau<sup>1</sup>, D.P. Balaban<sup>2</sup>, M. Moga<sup>1</sup>, M. Badea<sup>1\*</sup>**

<sup>1</sup> *Faculty of Medicine, Transilvania University of Brasov, Brasov, Romania*

<sup>2</sup> *Faculty of Medical Dentistry, Ovidius University, Constanta, Romania*  
*mihaela.badea@unitbv.ro*

For preventive aim and early diagnosis of different systemic diseases, the analyses of some of the inflammatory biomarkers in saliva are used.

Chromatography, immunochemical assay, rapid tests, sensors and biosensors are used successfully in order to fulfil this aim.

The work indicates some of the biomarkers used as potential tools for screening purposes in epidemiological and clinical studies.



**P.3.19.**  
**SYNTHETIC PHTHALOCYANINES FOR  
EXPERIMENTAL PHOTODYNAMIC THERAPY OF  
DYSPLASTIC KERATINOCYTES - A PROTEOMIC  
EVALUATION OF APOPTOSIS**

**C. Constantin<sup>1</sup>, C. Matei<sup>2</sup>, M. Tampa<sup>2</sup>, R-M Ion<sup>3</sup>, M. Neagu<sup>1</sup>**

<sup>1</sup> *“Victor Babes” National Institute of Pathology, Immunobiology  
Laboratory, Bucharest, Romania*

<sup>2</sup> *Dermatology Department, “Carol Davila” University of Medicine and  
Pharmacy, Bucharest, Romania*

<sup>3</sup> *The National Institute for Research & Development in Chemistry and  
Petrochemistry, Bucharest, Romania  
caroconstantin@gmail.com*

Photodynamic therapy (PDT) is an alternative treatment of mucocutaneous tumors that uses a light source able to activate a photosensitizer destroying tumoral cells mainly by induction of apoptosis. The aluminium-substituted disulphonated phthalocyanines display a good photosensitizing potential but up to date, the intimate molecular apoptotic mechanisms activated by PDT with this type of phthalocyanine in dysplastic human oral keratinocytes are not completely elucidated. Protein microarray technology could be an excellent proteomic tool for apoptosis quantification post-PDT. We evaluate apoptotic cell death following PDT in dysplastic oral keratinocytes cell line (DOK) treated with aluminium di-sulphonated phthalocyanines exploiting a proteomic array platform for simultaneously detection of 155 proteins involved in apoptosis. Alteration of the most important proteins in cells subjected to PDT studied with the chosen array platform comprises mainly Bcl-2, P70S6K, Raf-1 and Bad proteins. Using this proteomic array approach a better understanding of tumor cell death upon PDT can be obtained, by revealing apoptotic molecules as potential new targets for future anti-tumoral therapies.

**Acknowledgments**

*The study was financed by the Research Projects PN-II-ID-PCE-2011-3-0918 and PN. 09.33-01.01.*

**P.3.20.**  
**STUDY REGARDING ORAL DENTAL IMPAIRMENT  
IN PATIENTS WITH DIABETES IN CONSTANTA  
COUNTY**

**E-E. achir<sup>1\*</sup>, D. Catrinou<sup>2</sup>, M. Grigorian<sup>1</sup>, V. Badea<sup>1</sup>**

<sup>1</sup> *Faculty of Dental Medicine, Ovidius University from Constanta, Romania*

<sup>2</sup> *Faculty of Medicine, Ovidius University from Constanta, Romania  
erdogan\_sachir@yahoo.com*

**Objective:** Our study aims to assess oro-dental health on patients with diabetes mellitus (DM) with different levels of metabolic balance.

**Methods:** The study was conducted in the Department of Diabetes, Nutrition and Metabolic Diseases of the Constanta County Emergency Hospital, with the approval and support of the Ethics Commission, on a sample of 110 individuals with DM (58 male, 52 female) aged between 30 and 45. To assess the oro-dental health DMFT index (expresses the total number of decayed, missing cause cavities and filled teeth) was used and to establish the metabolic balance, value of glycosylated hemoglobin (HbA1c) was determined.

**Results:** Following the assessments made were confined two groups: the first includes unbalanced diabetics and it is consists of 61 patients with HbA1c > 8% with a mean DMFT index of 15.49, compared to the second group with metabolically balanced diabetics and it is consists of 49 patients with HbA1c ≤ 8, where the average value of DMFT index was 7.59.

**Conclusions:** The study shows that metabolic imbalances generates serious disturbances of the body's defense systems, disturbances reflected also in the oral cavity by increasing destruction of the teeth, thereby may be established early schemes of treatment for unbalanced diabetics to prevent and improve oro-dental status.

**P.3.21.**

**NATURAL ALIMENTATION AND CONSTIPATION**

**F. Sav, B. Popovici, M. Badea \***

*Faculty of Medicine, Transilvania University of Brasov, Brasov, Romania  
mihaela.badea@unitbv.ro*

Based on the development of phytochemistry, biochemistry, pharmacodynamics and modern pharmaceutical technology, herbal medicine today is a new branch of medicine growing and increasing. However, it is necessary to specify that herbal medicine should not be understood as exclusive practice.

Constipation is a major health problem, especially in certain patient groups, such as children and the elderly, but in most cases, constipation is not life threatening and can be treated by a doctor.

Constipation is becoming both more common in infants, and especially in older children, often the consequence of an unbalanced diet low in dietary fibre, fruits and vegetables. Common causes lie on excess milk, especially after 6 months. More rarely, they are certain organic diseases (abnormalities, endocrine, metabolic, etc.) that have a resounding the entire body with signs and symptoms suggestive. Among the most frequent predisposing factors include: family history of constipation, errors in the diet, psycho-emotional factors and socio-educational.

This paper aims to highlight the situation of constipation among children in Brasov (January 2010-November 2013).

The level of knowledge about the beneficial and adverse effects of dietary supplements in the treatment of constipation was studied using two different population groups: young (18-29 students) and elderly (people aged over 50 years).

**P.3.22.**

**THE CONTRIBUTION OF TELERADIOLOGY AND  
IMAGISTIC METHODS IN THE EVALUATION OF  
DIMENSIONAL AND STRUCTURAL CHANGES OF  
THE SPLEEN**

**G. Sechel<sup>\*</sup>, A. Fleancu**

*Faculty of Medicine, Transilvania University of Brasov, Brasov, Romania  
gabisechel@yahoo.com*

**Objectives:** This paper aims to assess the imagistic aspect (ultrasound and CT scan) of splenic lesions and abnormalities, as well as highlighting the importance of teleradiology in the evaluation of patients presenting these pathologies.

