

PLATFORME CELULARE CU POTENTIAL IN EVALUAREA RISCURILOR IN NANOTEHNOLOGIE



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Cuprins



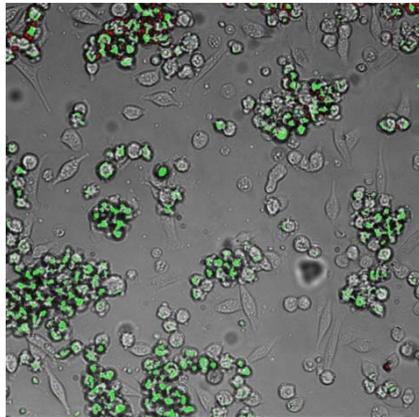
- De ce e nevoie de platforme celulare pentru evaluarea riscurilor in nanotehnologie?
- Metode utilizate
 - Spectroscopia de impedanta
 - Rezonanta Plasmonilor de suprafata &
 - Microscopia de fluorescenta (Reflexie totala interna & Epi fluorescenta)
- Facilitati suport
- Rezultate Recente
- Concluzii



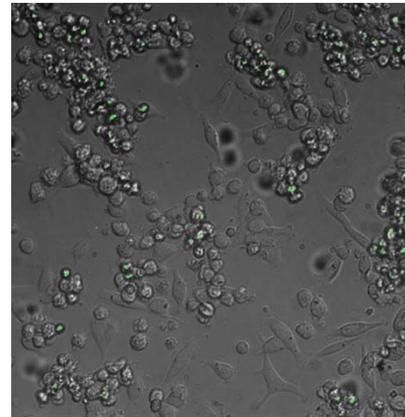


Interactia celula-mediu influenteaza dinamica celulara

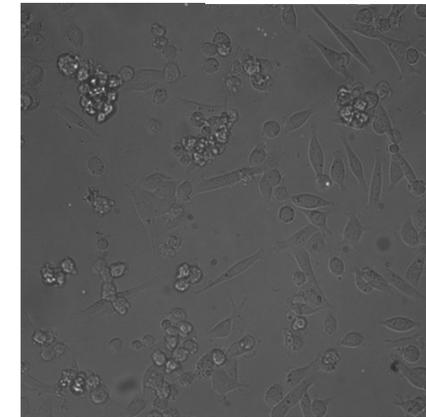
- Comunicarea celula celula
- Distributia celulelor



