

Multifunctional Nanoparticles for Magnetic Hyperthermia and Indirect Radiation Therapy (RADIOMAG)

<http://cost-radiomag.eu/>



Welcome to the April 2018 issue of the RADIOMAG newsletter!

NEWS

Annual Action Progress Conference & MC meeting, in Timisoara, Romania (22nd-23rd March)



Venue: The Library of Politehnica University of Timisoara

The meeting at a glance

- 73 colleagues from 18 out of 24 RADIOMAG countries and 2 observer countries participated.
- 5 invited lectures were given by: Ekaterina Elfimova, Victor Kuncser, Silvie Meeuwissen, Stéphane Roux and Arne Skjeltorp covering theoretical aspects of MNPs and MFH, GMP manufacture of MNPs for clinical trials, development magnetic nanoflowers for image-guided RT and magnets for MNP manipulation.
- A special session was dedicated to international standardisation of MNP, organised by colleagues from MagNaStand.
- Individual WG meetings & plenary discussions were held
- WG leader progress report
- Following scientific strategy for the next Grant Period was agreed on:
 - Exchange know-how, experience and RADIOMAG results to specialized public and for network building through
 - Joint publications & research proposals
 - MagMeet participation: Guidelines on preclinical testing
 - Final Action meeting & Action Dissemination
 - Finish guidelines for SAR measurements, in order to set up a future technical report for the ISO committee on MNP performance measurements.

The new Work + Budget plan, which foresees a final Action meeting, participation in a dissemination meeting and 6 ITC conference grants was discussed.

NEW MEMBERS

We have new members joining our COST action. Welcome!

Magdalena Radovic (WG3) VINCA institute for Nuclear Sciences, University of Belgrade, Serbia.

Borja Herrero, University of the Basque country, Spain.

FUNDING OPPORTUNITIES

M-ERA.NET CALL 2018, deadline for submission is 12 June 2018, 12:00 noon (Brussels time). More information is available here:

<https://m-era.net/joint-calls/joint-call-2018>.

Marie Curie Individual Fellowships application is now open. More information at:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/msca-if-2018.html>

CONFERENCES AND EVENTS

- The 12th International Conference on the Scientific and Clinical Applications of Magnetic Carriers (**Magmeet**) will be held in Copenhagen, Denmark, 22 - 26th May.
- **E-MRS Symposium on NANOMEDICINE**, in Strasbourg, France 20 - 22nd June.
- **Nanotech France 2018** will take place in Paris, France 27 - 29th June.
- **Intermag 2018**, Singapore, 23rd-27th April.

BOOKS, DOCUMENTS and THESES

- A new book has been released on "**Clinical Applications of Magnetic Nanoparticles**" with the contributions of numerous RADIOMAG members. The book is edited by Prof. Nguyen and published by CRC Press is now available.
- D. Cabrera, I. Rubia-Rodríguez, E. Garaio, F. Plazaola, L. Dupré, N. Farrow, F. J. Terán, and D. Ortega have written a book chapter entitled "**Instrumentation for magnetic hyperthermia**", in **Nanomaterials for Magnetic and Optical Hyperthermia Applications** edited by Raluca Fratila and Jesús Martínez de la Fuente and published by Elsevier.
- D. Stanicki, L. Vander Elst, R. N. Muller, S. Laurent, D. Felder-Flesch, D. Mertz, A. Parat, S. Begin-Colin, G. Cotin, J-M. Greneche, O. Ersen, B. Pichon, V. Socoliuc, V. Kuncser, R. Turcu, L. Vékás, P. Foster and R. Bartha have written a book chapter entitled "**Iron-oxide Nanoparticle-based Contrast Agents**" in **Contrast Agents for MRI: Experimental Methods** edited by Valérie C Pierre and Matthew J Allen and published by RSC-Publishing- Royal Society of Chemistry.

INVITATION TO PUBLISH IN SPECIAL ISSUE

Olivier Sandre has been invited to guest edit an issue of **Nanomaterials**, an MDPI open-access journal, which will focus on "*Magnetic Nanoparticles in Biological Applications*". If you would like to contribute to the journal's special issue, please, contact Olivier (olivier.sandre@enscbp.fr) or find more information at:

http://www.mdpi.com/journal/nanomaterials/special_issues/magnetic_nano_biol_application

PUBLICATIONS

Below are listed some of the more recent publications related to the general field of magnetic hyperthermia that were published by members of our action. (If your publication is not listed here, feel free to submit it through the relevant section in the RADIOMAG website.)