**Material and methods:** The study is retrospective and uses observing data from patient charts.

We analyzed a sample of 1947 patients admitted to the departments of Clinical Surgery and Hematology Hospital Brasov County Emergency and Hospital Medlife Brasov for various pathologies, from January to December 2013. The imagistic methods that were used are ultrasonography and computed tomography.

**Results and conclusions:** The cases studied showed that 5% had splenic pathology of which 91% and 9% nontraumatic injury. Types of nontraumatic splenic lesions discovered are in descending order as follows: splenomegaly, congenital anomalies, calcification, lymphoproliferative and myeloproliferative syndromes specific injuries chronic, infarcts, cysts, lesions of primary and secondary tumors. Abdominal trauma was highlighted in surgery at a rate of 48%, of which 26% were associated with rupture of the spleen.

The use of teleradiology proved especially effective in cases of emergency surgery and hematologic monitoring etiology of splenic pathology.

**P.3.23.**

**RESEARCH ON THE BENEFITS OF SEA BUCKTHORN  
PRODUCTS**

**T. Seculin, M. Buzescu, M. Badea\***

*Faculty of Medicine, Transilvania University of Brasov, Brasov, Romania  
mihaela.badea@unitbv.ro*

The chemical composition of the sea buckthorn (also known as *Hippophae rhamnoides*) indicates: carotenoids (beta - carotene, lycopene), flavonoids (quercetin), water and fat-soluble vitamins (vitamin B1, B2, C, E), phytosterols and mineral substances.

Scientific studies indicated some of the beneficial effects of the sea buckthorn as: bactericide, immunostimulant, anti-inflammatory, skin regenerator and antiplatelet.

The study was carried out on two types of population (students and adults) by analyzing their level of information regarding the sea buckthorn products, their possible use, the benefit area.

The complexity of the effects of this plant requires a rigorous scientific research in order to be able to extend its large-scale use for physiological and health improving effects.

### **P.3.24.**

## **MINI-INCUBATOR FOR CELL CULTURE GROWTH**

**I. Stan\* , C.Moldovan, N.Codreanu**

*Electech Research & Consulting Srl  
stan.ion2007@gmail.com*

The paper will present the design and implementation of a **microfluidic platform** able to deliver the needed nutrients for the **cell culture nutrition** and **growth** or insertion of different analytes (toxicants or others) together with a microsensor chip able to monitor the impedance of the cell culture. The mini-incubator keeping the temperature The design of the microfluidic platform is taking into consideration the possibility to deliver to the cell culture six different liquides. The liquides placed in six reservoirs are delivered using six micropumps working independently. The liquides can be pumped one by one or mixed together according to the biological application protocol. The liquids are mixed together into a preparation vessel and after that sent to the miniincubator hosting the cell culture. The miniplatform allows the cell culture growing and 24/7 monitoring using data aquisition Labview based.

In the last two decades the replacement of animal studies by studies on cell cultures has been recommended more and more used. There are strong recommendations, at least at the European level, to use cell culture as a tool for investigation and simulation of organs, and beings' living conditions when exposed to external stimulation like chemicals electricity, radiation and others.

New tools and apparatus are needed for empowering biomedical research by offering increased functionality, high sensitivity, easy handling, user friendly interfaces and cost reduction. The paper work will bring new devices like the microfluidic platform including reservoirs, pumps, and preparation vessel. The miniincubator will be presented.

### **Acknowledgements**

*The paper work was supported by the POSCCE programme, Operation 2.3.1, contract number 395/1.08.2012*

**P.3.25.**

**VASCULAR CALCIFICATION IN CHRONIC KIDNEY  
DISEASE - PROTEOMIC CHALLENGES**

**S. Mihai<sup>1\*</sup>, E. Codrici<sup>1</sup>, I.D. Popescu<sup>1</sup>, C. Tanase<sup>1</sup>,  
R. Albuлесcu<sup>1</sup>, A. Nita<sup>1</sup>, E. Rusu<sup>2</sup>, M. Voiculescu<sup>2</sup>**

<sup>1</sup> *Victor Babes National Institute of Pathology, Bucharest, Romania*

<sup>2</sup> *Fundeni Clinical Institute, Bucharest, Romania  
bioch@vbabes.ro*

The progressive loss in kidney function over a period of month or years is characteristic for chronic kidney disease (CKD). Accelerated vascular calcification (VC) is an important and devastating complication of CKD and contributes to the high mortality in these patients.

Development of a novel biomarker panel particularly useful for identification of VC early phases in CKD patients is the aim of the present study. In order to identify the candidate biomarkers, 8 different molecules were simultaneously measured in 40 serum samples from CKD patients and 20 normal controls using the Luminex xMAP technology. Other 2 molecules were assessed by ELISA. Serum levels of bone-regulated molecules (OPG, OC, OPN) and factors actively involved in VC process (PTH, vitamin D, FGF-23 and fetuin A) showed various trends in CKD patients versus control. The pro-inflammatory cytokines level (TNF, IL-6) were modified in CKD patients compared with control ( $p < 0.05$ ), while for IL-1 no trend was visible so far.

Proteomics could offer new opportunities for VC early detection in CKD patients, thus would allow developing further strategies aiming to guide therapy and monitor the treatment. xMAP technology could be a useful proteomic tool, with applications in personalized medicine in CKD patients.

**Acknowledgments**

*The present work was supported by project PNII 93/02.07.2012 and PN 09.33-03.10.*

**P.3.26.**  
**ANTIOXIDANT ACTION OF CATALASE**

**M. Farraj<sup>1</sup>, N. Taus<sup>1\*</sup>, A. Mironescu<sup>1</sup>, R. Necula<sup>1</sup>, C. I. Rau ia<sup>1</sup>,  
L. Taus<sup>1</sup>, M. Boicu<sup>2</sup>, V. Necula<sup>1,2</sup>**

<sup>1</sup> *Transilvania University of Brasov, Brasov, Romania*

<sup>2</sup> *Sanitary –Veterinary and Food Safety Direction of Brasov, Brasov,  
Romania*

*nicoletataus@yahoo.com*

The aim of the study is to demonstrate if titanium pro-oxidative action, evidenced by the catalase enzyme activity, changes and if vitamin E given at a dose of 8 mg/kg have antioxidant action.

Experimental study was conducted on white Wistar mice aged 8 weeks from Brasov veterinary bio base Department and laboratory.

There have been used three groups: group 1 (control group) -without any administration of titanium dioxide or antioxidant drugs, group 2 - titanium dioxide was administered 5 mg/kg b.w., and group 3 - titanium dioxide was administered 5 mg/kg b.w., together with vitamin E (8 mg/kg body).

