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Departamentul Biosenzori

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Data nasterii: 08.11.1970

Casatorita (nume purtat anterior Mehedintu) 1 copil, nascut 22.03.2005

Educatie

Universitatea Catolica Leuven, Leuven, Belgia	Fiziologie	PostDoc, 2002-2003
Universitatea Bucuresti, Facultatea de Biologie Bucuresti, Romania	Biologie	PhD in Biologie, 1998-2002
Universitatea Bucuresti, Facultatea de Fizica Bucuresti, Romania	Biofizica	MSc Biofizica, 1994-1995
Universitatea din Bucuresti, Facultatea de Fizica Biotehnologie Bucuresti, Romania		Inginer Fizician, 1989-1994

Experienta profesionala

Sept 2005 Cercetator invitat Universitatea Nationala din Singapore, Singapore
2001-prezent Centrul International de Biodinamica, Bucuresti, Romania (*din 2004 Cercetator Principal I*)
1997 – 2000 Biofizician (din 1998 Cercetator principal) Institutul National de Cercetare Dezvoltare in Biotehnologie (INBT) – Centrul UNESCO de Biodinamica, Bucuresti
Iul 1996–Nov 1996 Cercetator asociat, Institutul de Biotehnologie Moleculara, Jena, Germania
1994-1997 Biofizician, Institutul National de Cercetare Dezvoltare in Biotehnologie (INBT)

Domenii de expertiza. Materiale noi, Rezonanta Plasmonilor de Suprafata (aplicatii in monitorizarea reactiilor bioafine); Microscopie avansata (inclusiv TIRFM - vizualizarea proceselor celulare la nivel membranal, evaluarea cantitativa prin fluorescenta a sistemelor model, lipozomi, nanoparticule, interfete functionalizate); Combinarea SPR, TIRFM si impedanta la nivelul unor platforme unice prin dezvoltarea de suprafete de sensing cu configuratii controlate si studii de interactie dintre suprafetele modificate cu celulele biologice pentru aplicatii in detectie si imagistica; analiza bio-adeziunii la suprafetele functionalizate; dezvoltarea de metode si dispozitive pentru evaluarea platformelor celulare avand la baza tehnici SPR, de impedanta si imagistica electro-plasmonica. Biologie celulara in conditii normale si patologice (inclusiv hipoxie) aplicatii ale tehnicilor de optogenetica.

Activitati sinergice

■ Expert Evaluator Horizon 2020, People MC Chimie, FETProact Biotehnologie 2016, People, panel Chimie 2015, 2014, ■ Expert Evaluator FP7 People, Chimie 2013, Stiintele vietii 2009 ■ Membru in echipa de organizare a Conferintelor si Workshopurilor internationale: IInd EURYIAS 2008 International symposium on Self-Organization and Selection in Evolution of Matter, Molecules and Life Bucuresti, 2008- Biodynamics: ways and means to appraise the impact of gentle stimuli on selected biological/cellular system; International Conference Biosensing and Biodynamics: From Basics to Applications 18-21 Mai 2006 ICBB 2006- “Biodynamics, Sensing through dynamics of (bio)interfaces & cellular platforms; ■ Membru in Comitetul de Program ESOF2008 (Barcelona) ■ Reviewer pentru Biosensors & Bioelectronics, Plasmonics, Sensors, Talanta, Lab Chip, J Mat Chem B, Chem Comm, Anal Chim Acta ■ Coordonator al Departamentului de Analiza din cadrul Centrului International de Biodinamica (CIB) care include laboratorul de analiza apei, acreditat.

Activitati Didactice. Masterul de Biodinamica din cadrul Facultatii de Biologie, Universitatea Bucuresti, curs “Metode actuale de evaluare a bio-suprafetelor” (2007-2008); supervizarea a 5 studenti la nivel doctoral din cadrul CIB: S. David, C. Polonschii, A. Olaru, M. Axinie, L.Stanica.