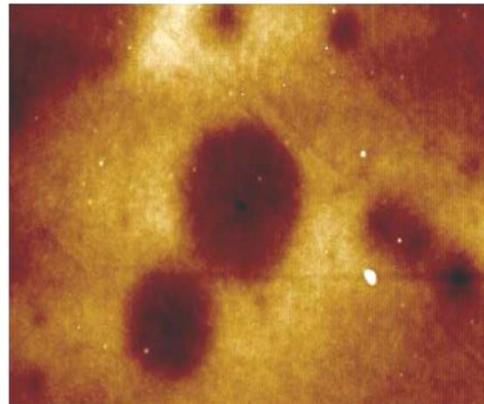
control



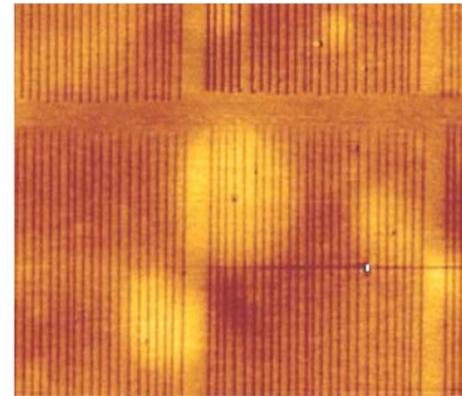
E-beam



AFM



control



modified

AFM

E-beam
lithography

16 mai 2013



Scop



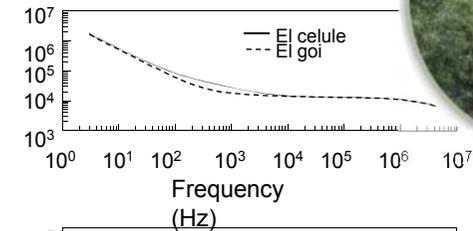
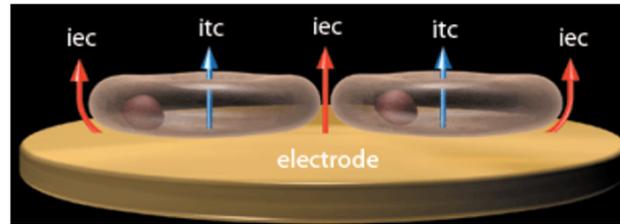
- **Dezvoltarea platformelor celulare este o prioritate a momentului oferind o alternativa rapida si eficienta pentru evaluarea impactului nanomaterialelor asupra sistemelor biologice.**
- **Acestea permit:**
 - Analize de cinetica – monitorizarea in timp real a evenimentelor (moleculare) la nivel celular
 - Studii multiparametrice pe celule vii
 - Evaluarea mecanismelor de interactie si a efectelor blande, ne-letale
 - Eliminarea problemelor de Bio-Etica (alternativa la testele pe animale)
- **Etape:**
 - Dezvoltarea platformelor de analiza
 - Dezvoltarea metodelor de bioanaliza/sensing
 - Identificarea procedurilor de validare si control
- **Focus: Caracteristicile Fizico-chimice, *In Vitro* Assays (celulare si non-celulare).**



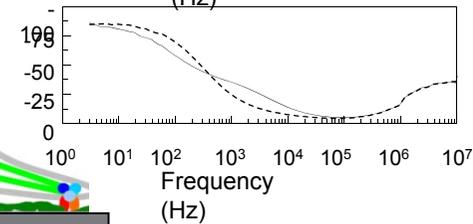
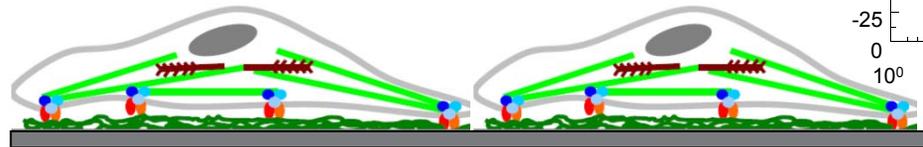
Tehnici de masura



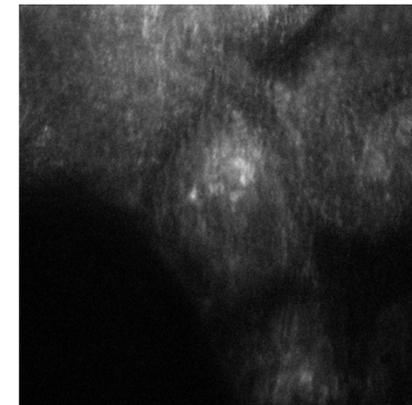
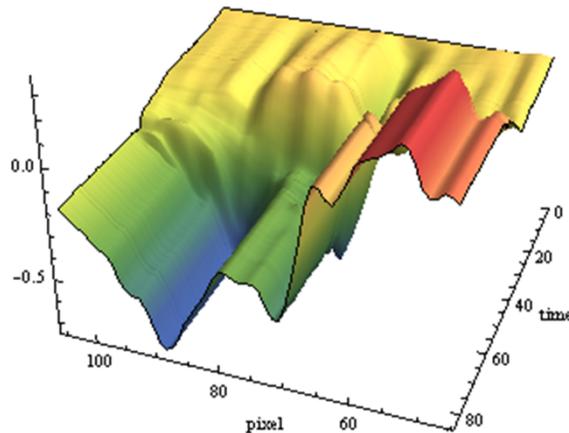
- IS



- SPR



- TIRFM

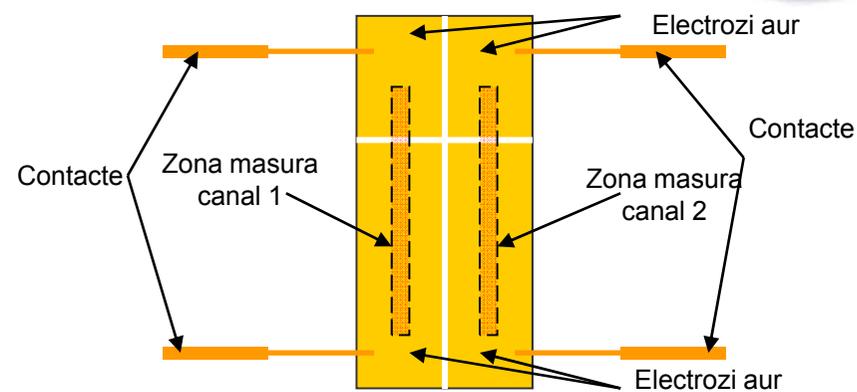
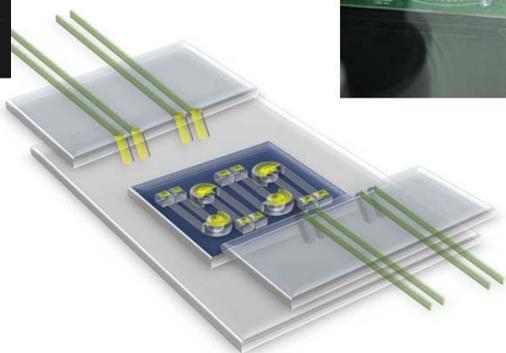
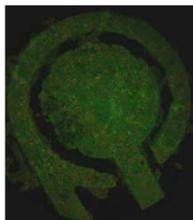