Titanium dioxide i.p. injected induced to all groups of white Wistar mice oxidative stress. For group 2 rats decreased antioxidant enzyme catalase activity, so that the average of the catalase activity of the group 2 (injected intra peritoneal with titanium) represents 46.7% compared to that of the witness group-group 1. For Group 3 of Wistar mice that were injected with titanium dioxide (5 mg/kg body) and vitamin E (8 mg/kg body), antioxidant enzyme catalase activity decreased, compared to the values of the witness group. The average activity of the enzyme catalase of group 3 is 86,78% of the average of the catalase activity in control group.

Compared to the average of the catalase activity in Group 2 of the mice inject with titanium, the activity of catalase of Group 3 is 1.97 times greater. In conclusion, titanium dioxide produces oxidative stress in the body revealed by variations of the catalase.



**P.3.27.**  
**ELECTROANALYTICAL DETECTION OF  
LIDOCAINE**

**N. Taus<sup>1\*</sup>, M. Badea<sup>1</sup>, A. D. Hirceaga<sup>1</sup>, R. Necula<sup>1</sup>, C. I. Rautia<sup>1</sup>,  
L. Taus<sup>1</sup>, M. Boicu<sup>2</sup>, V. Necula<sup>2</sup>**

<sup>1</sup>*Transilvania University of Brasov, Faculty of Medicine, Brasov, Romania*

<sup>2</sup>*Sanitary –Veterinary and Food Safety Direction of Brasov, Brasov,  
Romania  
nicoletataus@yahoo.com*

Sensors and biosensors are used in medical research, as a modern medical technique for monitoring active compounds. Electrochemical analysis has already been used in cocaine detection in street samples. In the present study, we used screen printed electrodes for detection of lidocaine.

Starting from these experiments we aim to develop electroanalytical methods for the detection of lidocaine in products with topical administration.

Sensors and biosensors represent measuring instruments easy to handle, with tips for the quantitative determination of a particular compound in various pharmaceuticals.

**P.3.28.**  
**INTERFERENCES ON SIMULTANEOUS  
ELECTROCHEMICAL DETECTION OF DOPAMINE,  
SEROTONIN AND ASCORBIC ACID**

**S. Chiperea<sup>1</sup>, S. Brescan<sup>1</sup>, V. Veregut<sup>1</sup>, J.L. Marty<sup>2</sup>, P. Restani<sup>3</sup>,  
M. Badea<sup>1\*</sup>**

<sup>1</sup> *Transilvania University of Brasov, Brasov, Romania*

<sup>2</sup> *University of Perpignan Via Domitia, Perpignan, France*

<sup>3</sup> *Università degli Studi di Milano, Italy*  
*mihaela.badea@unitbv.ro*

Dopamine is a neurotransmitter that is found ubiquitously in mammalian nervous tissue. Patients suffering from Parkinson's disease have low levels of dopamine in the brain. Serotonin is a neurotransmitter responsible for regulating sleep, mood, and anxiety in mammals, and alcoholism in humans, with important antioxidant properties. Importance of ascorbic acid (vitamin C) in multiple biological processes, and its use in recent years as the active ingredient in pesticides has led a number of researchers to discover new methods for faster and more sensitive detection.

Simultaneous measurements of dopamine, serotonin and vitamin C are important because that they often occur together in different systems.

To detect biologically active species were studied several electrochemical methods. Differential pulse voltammetry (DPV) was chosen as the best and fastest method of detection for dopamine, serotonin and ascorbic acid. We studied several possibilities detection using DPV at different values of pH 7, 7.4 and 5.8 (phosphate buffer).

The compounds were studied separately (standard samples) and calibration curves were obtained. We have studied mixtures of two or three substances studying the interference due to the simultaneous presence of two or three analytes.

According to electrochemical studies, it can recommend new methods, rapid and sensitive detection of dopamine, serotonin and ascorbic acid.

**P.3.29.**

**ANALYSIS OF CLINICAL STATE AND BASIC  
BIOCHEMICAL PARAMETERS IN AMYOTROPHIC  
LATERAL SCLEROSIS PATIENTS WITH NORMAL  
AND ENTERAL NUTRITION**

**B. Chelstowska<sup>1\*</sup>, M. Ku ma-Kozakiewicz<sup>2,3</sup>,  
A. Bara czyk-Ku ma<sup>1,3</sup>**

<sup>1</sup> *Chair and Department of Biochemistry, Medical University of Warsaw,  
Warsaw, Poland*

<sup>2</sup> *Department of Neurology, Medical University of Warsaw, Warsaw, Poland*

<sup>3</sup> *Neurodegenerative Diseases Research Group, Medical University of  
Warsaw, Poland*

*beata.chelstowska@wum.edu.pl*

Amyotrophic lateral sclerosis (ALS) is a neurodegenerative disease with high risk of malnutrition. Severe dysarthria and progressive weight loss are the main reasons for implementation of percutaneous gastrostomy (PEG). **The aim** of the study was to compare blood biochemical parameters in ALS patients with normal and enteral nutrition in correlation with disease phenotype.

**Material and methods:** 449 ALS patients: 51 PEG(+), 398 PEG(-), were characterized demographically and clinically. The serum parameters included glucose concentration, total protein, albumin and lipid panel.

**Results:** PEG(+) patients accounted for 11% of studied subjects. They were significantly older than PEG(-) patients, there was also a higher percentage of females, fewer cases of classic ALS (41%) and progressive muscular atrophy (PMA; 8%) and more cases with progressive bulbar atrophy (PBP; 51%). The disease duration was significantly shorter in PEG(+) patients, they had also a lower BMI and forced vital capacity (FVC). The level of lipid parameters (with the exception of HDL) was significantly lower in all phenotypes, the concentrations of total protein and albumin were slightly lower, and the level of glucose was lower only in PBP.

**Conclusions:** Over 50% of ALS PEG(+) patients presented PBP phenotype. The clinical and biochemical parameters in PEG(+) patients were lower than in PEG(-) patients. The obtained results confirm the indications for PEG insertion in the studied patients.

**P.3.30.**  
**THE IMPORTANCE OF CYCLIC CITRULLINATED  
PEPTIDE ANTIBODIES AND RHEUMATOID FACTOR  
IN RHEUMATOID ARTHRITIS**

**E. Cical<sup>2</sup>, A. Vâlceanu<sup>1,2</sup>, Gh. Coman<sup>2\*</sup>**

*<sup>1</sup>Emergency County Hospital of Brasov, Brasov, Romania*

*<sup>2</sup>University Transilvania of Brasov, Brasov, Romania  
gh.coman@unitbv.ro*

Rheumatoid arthritis (RA) is a systemic autoimmune disease triggered by genetic factors and exogenous factors.