Collaborari internationale: Prof. Dr. Patrik Wagner (Nanotehnologie, Limburgs Universitair Centrum, Belgia); Prof. Dr. Paul Steels (Facultatea de Medicina, Limburgs Universitair Centrum, Belgia); Prof. J.-L.

Marty (Universitatea Perpignan, Franta); Prof. C. Ghommidh, (Universitatea Montpellier, Franta); Prof. Silvana Andreescu (Universitatea Clarkson, USA)

Burse si Premii. **1996** Boehringer Ingelheim, Stagiul de cercetare la Institutul de Biotehnologie Moleculara, Jena, Germania; **2002, 2003** Stagii postdoctorale Dept. de fiziologie celulara Universitatea Catolica Leuven, Belgia; **2005** *Eastern Europe Research Scientists & Students Exchange & Collaboration Programme* Universitatea Nationala din Singapore

•Oct 2000 – Premiul II poster Single Cell Research Foundation (EMBO Lecture Course Molecular and Cellular Biology from Plant to Human Cells September-October 2000-, Debrecen, Ungaria).

•Iun 2003 – Premiul II pentru prez postdoc EURESCO (European Research Conference "Biological Surfaces and Interfaces" - Castelvechio Pascoli, Italia).

•Nov 2004 – Medalia de argint "Method to pinpoint the presence of some analytes in liquid solutions" Expozitia mondiala pentru Inovare, cercetare si tehnologie, EUREKA, Bruxelles;

•2007 –Grant Turner Luminometer 20/20n.

Proiecte de cercetare:

	Internationale	Pozitie
8	Flag-Era Graphitivity : Graphene -based optoelectrochemical sensor for the simultaneous monitoring of the electrical and chemical activity of single cells	Cercetator principal Platforme celulare; aplicatii biosenzoristice
7	NATO Science for peace "Cell biosensors for detection of chemical and biological threats"	Cercetator principal Platforme celulare; aplicatii biosenzoristice
6	FP7 EC "DYNANO" "Dynamic interactive nanosystems" Coordonator Proiect: Dr. Mihai BARBOIU, Institutul European de Membrane -IEM, Montpellier, Franta. FP7-PEOPLE-2011-ITN - Contract: PITN-GA-2011-289033	Coordonator echipa Modelari avansate, SPR si aplicatii biosenzoristice
5	TUMORANALYZER – Contract 7/RO-CH/RSRP/01.01.2013, Modulul III Capacitati, Response of in vitro hypoxic tumor models to potentially therapeutic compounds as revealed by an advanced analytical platform	Cercetator principal TIRFM, SPR Biosensing
4	FP7 Protein Aggregation - a quantitative assessment (PROARGUS) Marie Curie Action: "Grant de reintegrare" (FP7-PEOPLE-2009-RG)	Indrumator tehnic
3	FP7 EC "NANOMAGMA" NANOstructured active MAGneto-plasmonic MAterials Partnership with Consejo Superior de Investigaciones Cientificas, Spain	Cercetator principal Modelari avansate, SPR si aplicatii biosenzoristice
2	FP6 <i>ROBIOS</i> - Strengthening Romanian Research Training Capacities in Biosensing Contract- INCO-2004-ACC-RSTP	Team/WP Leader
1	FP6 CHARPAN Contract - IP 515803	Investigator

	Nationale	
5	BioScope - Contract. 11/2012, ID: PN II-ID-PCCE-2011-2-0075 Electro-Plasmonics for the analysis of the dynamics of cellular processes and biomolecular interactions	Coordonator partener
4	Advanced investigations towards medical applications of nuclear Technologies – PROPETHAD Partner* (coordonator Institutul de fizica si inginerie nucleara H. Hulubei)	Cercetator - microscopie
3	Development of nucleic acid-based biosensors for environmental assessment of some selected warfare agents (BIOSADN) Partner* (coordonator Universitatea Bucuresti)	Cercetator Dezvoltare platform biosenzoristica
2	Controlling the interaction between human and bacterial cells onto nanostructured surfaces: strategies to accomplish "intelligent" biosurfaces	Coordonator pachet de lucru Analiza electro-optica si AFM a