S. Andreescu, M. Gheorghiu, R. E. Ozel, K. Wallace Methodologies for Toxicity Monitoring and Nanotechnology Risk Assessment, chapter 7 in ACS books series "Biotechnology and Nanotechnology Risk Assessment: Minding and Managing the Potential Threats around Us" Editor(s) Steven Ripp and Theodore B. Henry, Vol 1079 (2011) DOI: 10.1021/bk-2011-1079

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 (2009)



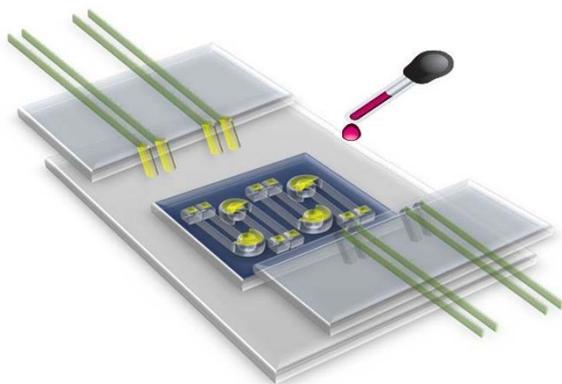
Platforme analitice



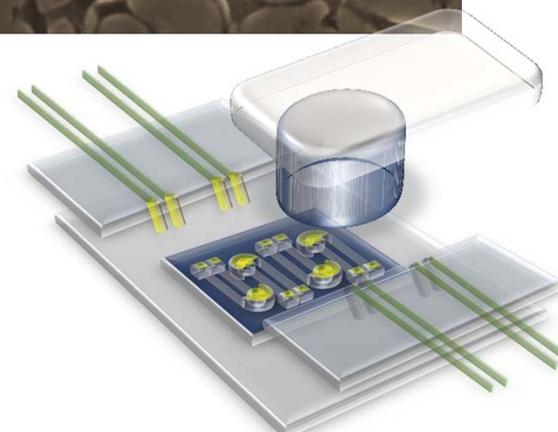
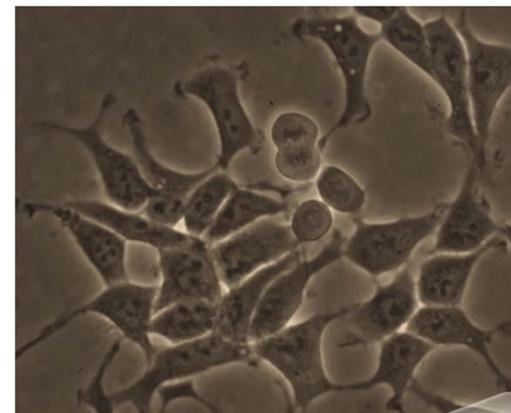
Celule model



Celule epiteliale model



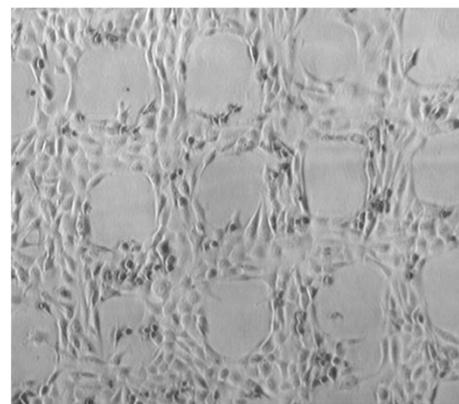
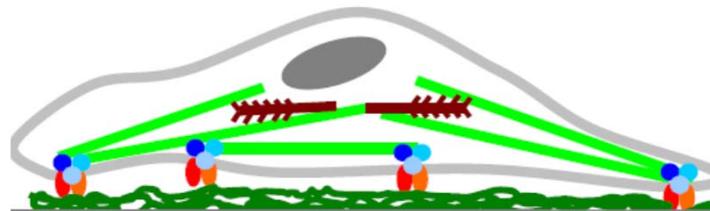
Celule cu transfectie
Stabila de canale sensibile la lumina