Cyclic citrullinated peptide antibodies (anti-CCP) have high specificity and sensitivity in rheumatoid arthritis, being used as early diagnostic and prognostic markers. Rheumatoid factors (RF) are autoantibodies to the 70% specificity in the diagnosis of rheumatoid arthritis. Thus CCP and RF were included in the diagnostic criteria of PR.

The study was conducted on 41 patients who requested immunological investigations. To determine CCP was used ELISA and for determination of FR was used nephelometric and turbidimetric technique.

In the study, we concluded that the determination of FR is of great importance with CCP because it can diagnose early PR and can monitor its progress.

**P.3.31.**

**PROBIOTICS IN MEDICINE AND POSSIBLE  
ELECTROCHEMICAL DETECTION**

**B. Popescu<sup>1</sup>, B. Popovici<sup>1</sup>, M. Mitrica<sup>1</sup>, L. Neica<sup>1</sup>, G. S. Nunes<sup>2</sup>,  
M. Moga<sup>1</sup>, V. Veregut<sup>1</sup>, M. Badea<sup>1\*</sup>**

<sup>1</sup>*Faculty of Medicine, Transylvania University of Brasov, Brasov, Romania*

<sup>2</sup>*Núcleo de Análise de Resíduos de Pesticidas, NARP, Departamento de  
Tecnologia Química, Universidade Federal do Maranhão (UFMA), São  
Luís, MA, Brazil.*

*mihaela.badea@unitbv.ro*

Probiotics are interesting agents with an important contribution in the field of preventive nutrition. Positive effects have been demonstrated in specific fields with certain products.

Efficient methods for detecting, observing, monitoring of probiotics are developed using fast electrochemical methods. The use of e-tongue has shown great advantages in this field, being a reliable method. Scientific literature indicate that electronic tongue are used for single determination or simultaneous determination of ethanol, acetaldehyde, diacetyl, lactic acid, acetic acid and citric acid content in probiotic fermented milk.

**P.3.32.**

**CHALLENGES OF USING TELEDIAGNOSIS FROM  
THE POINT OF VIEW OF ROMANIAN AND ITALIAN  
STUDENTS**

**M. Badea<sup>1\*</sup>, P. Restani<sup>2</sup>, S. Girotti<sup>3</sup>, M. Moga<sup>1</sup>, L. Rogozea<sup>1</sup>**

<sup>1</sup> *Transilvania University of Brasov, Romania*

<sup>2</sup> *University of Milan, Italy*

<sup>3</sup> *University of Bologna, Italy*  
*mihaela.badea@unitbv.ro*

Telemedicine combines telecommunications technology and medicine, in order to provide and to support health care when distance separates the participants (doctor-patient, doctor-doctor, nurse-doctor, other possibilities).

The study aims to identify the knowledge of students from Romania – Transilvania University of Brasov (Romania), University of Milan (Italy), University of Bologna (Italy) on the issue of telemedicine and telediagnosis, by administering questionnaires with suggested simple or multiple answers.

The answers were collected and analysed. Some of the answers were presented and commented based on different group of students, suggesting some possible explanations of their answers.

The need of more information identified during the questionnaire indicated the topic of telemedicine-telediagnosis as important also for students from medical and pharmaceutical curricula. Some of the results obtained during the intensive programs: “Telemonitoring and Telediagnosis for Life Sciences” (2012-2013) and “BTMIGS - Balkan Basic Training in Minimal Invasive Gynaecological Surgery” (2013-2014) were also presented.

**Acknowledgment**

*The present work was partial supported by Erasmus Intensive Program – 12-EIP-RO-BRASOV01-BIS and 13-EIP-RO BRASOV01.*

**P.3.33.**

**ERRORS AND INTERFERENCES IN URINE ANALYSIS**

**A. Stanciu, L. Rogozea, L.Floroian, L.Dima, A. Pana, M. Badea \***

*Transilvania University of Brasov, Romania  
mihaela.badea@unitbv.ro*

Scientific studies indicate data concerning physicochemical properties and characteristics of urine, urine sampling procedures in different situations (infant, child, adult, immobile patient), highlighting the possible sources of errors.

To emphasize the nurse behaviors during harvesting and analyzing urine samples, there were administered questionnaires with 31 questions. The data obtained were processed and analyzed statistically compared, highlighting the differences between the groups.

It is recommended better information on urine collection techniques, and prior preparation of the patient by medical personnel in order to reduce and to eliminate different sources of errors.

*New Trends on Sensing- Monitoring- Telediagnosis for Life Sciences,  
Brasov, Romania - July 24-26, 2014*

# **New Trends in Biomedical Engineering Sciences**



**PL.4.1.**

**A TRUE THERANOSTIC APPROACH TO MEDICINE:  
TOWARDS TANDEM SENSOR DETECTION AND  
REMOVAL OF ENDOTOXIN IN BLOOD**

**M. Thompson**

*Department of Chemistry, University of Toronto, Ontario, Canada  
mikethom@chem.utoronto.ca*

Endotoxin, also known as lipopolysaccharide (LPS), plays a major role in the pathophysiology of sepsis syndrome in patients. LPS originates from gram negative bacteria and is known to alter the expression of a very large number of genes in homo sapiens. A subsequent litany of anti-endotoxin therapies attempting to block the toxic effects of LPS have failed, a major factor being that none of the anti-endotoxin therapies have used a diagnostic assay to identify patients who might benefit from anti-LPS directed therapy. It is the specific goal of this project to produce a combined system that is capable of both therapy and LPS detection.

Theranostics is a radical new approach to medical practice and treatment. The technology involves the application of diagnostic measurement and therapy, often involving nanoparticle chemistry with attached agents for both detection and drug treatment. Although the method has been proposed in several sectors of medicine, there has been a complete dearth of protocols with genuine, flow-through combined employment of detection science (biosensor) with a therapeutic device. In the present paper we describe an on-line sensor configuration for the real-time detection of the concentration of lipopolysaccharide in blood with coupling of the measurement to a cartridge which is designed to remove this molecule from patient blood via hemoperfusion. The sensor technology is based on ultra-high frequency acoustic wave detection using polymyxin as a receptor for LPS. The same binding agent is used to remove LPS from blood via a specially-designed cartridge. A feedback, closed-loop system is envisaged to enhance the operation of the sensor-cartridge combination.

