

E 11: NANOMEDICINE

Leader Group: Prof.Dr.Rodica-Mariana Ion

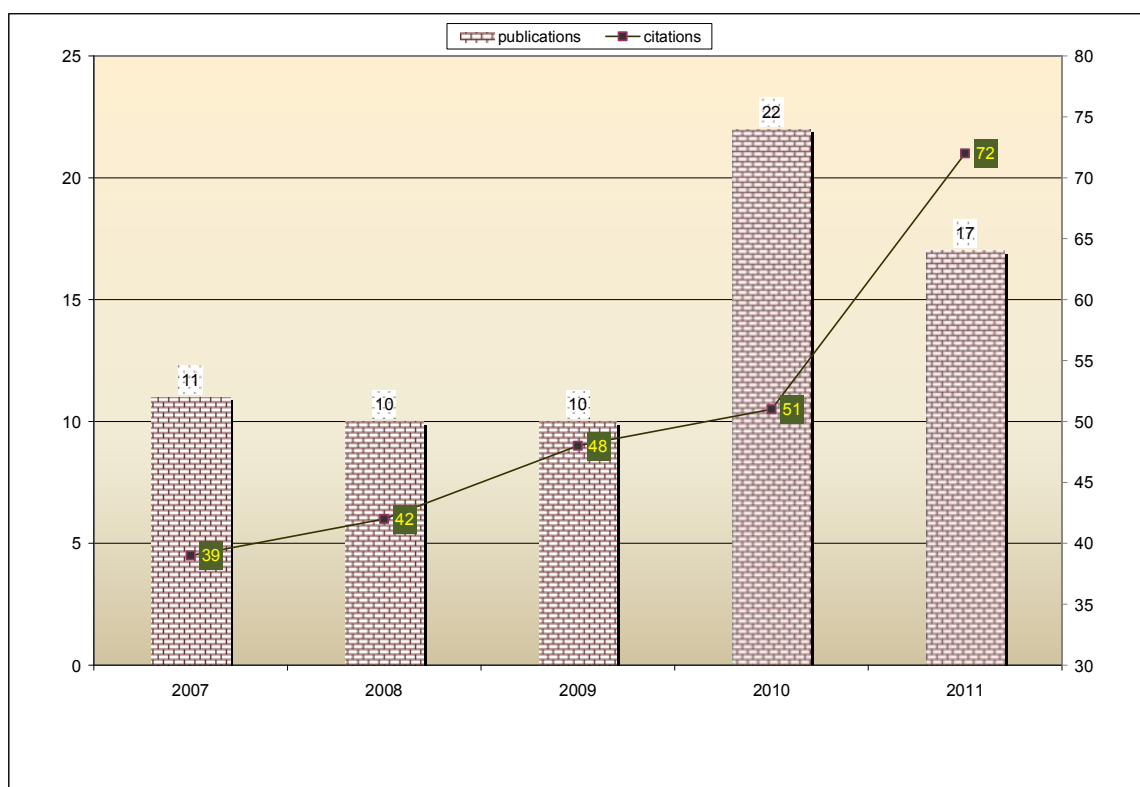
Short description of the research domain

The research area of the Nanomedicine Group, lead by Professor Rodica-Mariana Ion is focused on:

- ☑ the development of novel tools that combine nanomaterials, optics and photochemistry to tackle diagnostic and measurement problems in biomedicine (detection, diagnosis and treatment of human disease, and photodynamic therapy (PDT, a treatment involving sensitizing tissue with photosensitizing drugs which are then activated by laser light);
- ☑ the exploration of the potential and mechanisms of PDT, minimally invasive approach in diagnosis and treatment of Skin Cancer, preclinical study and the photobleaching of photosensitizers;
- ☑ The entire research activity of the team is documented by more than 200 publications in international reviews, has been devoted to the development of laser systems for applications in biology and medicine.