	(NANOINT)	platformelor celulare
1	The diagnostic and prognostic relevance of the endomicroscopic aspect of microvasculature in upper digestive premalign or malign lesions - DIAPROGENDO Partner* (coordonator proiect Institutul Clinic Fundeni)	Cercetator principal microscopie

Alte Informatii: 28 ISI articole (din 2009: scor mediu de influenta 0.522 si 33.46 factor de influenta, impact factor total 70.271), 5 capitole de carte (Springer, ACS), 4 patente.

Publicatii

1. M. Gheorghiu, L. Stanica, M. Ghinia, C. Polonschii, S. David, D. Bratu, O. Popescu, T. Badea, E. Gheorghiu, Harnessing light driven dynamic processes for cellular sensing, *Biosens. Bioelectron.* (2016) under review
2. S. David, C. Polonschii, M. Gheorghiu, D. Bratu, E. Gheorghiu, Biosensing Based on Magneto-Optical Surface Plasmon Resonance, in MiMB series, Biosensors and Biodetection: Methods and Protocols, IInd Ed., A. Rasooly & B. Prickril Eds., Springer, (2016) in print
3. Vasilescu A., Purcarea C., Popa E., Zamfir M., Mihai I., Litescu S., David S., Gaspar S., Gheorghiu M., Marty J-L., Versatile SPR aptasensor for detection of lysozyme dimer in oligomeric and aggregated mixtures, *Biosens. Bioelectron.* (2016), 83, 353-360, DOI: 10.1016/j.bios.2016.04.080
4. A. Vasilescu, S. Gáspár, M. Gheorghiu, S. David, V. Dinca, S. Peteu, Q. Wang, M. Li, R. Boukherroub, S. Szunerits, Surface Plasmon Resonance based sensing of lysozyme in serum on Micrococcus lysodeikticus-modified graphene oxide surfaces *Biosens. Bioelectron.* (2016) DOI: 10.1016/j.bios.2016.03.040
5. A. Bondarenko, F. Cortes-Salazar, M. Gheorghiu, S. Gaspar, D. Momotenko, L. Stanica, A. Lesch, E. Gheorghiu, H. H. Girault, Electrochemical push-pull probe: from scanning electrochemical microscopy to multimodal altering of cell microenvironment, *Anal. Chem.*, (2015) vol.87, p.4479–4486 DOI: 10.1021/acs.analchem.5b00455
6. S. David, C. Polonschii, C. Luculescu, M. Gheorghiu, S. Gaspar, E. Gheorghiu, Magneto-Plasmonic Biosensor with Enhanced Analytical Response and Stability, *Biosens. Bioelectron.* (2015), 63, 525–532
7. C. Polonschii, S. David, S. Gaspar, M. Gheorghiu, M. Rosu-Hamzescu, E. Gheorghiu, Complementarity of EIS and SPR to Reveal Specific and Nonspecific Binding When Interrogating a Model Bioaffinity Sensor; Perspective Offered by Plasmonic Based EIS, *Anal. Chem.*, (2014), 86 (17), 8553–8562
8. M. Gheorghiu, S. David, C. Polonschii, A. Olaru, S. Gaspar, O. Bajenaru, B. O. Popescu, E. Gheorghiu, Label free sensing platform for amyloid fibrils effect on living cells, *Biosens. Bioelectron* 52, (2014) 89–97, DOI: 10.1016/j.bios.2013.08.028
9. M. Gheorghiu, A-M Enciu, B.O. Popescu, E. Gheorghiu, Functional and molecular characterization of A β ₄₂ effect on barrier properties, *J Alzheimers Dis.* (2014); 38(4):787-98
10. S. David, C. Polonschii, M. Gheorghiu, D. Bratu, A. Dobre, E. Gheorghiu, Assessment of pathogenic bacteria using periodic actuation, *Lab Chip*, (2013), Aug 21;13(16):3192-8
11. A. Olaru, M. Gheorghiu, S. David, C. Polonschii, E. Gheorghiu, Quality assessment of SPR sensor chips; case study on L1 chips, *Biosens. Bioelectron* 45 (2013) 77-81
12. M. Gheorghiu, S. David, C. Polonschii, D. Bratu, E. Gheorghiu “Dynamic assessment of Amyloid oligomers – cell membrane interaction by advanced impedance spectroscopy” *J. Phys.: Conf. Ser.* 434 (2013) 012090