This approach constitutes for the first time a genuine theranostic application to a major unsolved medical issue, namely a strategy for mitigating the toxic effect of LPS in septic shock.

**PL.4.2**  
**CHARACTERISATION OF FUNCTIONALISED  
NANOPARTICLES**

**F-D. Munteanu**

*Faculty of Food Engineering, Tourism and Environmental Protection,  
„Aurel Vlaicu” University of Arad, Arad, Romania  
florentina.munteanu@uav.ro*

The formulation of nanodevices should have in attention that the final product has the characteristics that makes it prone for use in theranostics. Some of the main characteristics of the nanodevices are referring to the nanoparticle size, surface charge and permeability, biodegradability, biocompatibility, toxicity, drug solubility and stability, design of the drug release and antigenicity of the final product. The present work will have in attention several methods used for the characterization of functionalised nanodevices.

## **K.4.1. WIRELESS TECHNOLOGIES AND VIRTUAL INSTRUMENTATION IN “SENSING - MONITORIG - TELEMEDICINE”**

**D.Ursutiu<sup>1\*</sup>, M. Moga<sup>1</sup>, C.Samoila<sup>1</sup>, C. Ravariu<sup>2</sup>**

<sup>1</sup> *University “Transylvania” of Brasov, Brasov, Romania*

<sup>2</sup> *University Polytechnic of Bucharest, Bucharest Romania  
udoru@unitbv.ro*

The **Internet of Things (IoT)** refers to uniquely identifiable objects and their virtual representations in an Internet-like structure (wired or wireless). **Cloud Instrumentation (CI)** is an Internet of Things (IoT) platform for measurements using easy reconfigurable ICs and modules, broad range of sensors (including medical ones), box instruments, PC-based, intelligent phones, etc. – where the app lives in the IoT and devices are simply the profile and the auto-controller.

There are a lot of new challenges and opportunities, for **Graphical programming techniques** (LabVIEW from National Instruments, Cypress Designer and/or Creator, VEE-Pro from Agilent, etc.) in developing tools for IoT: sensing devices, monitoring systems and applications for telediagnosis. The challenge of displaying thousands of channels of data in aggregation, while also having access to each of them individually, while also combining them in patterns of relevance, etc. offer many new opportunities and better data visualization and interpretation.

In the paper we present **new classes of devices** (reconfigurable devices, wireless systems, intelligent mobile phones controllers etc.) with some implementations in the fields of sensing – monitoring – telemedicine (see Fig.1) based on CI and IoT.

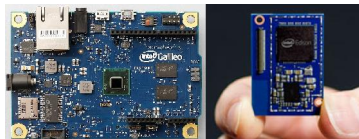


Fig.1 INTEL Galileo and Edison boards

### **Acknowledgments**

*We like to thanks to National Instruments, Cypress Semiconductor, Cores Electronic LLC and INTEL for the hardware and software support and all the offered assistance.*

#### **K.4.2.**

### **METHODOLOGY OF CORRELATIVE EVALUATION AND REHABILITATION OF PERSONS WITH CEREBROVASCULAR ACCIDENT (CVA)**

**M. Baritz\* , D. Cotoros, D. Barbu**

*Product Design, Mechatronic and Environment Department, University  
Transilvania Brasov, Brasov, Romania,  
mbaritz@unitbv.ro*

At this time there is a wide range of national and international studies related to the topic of evaluation and rehabilitation of persons who suffered a stroke (CVA) and many of these deal with the issue only from the point of view of developing new procedures and instruments. By this research we try to combine several evaluation structures and find correlations that might highlight the evaluation stages of the post stroke evolution, training and rehabilitation for some CVA cases.

In the first part of the paper we present the aspects related to the manifestation and post traumatic evolution of the CVA affected person and respectively the evaluation methodology during the recovery period. In the second part of the paper we also presented and structured the correlative evaluation methodology and also the design of the experimental system – as an interconnected assembly by means of which the correlative evaluation methodology (CEM) can be applied.

In the final part of the paper, the aspects related to the results and conclusions obtained by applying CEM are presented. Also we present the future development directions and methodology diversification towards other rehabilitation domains such as the neuro-motor or locomotor ones.

#### **Acknowledgments**

*The paper is a part of the research done within the Advanced Mechatronic Research Center from Research Institute of Transilvania University Brasov, Romania.*

### **O.4.1. DROPLETS GENERATION SYSTEM MODELLING FOR DRUG DELIVERY APPLICATIONS**

**B. Firtat<sup>1\*</sup>, C. Moldovan<sup>1</sup>, P. Schiopu<sup>2</sup>**

<sup>1</sup>*National Institute for Research and Development in Microtechnologies,  
Bucharest, Romania*

<sup>2</sup>*“Politehnica” University, Bucharest, Romania  
bogdan.firtat@imt.ro*

Fluid droplets play an important role in many drug delivery systems, for delivering very low, but strictly controlled quantities of medication. Either in liquid phase (liquid droplets contained in a bio-fluid, such as blood) or as aerosols (liquid droplets dispersed in the breathing air), the droplet generators must be specifically targeted and optimised for the respective application.

This paper focuses on developing a computer model, using CFD (Computational Fluid Dynamics) methods, to model and optimise a set of various droplet generation systems, used for drug delivery applications. All the involved parameters: fluids type (liquid or gas), fluids and channels properties (surface tension coefficients, density, contact angle etc.), fluids velocities and geometry have been analysed and the system have been optimised, to target the specific needs of the bio-medical applications.

The delivered volume of medication can be efficiently calculated and adjusted, controlling the volume and number of generated droplet per time unit. The model can be easily adapted to account for different types of drug delivery systems and different types of fluid medications.

#### **Acknowledgments**

*IMUNOPLAT – Micro Immunosensors Platform for Metabolic Syndrome Investigation, PN II project, 2012-2015*

## **O.4.2. FREESCALE TWR-K53 PLATFORM FOR CARDIAC RHYTHM MONITORING**

**R. Maldarus, S.A. Moraru, A. Apostu, R. Demeter**

*Transilvania University of Brasov, Brasov, Romania  
maldarusrazvan@yahoo.com, smoraru@unitbv.ro,  
apostu.a404@gmail.com, rdemeter@unitbv.ro*

This project presents one technique regarding cardiac rhythm monitoring by using the FreeScale TWR-K53 development board.

Along with the board, the TWR MED-EKG module is also employed for its signal quality enhancement abilities. The board offers powerful tools for signal capture and signal filtering, being part of the FreeScale Tower System. The System allows for multiple peripherals to be added, such as specific medical-oriented modules, communication modules and others.