The **Nanomedicine** Group:

- ☑ Promotes the science, technology, and innovation of delivery of bioactives using nanoscale constructs.
- ☑ Research in our laboratory focuses on the design, synthesis and characterization of biomedical compounds: porphyrins, phthalocyanines, nanostructures as fullerenes, carbon nanotubes, so on.
- ☑ Lead independent research projects that are described at this site. They also actively collaborate and support a joint nanomedicine group seminar to foster creative environment, exchange of ideas, and interdisciplinary education of students and postdoctoral scientists.

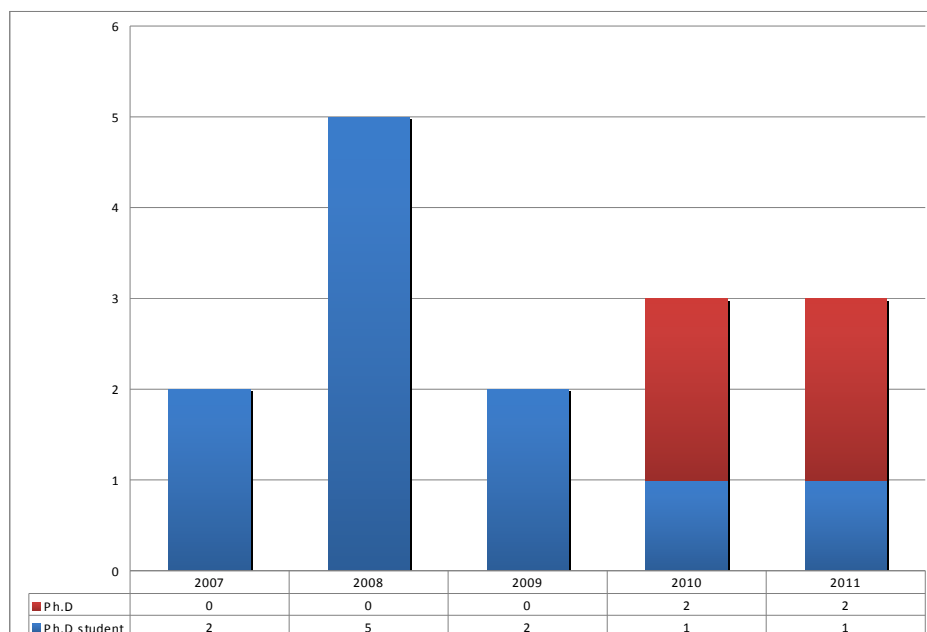


Evolution of publications and citations from 2007 to 2011

Research direction enlargement

- ☑ Nanotechnology has generated a significant impact in nearly every aspect of science. Our research seeks novel nanomaterials and nanotechnologies in order to develop advanced drug delivery systems with the promise to improve health care.
- ☑ Highly interdisciplinary and translational, our research is focused on multifunctional, nanoparticle-based drug delivery systems.

- ☑ We seek to improve nanoparticle synthesis and formulation and its therapeutic efficacy.
- ☑ Develop a fundamental understanding of the interface between nanomaterials and the biological system, all in order to aid in nanoparticle drug development.
- ☑ Develop of a porphyrins nanomaterials school for Ph.D. students



New area of research explored

The instrumentation developed has been also used for diagnostic purposes and restoration /preventive conservation on art works in Cultural Heritage.

New interdisciplinary initiatives

Based on analytical techniques and nanomaterials experience, the group has broadened its scope of competence in the chemical restoration and biological disinfection of paper or textile artifacts.