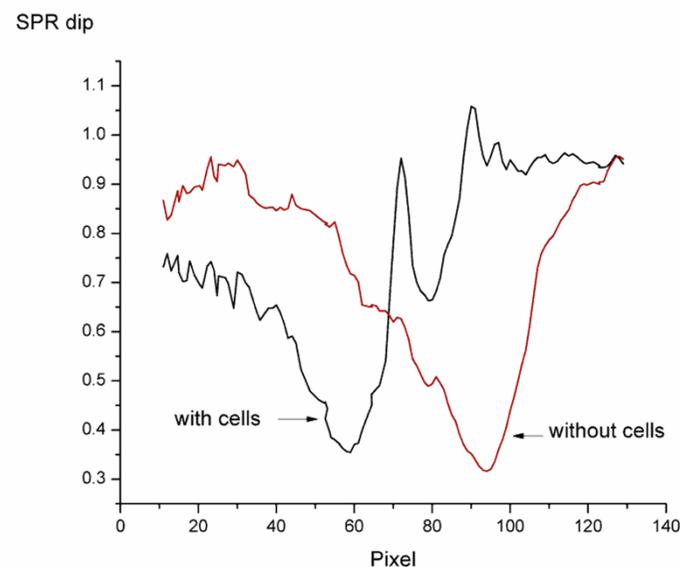
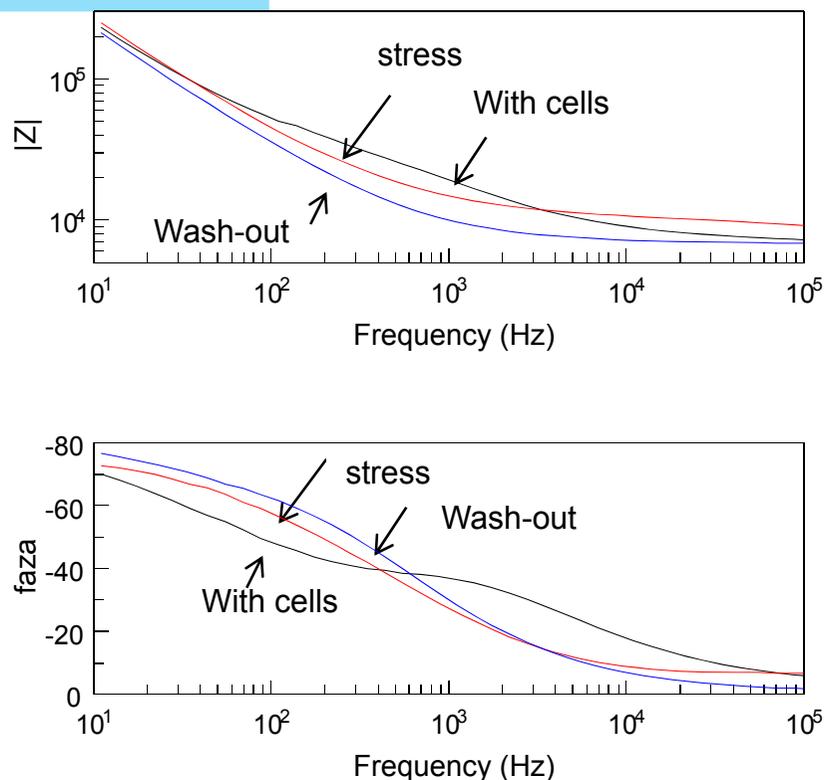
HEK 293 – clone cu ChRh2, Ca, K
T. Badea, M. Ghinia, V. Gradinaru, O. Popescu