Communication between the System and the computer is possible due to the TWR-SER module. The module enables serial communication and supplies several communication solutions. The main purpose of the system is creating an electrocardiogram that may be interpreted in order to determine certain clinical parameters. The central concept behind the electrocardiogram is built around the P, Q, R, S and T waves. The system is capable of displaying these waves on a personal computer, prior to interpretation.

The created system is developing in the Freescale Laboratory of the Department of Automatics and Information Technology within the Faculty of Electrical Engineering and Computer Science and is testing in clinical conditions, at the University Clinic Hospital within the Faculty of Medicine.

**Acknowledgments:** *The paper were developed within the project IBM Faculty Award – SOCIAL "ambiance assisting living System by applying high Order Computational Intelligence in data mining and AnaLyzing".*

### **O.4.3.**

## **WIRELESS SENSOR NETWORK FOR MEDICAL MONITORING OF PERSONS AT RISK**

**P. Szakacs-Simon, S.A. Moraru, D.M. Kristaly**

*Transilvania University of Brasov, Brasov, Romania  
peter.szakacs@unitbv.ro, smoraru@unitbv.ro, dominic.kristaly@unitbv.ro*

Ambulatory patient monitoring objectives being focused on prevention and fast emergency reporting, a set of hardware and software tools were developed. Time scheduled or continuous measurements can help physicians to easier and better treat their patients, because they are informed about the new values after each measurement. Medication effectiveness can be verified, and presence of important side effects can be also detected. In case of an emergency, even outdoor, if the patient is not able to call for help, the system can initiate an alert based on vital signs readings or fall detection.

In this paper we present a wireless sensor network developed in order to collect health related information about people at risk in their home environment. Wearable nodes can read information from small medical devices about EKG, SpO<sub>2</sub>, blood pressure or body temperature, can also measure accelerations in order to evaluate body position, fall or inactivity. Fixed nodes are distributed in the home environment and collects additional human activity related information.

Data collected by the sensors network is gathered by a local computer that stores it locally, and sends it to a central server for further processing. The central server runs analysis software and generates responses towards the actors involved by the system. The server can alert the caregivers, relatives or professionals, monitoring the users of dangerous or potentially dangerous situations (fall, detection of health emergencies). Also, it can issue messages for the user to help them achieve a healthier lifestyle by encouragements or virtually reward them for being active or doing activities that are appropriate and beneficial to their health conditions.

#### **O.4.4.**

### **LIVERESCUE, AN ANDROID APPLICATION TO ENABLE VOLUNTEERS TO REACT FASTER TO MEDICAL EMERGENCIES**

**A. Bârsan, S. Nica, B. Brînzoiu, I. Szén, L. Sangerozan**

*Transilvania University of Brasov, Mathematics and Computer  
Science, Iuliu Maniu Street No. 50*

*andrei.ioan.barsan@gmail.com; livia.sangeorzan@gmail.com*

The LiveRescue system was conceived for aiding the paramedics in their everyday job, and saving lives by getting help to the people that call the emergency line for life threatening health issues. LiveRescue has two components: the Android client and the web application.

When an emergency call is made and there is need for paramedics, the call center operator, having access to the web application, marks the location of the emergency, adds a description and then it is inserted in the list of on-going incidents. The LiveRescue app allows the users to view the emergencies in their area and react accordingly. If the user can help in that kind of situation, he can go and aid the patient until the paramedics arrive, maybe saving his life.

There may be a slight delay in the receiving of the notifications, but that is caused by the phone client getting the list of emergencies once every 5 minutes not to drain the battery of the phone.



**O.4.5.**  
**ONLINE SOFTWARE TOOL FOR MEDICAL  
INSTRUMENTS RECOGNITION BY THE MEDICAL  
STUDENT**

**L. Sangeorzan\***, C. Nitescu, E. Dinu, L. Rogozea

*University Transilvania of Bra ov, Bra ov, România  
livia.sangeorzan@gmail.com*

During the last years web applications became more popular as always. This lead to a change on how applications are perceived and now, many applications open up in a browser. Following the same transformation, it did not take long until online tests appeared and replaced classic exams written on paper. The new way of testing was able to eliminate the evaluator's subjectivity and the emotions that many of the students have felt.

This application takes one step further, and adds a "hands-on" feeling to the online tests. The main advantages of the application are:

- Security and control – the access is secured, being accessible upon authentication. Teachers control which tests invitations are send and when the deadline is, students control when they take the test.
- Intuitive interface, improved user experience – using only drag & drop the student can associate the instruments with a type of activity.
- Cost reduction – there is no need of expensive instruments to be physically available.
- Automated evaluation – the results are automatically calculated.

The application can lead the change of the way students are prepared and evaluated, by virtualizing instruments and placing them in front of every student, at the right cost.

**O.4.6.**  
**ANALYSIS OF THE MOBILITY AND MANIPULATION  
DEGREE AFTER EXPOSURE TO CONTROLLED  
VIBRATIONS IN THE HUMAN BODY**

**M. Baritz<sup>\*</sup>, D. Cotoros, I. Balcu**

*Product Design, Mechatronic and Environment Department, University  
Transilvania Brasov, Brasov, Romania  
mbaritz@unitbv.ro*

A series of biomechanical analyses study in a wide and dedicated manner the vibrations effect upon the human body, by establishing some standards for evaluation and protection in this field.

In this paper, a research structure is designed and presented based upon the determination of the mobility and respectively manipulation degree when the organism is exposed in a controlled manner to a set of vibrations. In this respect in the second part of the paper, we presented both the experimental system and the structure of the analysis methodology for post-exposure (AMP-E) in order to be able to emphasize the manners of damaging the human organism following the controlled vibrations, but also the possibility that these vibrations become stimulating for certain mobility characteristics.

In the final part of the paper, the aspects related to the results and conclusions obtained by applying AMP-E are presented. Also we present the future possibilities of developing and diversifying the methodology towards other evaluation and/or rehabilitation domains, such as neuro-motor and locomotor.