- Illés E., Szekeres M., Tóth I. Y., Szabó A., Iván B., Turcu R., Vékás L., Zupkó I., Jaics G., Tombác E. (2018) Multifunctional PEG-carboxylate copolymer coated superparamagnetic iron oxide nanoparticles for biomedical application, Journal of Magnetism and Magnetic Materials 451: 710–720.
- Khmara I., Kubovcikova M., Koneracka M., Kalska-Szostko B., Zavisova V., Antal I., Rajnak M., Dankova Z., Kavcansky V., Omastova M., Kopcansky P. (2018) Preparation and characterization of magnetic nanoparticles. Acta Physica Polonica 133: 704-706
- Hachani R., Birchall M., Lowdell M., Kasparis G., Manshian B., Soenen S. J., Gsell W., Himmelreich U., Gharagouzloo C. A., Sridhar S., Tung L. D., Thanh N. T. K. (2017) Assessing cell-nanoparticle interactions by high content imaging of biocompatible iron oxide nanoparticles as potential contrast agents for magnetic resonance imaging. Scientific Reports. 7: 7850
- Babič M., Horák D., Molčan M., Timko M. (2017) Heat generation of surface-modified magnetic γ -Fe₂O₃ nanoparticles in applied alternating magnetic field Phys. D: Appl. Phys. 50: 345002
- Szekeres M., Tóth I. Y., Turcu R., Tombác E. (2017) The effect of polycarboxylate shell of magnetite nanoparticles on protein corona formation in blood plasma, Journal of Magnetism and Magnetic Materials. 427: 95-99
- David Cabrera, Annelies Coene, Jonathan Leljaert Emilio J. Artés-Ibáñez, Luc Dupré, Neil D. Telling, and Francisco J. Teran. Dynamical Magnetic Response of Iron Oxide Nanoparticles Inside Live Cells. ACS Nano (2018) 12 (3), pp 2741–2752

DISSEMINATION

In May 2018, Spiridon Spirou (Sismanoglio General Hospital of Attica, Athens, Greece) will give an oral presentation entitled “Recommendations for *in vitro* and *in vivo* testing of Magnetic Nanoparticle Hyperthermia combined with Radiation Therapy” at the 12th International Conference on the Scientific and Clinical Applications of Magnetic Carriers (Magmeet). Sanja Vranjes-Duric and Drina Jankovic (VINCA institute for Nuclear Sciences, University of Belgrade, Serbia) will also present their posters at the conference, entitled “*In vivo* studies of phosphonate-coated magnetic nanoparticles labeled with technetium-99m” and “Labeling of phosphates-coated MNPs with yttrium-90: a potential tumour treatment radiopharmaceuticals”.

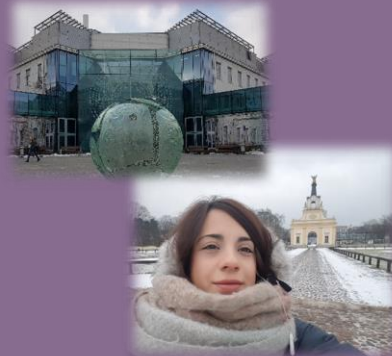
Short Term Scientific Missions

The grantees of the 9th Short Term Scientific Missions call are:

- **Erzsébet Illés** from the University of Szeged, Hungary.
- **Gallo Páramo** from International Iberian Nanotechnology Laboratory, Braga, Portugal.
- **Francis Pertou** from the University of Strasbourg, France.
- **Bogna Rudolf** from the University of Lodz, Poland.
- **Elena Sanz de Diego** from iMdea Nanociencia, Madrid, Spain.

Well done and good luck!

Maria Theodosiou, a PhD Candidate in Prof. Efthimiadou's laboratory (Greece) tells us about her STSM experience:



When my supervisor Prof. Eleni Efthimiadou suggested I should go to Dr. Beata Kalska-Szostko's laboratory at the Institute of Chemistry, University of Bialystok in Poland, I was excited. The concept of this short term scientific mission (STSM) was to characterize magnetic nanoparticle samples through Transmission Electron Microscopy (TEM) and X-Ray Diffraction spectroscopy (XRD). However, in the end it was more than that.

During the two weeks I spent in the laboratory I worked closely with Dr. Kalska-Szostko who was always eager to organise and discuss about the work I had to do there. She offered me a friendly environment to work in. I was really impressed by their brand-new equipment, which I had the chance to be introduced to and learn about the methodologies of XRD and TEM specifically for magnetic nanoparticles. Getting familiar with rules and practices of another laboratory proved to be beneficial for a young PhD student like me as there can always be something new to learn and adapt to my research. In the laboratory, I also worked with her PhD Student Urszula (Ula) Klekotka, with whom I ended up being not only colleagues but friends. Talking with a senior PhD student like Ula, made me realize that I still have a long way to go and patience is the key. Practicing my English in a scientific level was really challenging and helped me improve verbally.

Aside from the scientific experience, this STSM was also a social experiment, as I learned how to adapt on my own in another country, with different customs, life pace and climate. As a southerner it was really challenging for me in the beginning to deal with the cold weather of Poland, -7°C or even less some days, but I got used to it! I also had some free time so I visited this charming city as well as some villages around it and learnt a lot about their history. I have never lived in a country so cold, but I must say the people I met were really warm! Being part of this new laboratory and community broadened my horizons, increased my creativity and independency. It is safe to say now that this STSM was actually the beginning of an ongoing fruitful collaboration. All in all, it was an inspiring experience thanks to the people I met, both scientifically and socially.

FUTURE RADIOMAG EVENTS

RADIOMAG Annual Action Progress Conference & MC meeting in Florence, Italy, 17-18th October 2018.

Plenary type sessions will provide an overview of the latest research and common networking activities in RADIOMAG. During Working Group sessions the progress of specific tasks will be discussed.

ITC conference grants.

A new call of interest will be launched in April 2018.

WILLING TO JOIN US?

If you are an expert in radiation physics, radiology or instrumentation for magnetic hyperthermia, you can still join us by sending an email to: simo@meteo.be, or daniel.ortega@imdea.org