Facilitati suport



Rezultate



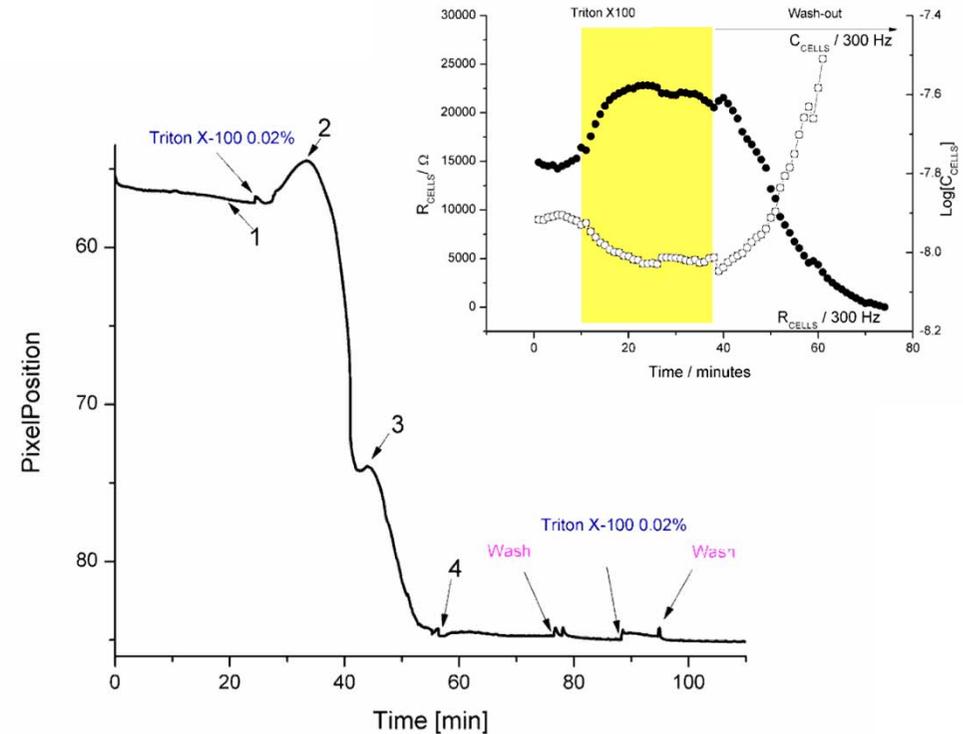
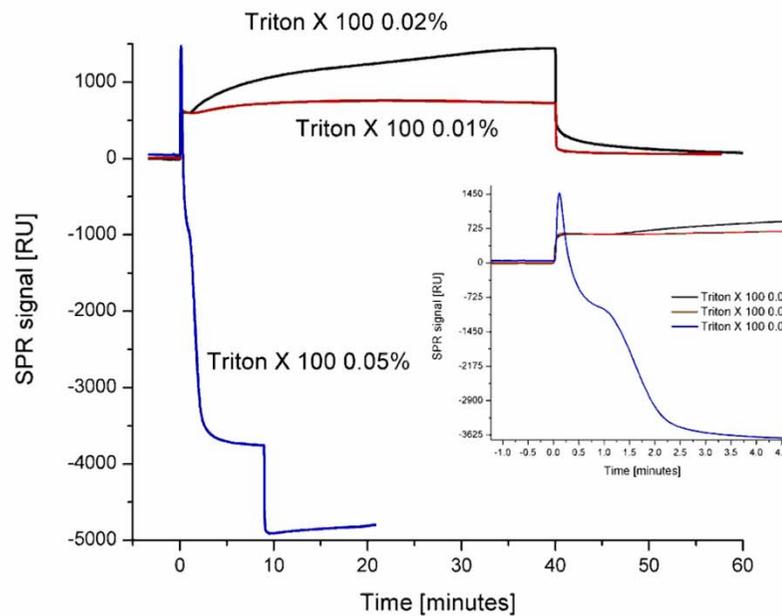
M. Gheorghiu, C. Polonschii, S. David, A. Olaru, E. Gheorghiu, SPR Bioanalytical platform to appraise the interaction between antimicrobial peptides and lipid membranes, In Optical Nano- and Microsystems for Bioanalytics, Series Chemo- and Biosensors 10 (Series Editor Gerald Urban), Springer (2012) pp 183-210