**Acknowledgments**

*The paper is a part of the research done within the Advanced Mechatronic Research Center from Research Institute of Transilvania University Brasov, Romania.*

#### **O.4.7.**

### **ELECTRONIC CIRCUITS DEDICATED FOR NEW PLATFORMS IN ELECTROPHYSIOLOGY - NEW TOPICS FOR SOLID STATE CIRCUITS**

**C. Ravariu<sup>1\*</sup>, D. Ursutiu<sup>2</sup>, F. Babarada<sup>1</sup>, C. Ionescu-Tirgoviste<sup>3</sup>,  
A. Janel<sup>4</sup>, S. Arama<sup>5</sup>, C. Samoila<sup>2</sup>**

<sup>1</sup> *"Politehnica" University of Bucharest, Romania, Chair of the IEEE  
SSCS037 Romanian Chapter; Faculty of Electronics Telecommunications  
and Information Technology, Bucharest, Romania*

<sup>2</sup> *"Transilvania" University of Brasov, Faculty of Electrical Engineering  
and Computers, Brasov, Romania*

<sup>3</sup> *"Paulescu" National Institute of Diabetes, Bucharest, Romania*

<sup>4</sup> *Seletron SRL, Bucharest, Romania*

<sup>5</sup> *"Carol Davila" University of Medicine and Pharmacy, Bucharest,  
Romania*

*cristian.ravariu@upb.ro*

Besides to some classical protocol in electrophysiology, like ECG or EEG, novel techniques were recently developed: Electro-oculogram, Electro-hepatogram or Electro-gastrogram,. One more flexible future solution can be use the Cypress PSoC (PSoC 1,3,4,5) technologies. The PSoC1 embedded system is a programmable single-chip, including configurable analog and digital peripheral functions, analog and digital buss, memory and microcontroller.

Searching the pancreatic electrical signal, we developed a hardware solution. The analog block is based on a dynamic range compressor, containing the automatic gain control block and a clipper block. At clipper output a lowpass filter is connected since to abruptly cut the high frequencies, like 50Hz, ECG. The data vector recording is performing by ATMega32 microcontroller, including ten bits A/D conversion port.

**P.4.1.  
COMPUTATIONAL METHOD FOR ESTIMATING THE  
THRESHOLD CYCLE IN RT-PCR FOR PATHOGEN  
DETECTION**

**I. Stanciu<sup>1\*</sup>, C. Moldovan<sup>1</sup>, G. Dingemans<sup>2</sup>, G. Simons<sup>2</sup>, R. Waber<sup>2</sup>**

*1 National Institute for R&D in Microtechnologies Bucharest  
2 PathoFinder B.V. Maastricht  
irina.stanciu@imt.ro*

RT-PCR is a powerful technology in molecular biology, which allows specific sequences of DNA to be amplified for detection. Fluorescent dyes are used to generate a fluorescent signal that increases proportionally with the number of product molecules. The fluorescent signal is plotted against the cycle number to obtain the amplification curve that represents the accumulation of product over the reaction duration. Initially, fluorescence remains at background levels, and increases in fluorescence are not detectable. The exponential phase follows, where enough amplified product accumulates to obtain a detectable signal. The cycle when this occurs is the threshold cycle. By accurately estimating the threshold, the initial amount of molecules can be calculated.

We propose a novel and precise computational method for estimating the threshold cycle. The initial phase of the amplification curve is estimated by linear regression. When two consecutive points along the amplification curve are found at significant distance from the regression line, it is considered that the exponential phase has started and the threshold value is set at the maximum estimated value. Using this threshold, the  $C_t$  values are determined. The method has been tested using experimental data and accurate results have been obtained for general cases and also for particular cases.

**Acknowledgments**

*PARCIVAL - Partner Network for a Clinically Validated Multi-Analyte Lab-on-a-Chip Platform, FP7 HEALTH.2011.2.3.1-4*

**P.4.2.  
POLYMERS IN DRUG DELIVERY**

**L. Floroian<sup>1\*</sup>, C.N. Zoita<sup>2</sup>, D. Floroian<sup>1</sup>, C. Samoila<sup>3</sup>**

<sup>1</sup> *Automation and Information Technology Department, Transilvania  
University of Brasov, Brasov, Romania*

<sup>2</sup> *National Institute for Optoelectronics, Magurele, Ilfov, Romania*

<sup>3</sup> *Materials Science Department, Transilvania University of Brasov, Brasov,  
Romania  
lauraf@unitbv.ro*

The science of drug delivery may be described as the application of chemical and biological principles to control the in vivo temporal and spatial location of drug molecules for clinical benefit. When drugs are administered, only a very small fraction of the dose actually hits the relevant receptors or sites of action, and most of the dose is actually wasted either by being taken up into the “wrong” tissue, removed from the “right” tissue too quickly, or destroyed en route before arrival. Scientists researching drug delivery seek to address these issues in order to (1) maximize drug activity and (2) minimize side effects.

This work is an overview on the issues that must be considered when selecting a polymer for biomedical applications: i.e., for fabricating a drug delivery agent, surgical suture, prosthetic implant, or medical device. A number of exemplar polymers and their critical properties are discussed. The use of biomaterials to produce a combined prosthetic device and drug delivery system has been recently demonstrated by the emergence of a new therapeutic entity — the drug-eluting stent.

**Acknowledgments**

*This paper is supported by the Sectorial Operational Programme Human Resources Development (SOP HRD), financed from the European Social Fund and by the Romanian Government under the project number POSDRU/159/1.5/S/134378.*

**P.4.3.  
THE ROLE OF IMMUNOCHEMICAL ASSAYS  
DURING CRIMINAL INVESTIGATIONS INVOLVING  
THE USE OF TNT**

**F.S. Romolo<sup>1</sup>, S. Girotti<sup>2\*</sup>, E. Ferri<sup>2</sup>, A. Montoya<sup>3</sup>, M.D'Elia<sup>4</sup>, L.  
Ripani<sup>5</sup>, G. Peluso<sup>5</sup>, R. Risoluti<sup>5</sup>, E. Maiolini<sup>2</sup>**

<sup>1</sup> *Dipartimento SAIMLAL, SAPIENZA Università di Roma, Italy.*

<sup>2</sup> *Dipartimento di Farmacia e Biotecnologie, Università di Bologna, Italy*

<sup>3</sup> *Universidad Politécnica de Valencia, Spain.*

<sup>4</sup> *Gabinetto Regionale di Polizia Scientifica Emilia-Romagna, Bologna,  
Italy*

<sup>5</sup> *Reparto Investigazioni Scientifiche (RIS) Carabinieri Roma, Italy  
stefano.girotti@unibo.it*

During criminal investigations in cases involving the use of explosives, the capability to rapidly collect information about the chemical substances involved is very important, especially if this can happen on the crime scene. 2,4,6-trinitrotoluene (TNT) is one of the most employed explosives in the 20th century and, despite the growing use of improvised explosives, its use by criminals having access to TNT is not expected to decrease. Interaction of immunoreagents (antibody and the corresponding antigen) allows detection of chemical substances using enzyme-substrate reactions, such as TNT.