13. M. Gheorghiu, D. Bratu, A. Olaru, C. Polonschii, E. Gheorghiu "Revealing membrane potential by advanced impedance spectroscopy: theoretical and experimental aspects" *J. Phys.: Conf. Ser.* 434 (2013) 012087
14. S. Gáspár, S. David, C. Polonschii, I. Marcu, M. Gheorghiu, E. Gheorghiu, Simultaneous impedimetric and amperometric interrogation of renal cells exposed to a calculus-forming salt, *Anal Chim Acta.* (2012) Feb 3; 713:115-20
15. M. Gheorghiu, C. Polonschii, S. David, A. Olaru, E. Gheorghiu, SPR Bioanalytical platform to appraise the interaction between antimicrobial peptides and lipid membranes, In *Optical Nano- and Microsystems for Bioanalytics, Series Chemo- and Biosensors 10* (Series Editor Gerald Urban), Springer (2012) pp 183-210
16. S. Andreescu, M. Gheorghiu, R. E. Ozel, K. Wallace Methodologies for Toxicity Monitoring and Nanotechnology Risk Assessment, chapter 7 in ACS books series "Biotechnology and Nanotechnology Risk Assessment: Minding and Managing the Potential Threats around Us" Editor(s) Steven Ripp and Theodore B. Henry, Vol 1079 Publication Date (Web) October 18, (2011) DOI: 10.1021/bk-2011-1079
17. C. Polonschii, S. Tombelli, S. David, M. Mascini, M. Gheorghiu*, A novel low-cost and easy to develop functionalization platform. Case study: aptamer based detection of thrombin by surface plasmon resonance, *Talanta* 80 (2010) 2157–2164
18. E. Gheorghiu, M. Gheorghiu, S. David, C. Polonschii, "Biodysensing: sensing through dynamics of hybrid affinity / cellular platforms; towards appraisal of Environmental and Biological Risks of Nanobiotechnology" in *Silicon Versus Carbon Fundamental Nanoprocesses, Nanobiotechnology and Risks Assessment, Series: NATO Science for Peace and Security Series, Magarshak, Y.; Kozyrev, S.; Vaseashta, A. K. (Eds.)* (2009)
19. A.Olaru, M. Gheorghiu, S. David, T. Wohland, E. Gheorghiu, Assessment of the multiphase interaction between a membrane disrupting peptide and a lipid membrane, *J. Phys Chem B* (2009), 113, 14369–14380
20. M. Gheorghiu, A. Olaru, A. Tar, C. Polonschii, E. Gheorghiu, Sensing based on assessment of non-monotonous effect determined by target analyte: case study on pore forming compounds, *Biosens. Bioelectron.* 24 (2009) 3517–3523
21. M. Gheorghiu, S. David, C. Polonschii, E. Gheorghiu "Sensing at nanoscale via structured interfaces" *Eur Biophys J.* (2007) 36 S157
22. A. Ursu, M. Gheorghiu, S. David, E. Gheorghiu Sensing the cell- substrate interaction towards development of "smart" surfaces (2007) IFMBE Proceedings, Ed. Springer, vol 17, pp 106-109
23. S. David, M. Gheorghiu, C. Polonschii, E. Gheorghiu "Dual SPR-Impedance Measurement System for detection of bioaffinity interactions", (2007) IFMBE Proceedings, Ed. Springer, vol 17; pp 86-89
24. M.Gheorghiu, S. David, C. Polonschii, D. Bratu, E. Gheorghiu, Biosensing and controlled interaction with cellular systems via structured interfaces. *Eur Cells Mat.* Vol.14.S.3, (2007) 63
25. M. Gheorghiu, W. Van Driessche, Modeling of basolateral ATP release induced by hypotonic treatment in A6 cells, *Eur Biophys J.* (2004) vol 33 No 5, 412-420
26. M. Gheorghiu, E. Gersing, Revealing alteration of membrane structures during ischemia using impedance spectroscopy, *J. Sci Tech* vol 24 S. (2003) Membrane Sci.&Tech. 791-797
27. E. Gheorghiu, D. Andreescu, M. Oporanu, M. Gheorghiu, S. Cazacu, C. Balut, A. Ursu Impedance Spectroscopy in Biodynamics: Detection of Specific cells (pathogens) using immune coated electrodes, *J. Sci Tech* vol 24 Suppl (2003) Membrane Sci.&Tech. 777-784