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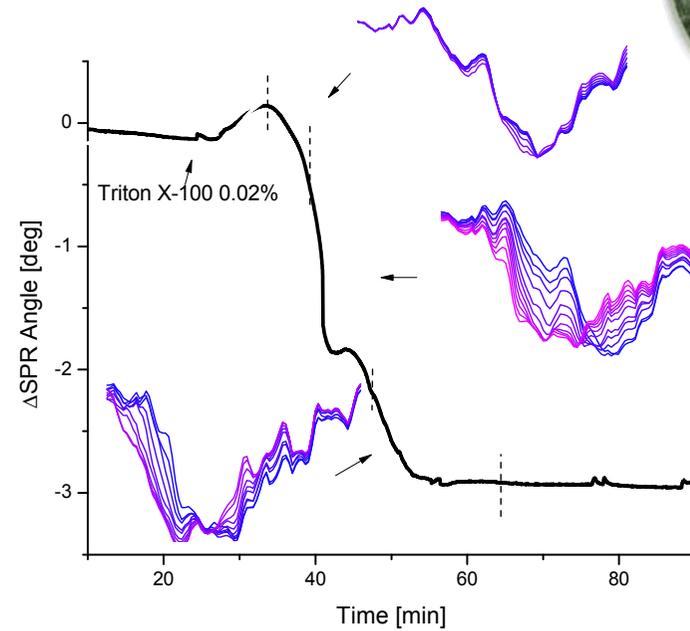
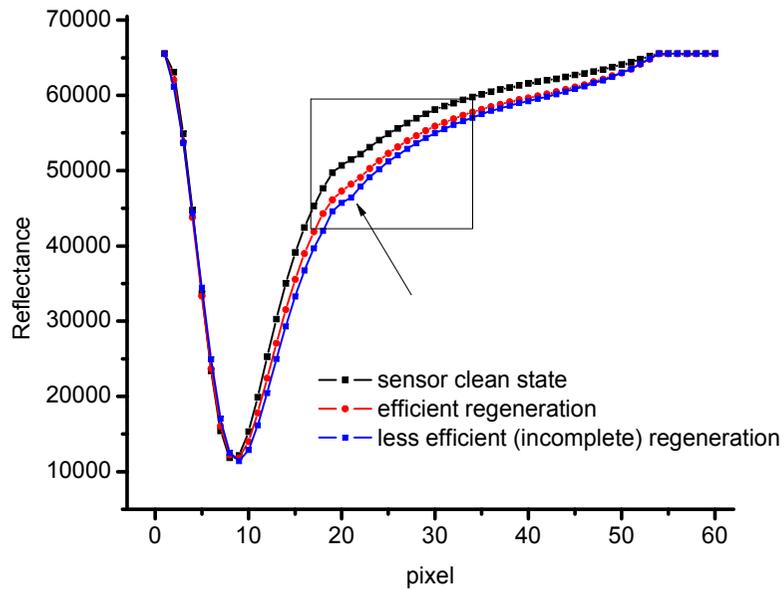
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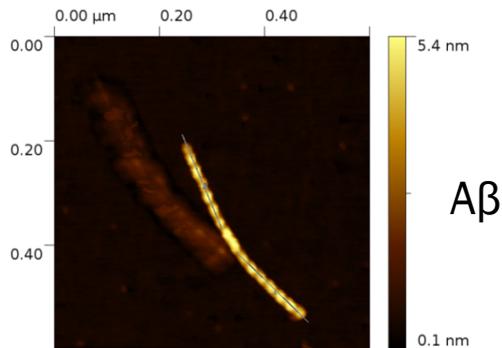
M. Gheorghiu, C. Polonschii, S. David, A. Olaru, E. Gheorghiu, SPR Bioanalytical platform to appraise the interaction between antimicrobial peptides and lipid membranes, In Optical Nano- and Microsystems for Bioanalytics, Series Chemo- and Biosensors 10 (Series Editor Gerald Urban), Springer (2012) pp 183-210



Rezultate



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

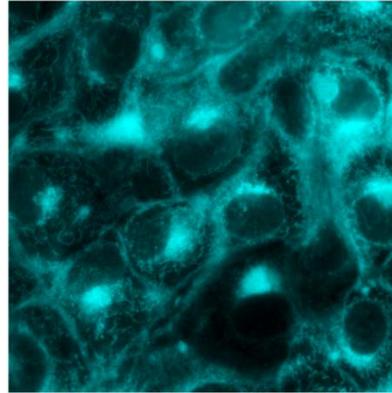
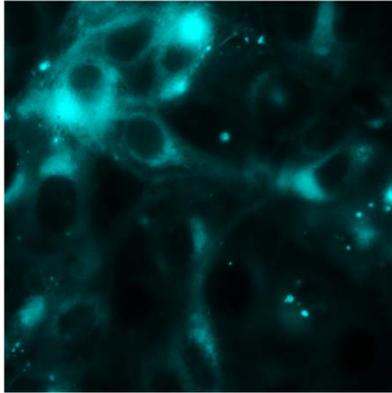


