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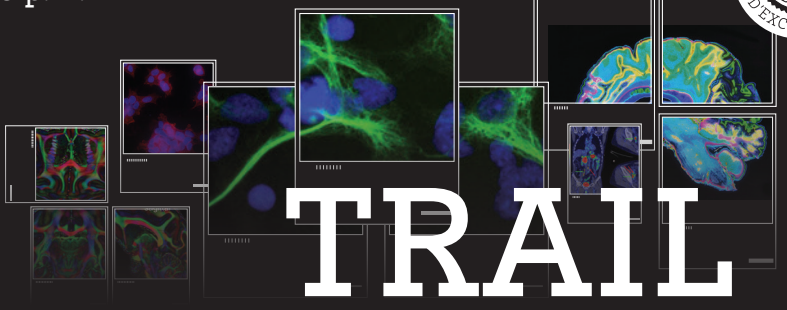

TRAIL

Translational Research and Advanced Imaging Laboratory

Conference

In vivo evaluation of calcium-responsive MRI probes

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IBIO Meeting room
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Tanja GAMBINO received a bachelor degree in physical chemistry from the University of Belgrade, and her Ph.D. degree from the University of Tübingen. She is currently a postdoc scientist in the MR Neuroimaging Agents research group at the Max Planck Institute for Biological Cybernetics in Tübingen. Her research interests include the characterisation and in vivo validation of bioresponsive molecular probes for functional MRI applications.

"In vivo evaluation of calcium-responsive MRI probes"

For the purpose of monitoring pathophysiological processes, magnetic resonance imaging (MRI) is considered to be the one of the leading imaging techniques. However, much work must still be done in order to enable the detection and monitoring of the fundamental biomarkers. An approach using bioresponsive MRI probes has that potential. By alternating the MR image contrast these probes could report on specific biomarkers involved in biological processes of interest.

Calcium is an ideal target for such MRI probes, because it is one of the essential metals participating in numerous biological signaling pathways. Thus, we developed different methods to achieve quantification and tracking of calcium in vivo. Using a calcium-responsive MRI probe and a remote transient ischemic model, we established a novel technique that can be used for the early detection and monitoring of cerebral ischemia. Nonetheless, to achieve the absolute quantification of calcium, information about the local concentration of the bioresponsive probe is required. Here we worked in two directions. One approach utilised a fluorescence-labelled dendrimeric probe, where MRI was combined together with post-mortem fluorescence imaging. Alternatively, we employed a calcium-responsive MRI probe incorporated in a highly fluorinated lipid nanoparticle, where it was demonstrated that a single imaging modality could suffice.