28. Sadik, H. Wu, E. Gheorghiu, D. Andreescu, C.M. Balut, M. Gheorghiu, D. Bratu, Differential Impedance Spectroscopy for Monitoring Protein Immobilization and Antibody–Antigen Reactions, *Analytical Chemistry*, 74 (2002), 3142-3150
29. E. Gheorghiu, C. Balut, M. Gheorghiu, Dielectric behaviour of Gap Junction Connected cells: a Microscopic Approach, *Phys Med. Biol.*, 47 No 2 (2002) 341-348
30. M. Gheorghiu, E. Gersing, E. Gheorghiu, Quantitative analysis of impedance spectra of organs during ischemia, *Ann. New York Academy Sci.* 873, (1999) 65-71
31. M. Mehedintu, H. Berg, Proliferation response of yeast *Saccharomyces cerevisiae* on electromagnetic field parameters, *Bioelectrochem. Bioener.*, 43, 67-70, (1997)
32. M. Mihai, M. Mehedintu, E. Gheorghiu, The derivation of cellular properties from dielectric spectroscopy data, *Bioelectrochem. Bioener.*, vol. 40, 187-192 (1996)
33. M. Mehedintu, C. M. Mihai, E. Gheorghiu, Fast, in flux, procedure to measure and preserve the growth medium parameters, *Bioelectrochem. Bioener.*, vol. 40, 181-185 (1996).

Patente

[1] RO patent no. 117877/30.09.2004: “Method for detecting target analytes in liquid media”; [2] RO patent no. 117986/30.09.2004: “Fast, high accurate method to measure impedances in ac sinusoidal current”; [3] RO patent no. 120867/30.08.2007: “Quantitative assessment of (bio)sensors by analysis of nonlinear frequency response”; [4] RO patent no. 120790/30.08.2007: „Method for determining analytes by analyzing the polarization impedance of the transducer/sample interface”.

Participare la conferinta international

Prezentari invitate

[1]. “Electro-Optical flow-through system to appraise cell dynamics”, Mihaela Gheorghiu *Open Problems in Systems Chemistry* January 23- 24, (2012), Montpellier, France [2] “Advanced electro-optical and SPM approaches in probing and development of cellular platforms for sensing” M. Gheorghiu – International Workshop on Cell Physiology and Biosensors, Hasselt, Belgium, December, 11-12, (2008) [3]. “New avenues, “hot topics” in Biodysensing”, Montpellier (2006); [4] “On the electrode related problems in bioimpedance measurements”, NUS (2005) [5] ”Anti-angiogenesis effect of Somatostatin/analogues: case study – hepatocellular carcinoma” M. Gheorghiu Novartis Young Investigators’ Meeting (YIM), Barcelona, Spain, January 28-30, (2005); [6] “Revealing alteration of membrane structures During Ischemia Using Impedance Spectroscopy”, M. Gheorghiu, Regional Symposium on Membrane Science and Technology, Songkhla, Thailand, (2003)