M. Gheorghiu, A-M Enciu, B.O. Popescu, E. Gheorghiu Functional and molecular characterization of $A\beta_{1-42}$ effect on barrier properties, *JAD* (2013) under review

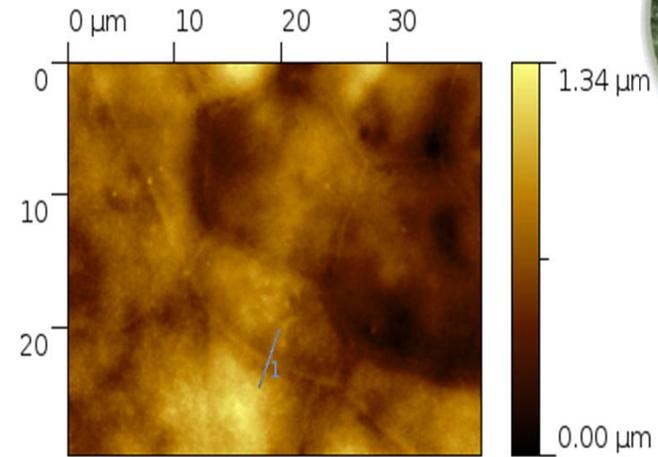
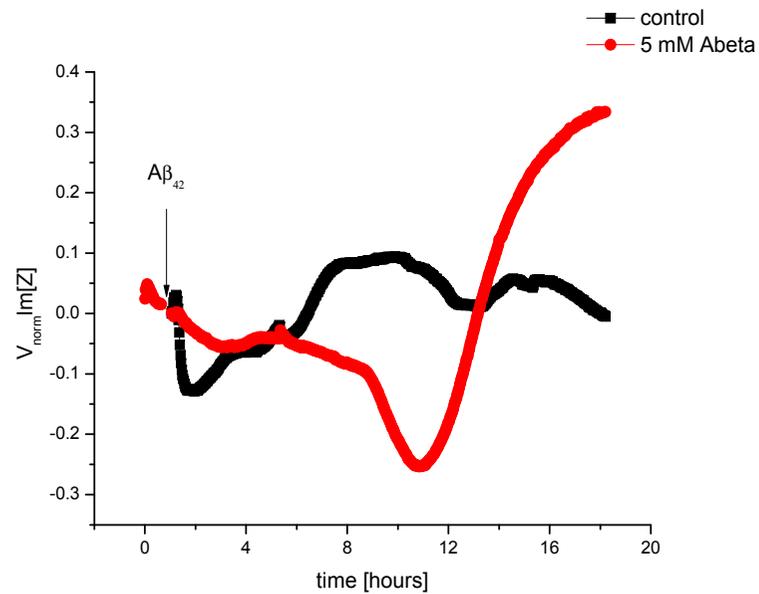
M. Gheorghiu, S. David, C. Polonschii, A. Olaru, S. Gaspar, O. Bajenaru, B. O. Popescu, E. Gheorghiu, Label free sensing platform for amyloid fibrils effect on living cells and bio-mimetic membranes, (2013) submitted



