



Heidelberg University

Clinic

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Neuroradiologie
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Department of Neuroradiology

Emmy Noether Group Leader
Michael O. Breckwoldt, MD,
Ph.D.

1x PhD and 1 x Post Doc position in the field of imaging sciences, neuroimmunology and brain tumor immunology in the newly established Emmy Noether Group “Immuno-Imaging” (Head: Dr. Dr. Breckwoldt)

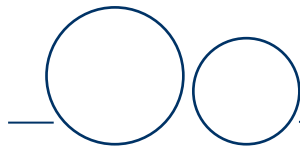
Project: Assessing the immune microenvironment in glioma models by high field MRI and optical imaging

Innate immune cells such as macrophages, microglia and dendritic cells play key roles in a variety of neuroimmunological conditions. This includes the pro-inflammatory microenvironment in autoimmune diseases like multiple sclerosis and in anti-inflammatory conditions such as in the tumor microenvironment. Manipulating the microenvironment to an anti-inflammatory state (in autoimmune conditions) to damp immune responses or to shift the microenvironment to a pro-inflammatory state (in case of tumors) can elicit therapeutically-relevant effects. However, methods to dynamically visualize the microenvironment remain insufficient. Optical methods (e.g. 2 photon microscopy) can image immune cells at cellular resolution but have limited penetration depth.

MRI is a versatile tool that can monitor innate immune cell dynamics in living animals. The group explores genetic and pharmacological means to manipulate the microenvironment. Dynamic imaging by high field MRI (**9.4 Tesla**) and optical imaging (2 photon microscopy, ultramicroscopy of cleared specimen) using **iron oxide nanoparticles** that are targeting innate immune cells and T-cells will be used for dynamic cell tracking over time. Animal models of glioma will be employed to study cancer immunotherapies and its mode of action (e.g. checkpoint inhibition, peptide vaccination, adoptive T-cell transfer). The second project explores mechanisms of glioma invasion and imaging methods to visualize diffuse tumor infiltration and its modulation during therapeutic intervention. Additional correlative methods (ultramicroscopy of cleared specimen, immunohistochemistry and flow cytometry) will be employed to dissect molecular mechanisms of therapeutic effects and resistance.

A background in biophysics (MR physics), cancer biology, neurobiology or experimental medicine would be desirable but is not a prerequisite. Experience in imaging (MRI or optical), animal handling, molecular biology or immunological techniques would be a plus. We seek a highly motivated PhD candidate and Post-doctoral fellow with an interest in translational approaches and multi-disciplinary research (neuroimmunology, biomedicine, imaging sciences). We offer a dynamic and supportive research environment within the Collaborative Research Center (CRC 1389, Unite Glioblastoma, www.unite-glioblastoma.de) with access to additional training in the graduate school of Neurooncology, international cooperations and plenty of opportunities to perform cutting edge research in one of the leading biomedical centers in Germany.

Please send your application to Dr. Michael Breckwoldt (Michael.breckwoldt@med.uni-heidelberg.de) including a CV, letter of motivation and 2 references.



Contact:

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