Prezentari orale (selectie)

[7] “Advanced electro-optical analytical platform for dynamic evaluation of cell-surface and cell-cell interactions” at World Congress on Biosensors (2014), 27-30 May, 2014, Melbourne, Australia; [8] “Dynamic assessment of Amyloid oligomers – cell membrane interaction by advanced impedance spectroscopy” XVth Intl Conference on Electrical Bio-impedance & XIVth Conference on Electrical Impedance Tomography, 22-25 April Heilbad Heiligenstadt, Germany (2013) [9] “Quantitative insights into the complex interaction process between antimicrobial peptides and membranes”, M. Gheorghiu, XXth International Symposium on Bioelectrochemistry and Bioenergetics, May (2009) Sibiu, Romania; [10] The 10th World Congress on Biosensors May 14 - 16, Shanghai, China, (2008) [11] “Biological characterisation of nano-patterned bio-surfaces using time based impedance spectroscopy” M. Gheorghiu, S. David, C. Polonschii, E. Gheorghiu - ESF – EMBO Symposium Probing interactions between nanoparticles/biomaterials and biological systems – alternative approaches

to bio-toxicity Sant Feliu de Guixols, Spain, November (2007); [12]. “SPR Assays with Magnetic Actuation for the Immuno-Affinity Detection of Target Cells” M. Gheorghiu, S. David, C. Polonschii, E. Gheorghiu ESF-EMBO Symposium Biomagnetism and Magnetic Biosystems Based on Molecular Recognition Processes Sant Feliu de Guixols, Spain, September (2007); [13]. “Biosensing via structured interfaces at nanoscale” M. Gheorghiu, S. David, C. Polonschii, D. Bratu, E. Gheorghiu Molecular Plasmonics International Symposium Jena (Germany) 10-12 May (2007); [14]. “Dual SPR-Impedance Measurement System for detection of bioaffinity interactions”, S. David, M. Gheorghiu, C. Polonschii, E. Gheorghiu The 13th International Conference on Electrical Bioimpedance combined with the 8th Conference on Electrical Impedance Tomography, Graz, Austria, (2007); [15]. “Sensing the cell-substrate interaction towards development of “smart” surfaces” M. Gheorghiu, S. David, A. Ursu, E. Gheorghiu The 13th International Conference on Electrical Bioimpedance combined with the 8th Conference on Electrical Impedance Tomography, Graz, Austria, (2007); [16]. “Impedance spectroscopy interrogation of modified sensors for immuno-sensing” M. Gheorghiu, S. David, D. Bratu, E. Gheorghiu, XII International Conference on Electrical Bioimpedance & V Electrical Impedance Tomography, Gdansk, (2004); [17]. “IS on single cells: from modelling to fitting real data” E. Gheorghiu, C. Balut, M. Gheorghiu, XII International Conference on Electrical Bioimpedance & V Electrical Impedance Tomography, Gdansk, (2004); [18]. “On the quantitative evaluation of the time course of tissue impedance during ischemia” Mihaela Gheorghiu, Eberhard Gersing, Eugen Gheorghiu, XII international conference on electrical bio-impedance, Oslo Norway 17-21 June (2001); [19]. “Ischemic tissue characterization using hybrid equivalent circuits – towards a comprehensive equivalent model”: Mihaela Gheorghiu, Eberhard Gersing 1 st International Conference on Dielectric Spectroscopy in Physical, Chemical and Biological Applications, DS 2001 (2001), Jerusalem, Israel.

Postere (selectie)

FEBS EMBO 2014 Conference, Paris, France, 30 August - 4 September 2014; Gordon Research Conference, Bionterface Science (2008); SPM in Biology, Berlin (2008); Biosensors Congress; Shanghai, (2008); European Biophysics Congress, (2007); Integration Workshop Physics of Sensors and. Detection Systems ISPRA, (2006); Biosensors Congress Granada, (2004)

18.11.2016

Mihaela Gheorghiu