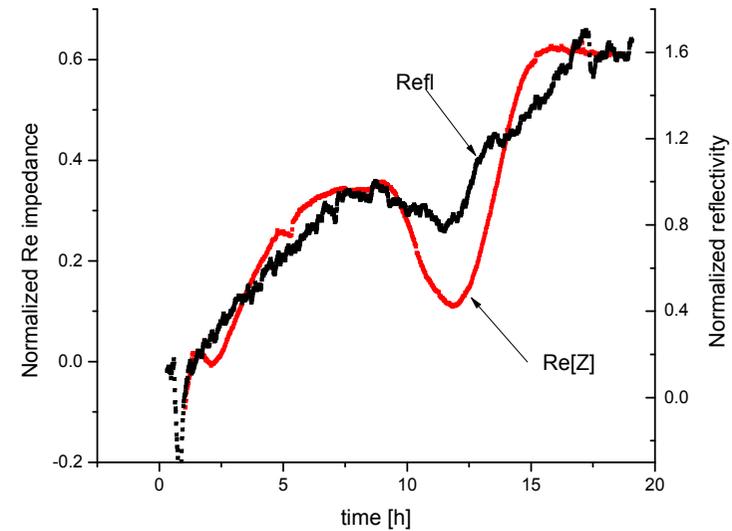
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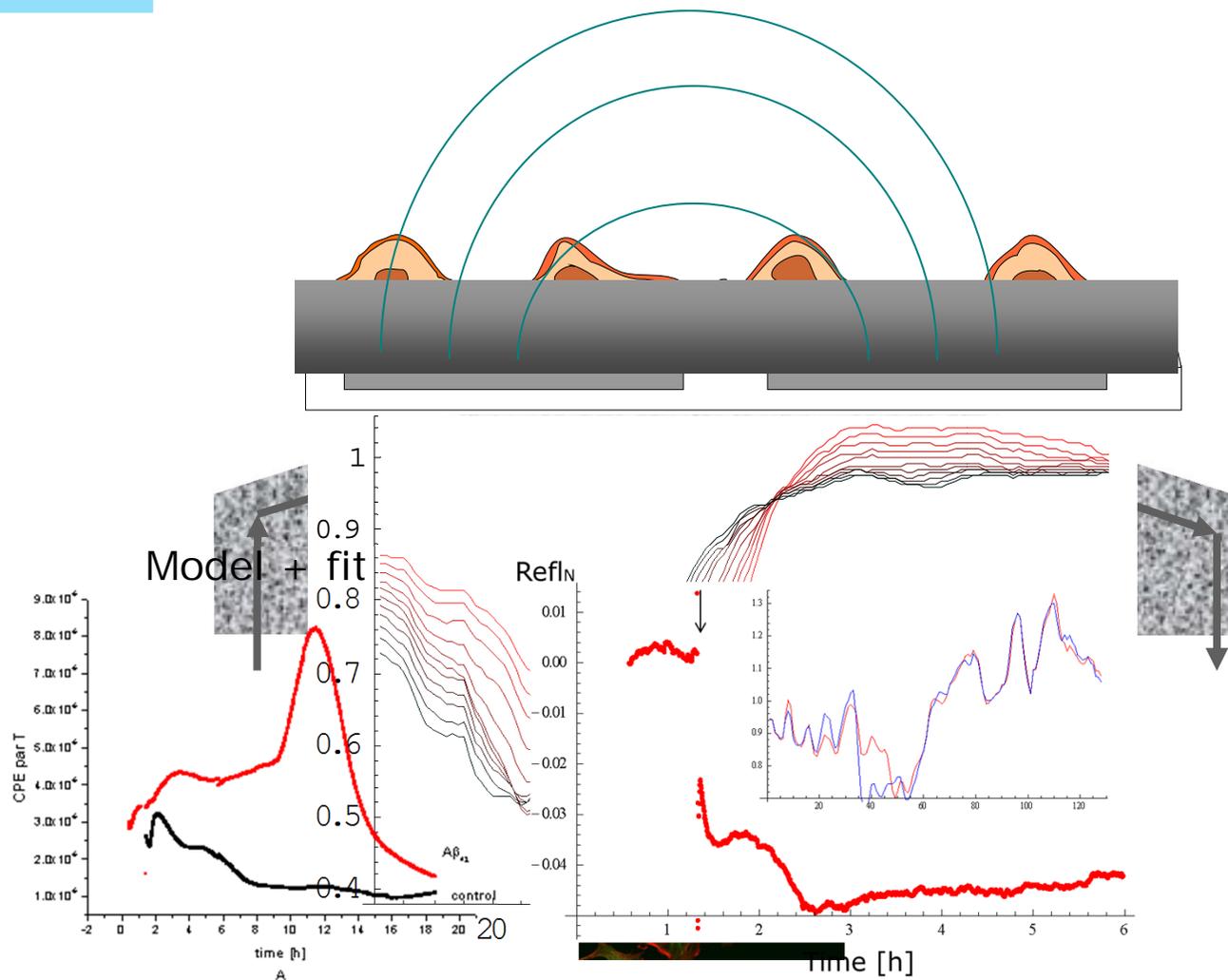
Modificari ale Fluiditatii membranare



Modificari ale structurii jonctiunilor



Concluzii



BIOSCOPE - Contract No. 11/2012, ID: PN II-ID-PCCE-2011-2-0075

Electro-Plasmonics for the analysis of the dynamics of cellular processes and biomolecular interactions