We developed three immunochemical assays able to detect TNT: an indirect competitive ELISA with chemiluminescent detection (CL-ELISA), a lateral flow immunoassay (LFIA) based on colloidal gold nanoparticles label and a chemiluminescent-LFIA (CL-LFIA). The developed tests were applied to real samples of various materials involved in controlled explosions of Improvised Explosive Devices (IEDs) and to samples from tests of handling TNT. LFIA and the CL-LFIA result especially practical and easy to use on-site. Using optimised working conditions the limit of detection of the CL-LFIA was  $0.05 \mu\text{g mL}^{-1}$ . The total analysis time was 15 minutes. ELISA showed a very good sensitivity (LOD of  $0,4 \text{ ng mL}^{-1}$ ) and a good reproducibility (CV value about 7%).

**P.4.4.**

**APPLICATION OF VIRTUAL INSTRUMENTATION IN  
X-RAY AND GAMMA-RAY SPECTROSCOPY. A COST-  
EFFECTIVE VIRTUAL LIST-MODE MULTI-  
PARAMETER MULTICHANNEL ANALYZER.**

**N.C. Zoita<sup>1\*</sup>, L. Floroian<sup>2</sup>**

<sup>1</sup>*National Institute for Optoelectronics, Magurele, Ilfov, Romania*

<sup>2</sup>*Transilvania University of Brasov, Brasov, Romania*

*cnzoita@inoe.ro*

Virtual instrumentation provides an ideal platform for developing curriculum for students training and for conducting scientific research. In comparison with stand-alone instruments, the major benefits of virtual instrumentation include increased performance and reduced costs. In addition, the processing power and the flexibility of virtual instruments are much greater, while the open architecture of industry-standard computers allow the functionality of virtual instruments to be user defined. Virtual instrumentation applications have encompassed nearly every research and industry field, including the biomedical one. With application in biomedical spectroscopy and imaging, this paper presents a virtual multi-parameter multichannel analyzer/scaler for x-ray and gamma-ray spectroscopy, which is able to work in list-mode as well as in pulse height analysis mode. It is based on a software digital signal processor and has a zero conversion dead-time.

**Acknowledgments**

*This work was partially supported by AFOSR Contract no. F49620-99-1-0082, F49620-99-1-008, F49620-02-1-0141.*

**P.4.5.**  
**MODELLING LIPOPHILICITY OF  
CATECHOLAMINES USING A NEW QSAR  
APPROACH**

**I.A. Sima\* , R.D. Na cu-Briciu, M.V. Diudea**

*Department of Analytical Chemistry, Faculty of Chemistry and Chemical  
Engineering, Babes-Bolyai University, Cluj-Napoca, Romania,  
ioanatuhtiu@gmail.com*

A set of 38 catecholamines and related compounds was submitted to a novel QSAR approach based on weighting and alignment of the molecules over a hypermolecule. Any QSAR approach assumes that a macroscopic property of a chemical compound depends on the molecular structure or the topological indices, which are derived from the molecular topology or geometry. In the last years, thousands of topological indices have been proposed and used in predicting various molecular properties. In this study the indices were calculated using TOPOCluj software and these were adjacency, connectivity, detour, distance, IE[CjMax], IE[CjMin], IP[CjMax], IP[CjMin] and Randic. Further, the calculated indices were correlated with the lipophilicity coefficient, logP which controls the passive transport of a molecule through the cell membranes. The correlating algorithm followed the steps: (1) generate the hypermolecule; (2) calculate the molecular descriptors; (3) find the best regression equations by correlating the topological indices with the chosen property (logP) and (4) test the predictive capability of the model.



**P.4.6.  
BIOACTIVE AND ANTIMICROBIAN  
NANOSTRUCTURED LAYERS FOR COATING OF  
IMPLANTS**

**L. Floroian<sup>1\*</sup>, M. Badea<sup>2</sup>, D. Floroian<sup>1</sup>, C. Samoila<sup>3</sup>**

<sup>1</sup> *Automation and Information Technology Department, Transilvania  
University of Brasov, Brasov, Romania*

<sup>2</sup> *Fundamental, Prophylactic and Clinical Specialties Department,  
Transilvania University of Brasov, Brasov, Romania*

<sup>3</sup> *Materials Science Department, Transilvania University of Brasov, Brasov,  
Romania  
lauraf@unitbv.ro*

In the last years, the progress in surgical techniques and synthetic biomaterials has led to an explosive growth in the use of implants. But the introduction of an implant into the body is always associated with the risk of microbial infection. Local drug delivery is an effective and promising procedure of delivering drugs right at the site of implantation, in order to prevent implant-associated infections. In this work we report a modern approach of the implant type structures for local drug delivery in bone implantation. By the advanced matrix assisted pulsed laser evaporation technique we obtained onto medical grade stainless steel substrates new bioactive structures that contain antimicrobial agents such as antibiotics from tetracycline classes incorporated into bioactive glass-polymer systems.

***Acknowledgments***

*This paper is supported by the Sectorial Operational Programme Human Resources Development (SOP HRD), financed from the European Social Fund and by the Romanian Government under the project number POSDRU/159/1.5/S/134378.*

**P 4.7.**

**ARTIFICIAL INTELLIGENCE TECHNOLOGY IN  
HEALTH INFORMATICS**

**A.B. M. Salem**

*Faculty of Computer and Information sciences, Ain Shams University,  
Abbasia, Cairo, Egypt  
abmsalem@yahoo.com; absalem@cis.asu.edu.eg*

Artificial intelligence (AI) is science and technology and is based on many disciplines such as: computer science, philosophy, psychology, mathematics, biology, linguistics, knowledge computing and engineering. AI has been mainly studied as computer based technologies. Various intelligent methodologies, computational techniques and knowledge-based systems have been developed for automated reasoning and learning. AI technologies are robust, can be successfully applied to complex problems, are efficiently adaptive, and usually have a parallel computational architecture. For those reasons they have been proved to be effective and efficient in developing intelligent systems for many tasks in health sciences. The aim of this talk is to make an overview of some of AI techniques and approaches and their applications in medical informatics and health care. The work covers the following applications: (a) case-based reasoning approach for cancer and heart diagnosis, (b) ontological engineering approach for breast cancer knowledge management, and (c) mining patient data using rough sets theory to determine thrombosis disease.

Bun de tipar la data de: 15.07.2014  
Tiraj: 150  
Coli de tipar: 38 – 148 x 210  
Tiparul: S.C. YOLANS COM s.r.l. Bra ov