Visibility actions

International Programs

1. Project FP6 - Development of high throughput approaches to optimize the nutritional value of crops and crop-based foods – DEVELONUTRI
<http://www.scri.ac.uk/research/ppfq/foodquality/foodsafety/develonutri>
2. EuCheMS platform (European Association for Chemistry for Life Science)
<http://www.euchems.org/CFECS/location.cfm>
3. SusChem Platform (European Technology Platform For Sustainable Chemistry)
http://www.suschem.org/en/_related/links-to-national-platforms-or-contact-points
4. COST D39 - "Metallo-Drug design and action"
http://w3.cost.esf.org/index.php?id=189&action_number=D39
5. COST D20/WG0012/02 "New Molecular systems with therapeutic applications in photodynamic therapy of cancer and microbial infections"
http://w3.cost.esf.org/index.php?id=189&action_number=D20
6. COST D18/0003/00 "Lanthanides in diagnosis (in vivo and in vitro)"
http://www.cost.esf.org/domains_actions/cmst/Actions/Lanthanide_Chemistry_Diagnosis_Therapy
7. COST TD1002 "European network on applications of Atomic Force Microscopy to NanoMedicine and Life Sciences (AFM4NanoMed&Bio)"
http://www.cost.esf.org/domains_actions/bmbs/Actions/TD1002

Awards

1. Gold Metal – Romanian Award from the Research Ministry for the Project CEEEX 18/2005, Health area, 2008

2. EUREKA Innova Brussels – Gold metal for a patent request, 2008
3. Prize of Rudy Demotte, Minister President of the Walloon Government – EUREKA Innova Brussels – First prize for the patent request 2008
4. Gold metal with Congratulations of Jury for a patent request, Geneva, 37th Salon of Inventions, 2009;
5. Special prize of Russian Ministry of Science and Education for a patent request, 2009;
6. Excellence Diploma and Silver Medal at PRO INVENT, organized by ExpoTransilvania, Cluj, 2009
7. Award “Best Scientist of the year 2010”, Dinu Patriciu Foundation, Bucharest, Romania;
8. Silver medal at iENA 2010, Nurnberg, Germany;
9. Special Prize and Excellency Diploma from Inventors Organization, Taiwan, iENA 2010, Nurnberg;
10. Excellency medal from Romanian Authority of Scientific Research, for participation at iENA 2010, Nurnberg
11. Gold Medal at 39th Salon of inventions, Genève, 2011;
12. Special Award at 39th Salon of inventions, Genève, 2011;
13. Gold medal at International Salon of Inventions, ARCA, Zagreb, Croatia, 2011
14. Gold Medal at IWIS (Polish Inventions Association), Warsaw, 2011;
15. Gold medal at the 60th Inventions Salon “Innova” – Bruxelles 2011;
16. Special Award from Poland received at the 60th Inventions Salon “Innova” – Bruxelles 2011;
17. Award of the Innova Contest Bruxelles, at the 60th Inventions Salon “Innova” – Bruxelles 2011.

Organization of international conferences

1. 2nd European Conference on Life Sciences, Wroclaw, Poland, 04-08 September 2007
2. 4th European Conference on Life Sciences, Budapest, 31 august-03 September 2011
3. Scientific Committee of International Symposium on Understanding Intelligent and Complex Systems, UICS’2009, Targu Mures, 22-23 October 2009; <http://uics.upm.ro>

Memberships to Editorials Boards of International Journals

1. International J.Photoenergy, 2011 “Photomedicine and Photo Nanosystems”, Guest Editors: Rodica-Mariana Ion, Tebello Nyokong, G. Gyulhandanyan, Danuta Wrobel; Manuscript Due: May 15, 2011; Publication Date: November 15, ISSN: 1110-662X; e-ISSN: 1687-529X; doi:10.1155/IJP2011; <http://www.hindawi.com/journals/ijp/osi.html>
2. BRAIN. Broad Research in Artificial Intelligence and Neuroscience, ISSN 2067-3957, volume 1, October 2010, Special Issue on Advances in Applied Sciences, Eds Barna Iantovics, Marius Mărușter, Rodica-M. Ion, Roumen Kountchev;
3. Editorial Team of Journal of Biophysics and Structural Biology, <http://www.academicjournals.org/JBSB/Email.htm>
4. Editor at Journal of Cancer Research and Experimental Oncology; <http://www.academicjournals.org/jcreo/Editors.htm>