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New Probes | MRI and Multimodal II

Session chair: **Ulrich Flögel** - Dusseldorf, Germany; **Kristina Djanashvili** - Delft, The Netherlands

Shortcut: **PW-22**

Date: **Friday, 23 March, 2018, 11:30 AM**

Room: **Banquet Hall | level -1**

Session type: **Poster Session**

Abstract

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194 **Low-Molecular-Weight Iron Chelates are promising Alternatives to Gadolinium-based Contrast Agents for T1-weighted Contrast-enhanced MR Imaging** (#467)

A. Haeckel¹, P. Boehm-Sturm², J. Xie¹, R. Hauptmann¹, **E. Schellenberger**¹

202 **Spectroscopic and photoacoustic characterization of encapsulated iron oxide super-paramagnetic nanoparticles as a new multiplatform contrast agent** (#563)

P. Armanetti¹, A. Flori², C. Avigo¹, L. Conti³, B. Valtancoli³, D. Petroni¹, S. Doumet⁴, L. Cappiello⁴, C. Ravagli⁴, G. Baldi⁴, A. Bencini³, L. Menichetti¹

195 **A new class of paramagnetic contrast agents: synthesis and physicochemical characterizations of a fluorinated paramagnetic contrast agent** (#531)

E. Hequet¹, C. Henoumont¹, R. Muller^{1,2}, L. Vander Elst¹, S. Laurent^{1,2}

196 **Biocompatible Materials labelled with Microenvironment Responsive MRI Probes for the follow-up of Cell Transplants** (#153)

F. Capuana¹, S. Padovan², C. Grange³, V. Catanzaro⁴, J. C. Cutrin¹, M. Stevanovic⁵, N. Filipovic⁵, **G. Digilio**⁴

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Introduction

Cell encapsulation by hydrogels is intended to shield transplanted cells from the host hostile environment by preventing the infiltration of host immune cells. Cell scaffolding by solid biocompatible microparticles is intended to provide a structural support to implanted cells and to mimic the extracellular matrix, allowing cells to proliferate and/or differentiate in the desired way. We present strategies to label scaffolding biomaterials with microenvironment responsive MRI probes, for applications in the follow-up of cell transplants.

Methods

Microparticles (MPs) based on PLGA/chitosan were incorporated with gadolinium fluoride nanoparticles (GdNPs), as the MRI T₁-contrast agent. The system is designed such to release Gd-NPs in the extracellular matrix (ECM), thus activating MRI contrast, unless MPs are attacked by the immune system (Foreign Body Response, FBR). To proof the concept, PLGA-based MPs were seeded with hMSCs and implanted into either immunocompetent or immunocompromised mice, and the transplants were followed-up by MRI for three weeks. *Ex-vivo* histologic assessment was carried out at the end of the follow-up.

Results/Discussion

Immunocompetent mice showed poor activation, if any, of MRI contrast within the cell graft. Immunocompromised mice, on the other hand, showed a progressive activation of MRI contrast. *Ex-vivo* histology showed extensive FBR directed against microparticles in immunocompetent mice, with some surviving hMSCs in the ECM but not on the scaffold surface. No significant FBR was detected in immunocompromised mice, and hMSCs were still adhering to the scaffolds.

Conclusions

The proposed system is able to assess whether or not cell grafts are subjected to innate immune response, an event that is likely correlated to the loss of transplanted cells.

Acknowledgement

This work is supported by MAECI (PGR 02952 Italy and Serbia)

197 **Mesoporous silica nanoparticles functionalized with Gd-complexes and cyclooctyne groups for bioorthogonal targeting** (#455)

J. Martinelli¹, F. Carniato¹, D. Alberti², S. Geninatti Crich², C. Isidoro³, A. Lapadula³, **L. Tei**¹

198 **A novel probe for tumor imaging based on glycogen** (#409)

D. Jiráček¹, A. Gálisová¹, M. Jiratova¹, M. Rabyk², E. Sticova¹, M. Hrubý², M. Hájek¹

199 **Small-sized PEGylated iron oxide nanoparticles (IONP) for T₁-enhanced MRI**
(#89)

T. Vangijzegem¹, D. Stanicki¹, S. Boutry², Q. Paternoster¹, R. N. Muller^{1,2}, L. Vander Elst^{1,2}, S. Laurent^{1,2}

200 **Effects on nanoprobe biodistribution as a result of aging** (#308)

S. Plaza-García¹, P. Ramos-Cabrer^{1,3}, R. Piñol², J. L. Murillo², A. Millán², **S. Carregal-Romero**¹

201 **New MF1-Gadolinium complex as MRI contrast agents via green chemistry.**
(#72)

N. Dechsupa¹, J. Pommued¹, S. Phruankham¹, N. Ngasaman¹, A. Wankaew¹, J. Kantapan¹

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