



RegMedNet is a network of researchers from different disciplines and institutions in the cities of Halle and Leipzig within the emerging field of regenerative medicine. Founded two-and-a-half years ago, it first targeted only clinical researchers. The need for and benefits of an expansion to include basic scientists quickly became apparent and the network grew to include members from a broad spectrum of research institutes in Leipzig and Halle.

RegMedNet supports the development of the field of regenerative medicine through its activities, including:

- Supporting and developing interdisciplinary working groups and networking events
- Distributing information (e.g., funding opportunities, research developments) to members and other interested individuals
- Identifying and pursuing funding opportunities in regenerative medicine
- Offering skill seminars for PhD candidates and Post-Docs

RegMedNet focusses among other things on the promotion of young scientists and innovative projects. The Network organizes training seminars and supports the development of an intensive communication culture and interdisciplinary co-operation between scientists of different fields.

www.regmednet.uni-leipzig.de

SELECTED ONGOING PROJECTS INCLUDE:

IMMUNOLOGY: IZI is carrying out research in induction therapies which has lead to a Phase I/II on-going clinical trial in anti-CD4 based tolerance induction.

CELL THERAPY: Researchers in IZI have established the first sheep model of stroke and are developing cell therapy solutions for stroke patients.

REGENERATIVE MEDICINE: IZI is optimizing technologies for use in tissue-engineering products and in biologically active compounds for replacement of damaged tissues.

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Fraunhofer Life Science Symposium Leipzig 2006



Main topics

- > Immunological Acceptance
- > Cell Therapy
 - Neuro
 - Cardiovascular
 - Liver
- > Spinal Regeneration
- > Imaging of Regeneration
- > Regulatory Issues for Advanced Therapy Products

October 22-24, 2006
 BIO CITY LEIPZIG, Germany

Coordinator

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FRAUNHOFER SYMPOSIUM SPEAKERS



Prof. Dr. med. Frank Emmrich
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Starting in 2003, Professor Dr. Frank Emmrich, who has a long history of successful research in the mechanisms of T-cell activation, and immunological tolerance, assumed the coordination of the German Working Group “regenerative medicine” to support its scientific basis throughout Germany. In the spring 2005, he was appointed to the Directorship of the Fraunhofer Institute for Cell Therapy and Immunology in Leipzig and at the same time was granted the honour of being selected as Secretary-General & Vice-Chairman of the Association of Clinical Research Centres of German Universities. His ongoing research interests include stem cell biology, cell therapy, cell therapy in stroke, autoimmunity and the diseases stroke, and rheumatoid arthritis.

Selected papers

- Adams, V., et al., Increase of circulating endothelial progenitor cells in patients with coronary artery disease after exercised-induced ischemia. **Arterioscler Thromb Vasc Biol** 2004, 24(4): 684–90.
- Jüngel A, et al., Expression of Interleukin-21 Receptor, but not Interleukin-21, in Synovial Fibroblasts and Synovial Macrophages of Patients with Rheumatoid Arthritis. **Arthritis & Rheumatism** 2004, 50 (5): 1468–1476.
- Laub, R., et al., Anti-Human CD4 Induces Peripheral Tolerance in a Human CD4+, murine CD4-, HLA-DR+ Advanced Transgenic Mouse Model. **The Journal of Immunology** 2002, 169 (9): 2947–2955.
- Goebel J, et al., Target of Anti-CD4 Antibody in attenuation of IL-2 Receptor. **Transplantation** 2001, 71: 792–796.



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Professor Dr. Johannes Schwarz has a long history of successful research in regenerative therapies for neuropsychiatric disorders. He has been particularly interested in Parkinson’s (PD) and has investigated the role of neural stem cells, which can be isolated and expanded in vitro while retaining the potential to differentiate into all nervous system cell types, including dopaminergic neurons. A clinical trial for cell therapy of PD has been approved and GMP conform production of stem cells will be carried out in cooperation with the Fraunhofer Institute. Dr Schwarz is Professor and vice chairman of Department of Neurology, University of Leipzig and visiting associate at the California Institute of Technology. In 2001 he co-founded NeuroProgen GmbH, an innovative start-up which develops stem cell therapies for Morbus Parkinson.

Selected papers

- Kovoor A, et al., D2 dopamine receptors co-localize RGS9 2 via the RGS9 DEP domain and RGS9 knockout mice develop dyskinesias associated with dopamine pathways. **J Neurosci** 2005; 25:2157–2165.
- Tapper A, et al., Nicotine activation of alpha4 receptors is sufficient for reward, tolerance and sensitization. **Science** 2004; 306:1029–1032
- Rahman et al. RGS9 modulates dopamine signalling in the basal ganglia. **Neuron** 2003; 38:941–52 (Rahman and Schwarz contributed equally)
- Labarca et al. Point mutant mice with hypersensitive alpha4 nicotinic receptors show dopaminergic deficits and increased anxiety. **PNAS** 2001, 98:2786–2791



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In 1998 Dr. Hans Jörg Meisel was appointed to the Clinic in Bergmannstrost Halle/Saa-le as Director of the Clinic for Neurosurgery. Every year their team of 10 surgeons carries out a minimum of 1800 surgeries in the area of cerebral and spinal diseases. The associated Bergmannstrost neurosurgery Clinical Trial Centre coordinates pre-clinical and clinical trials in the areas of: autologous disc cell transplantation with chondrocytes (phase II and III), mesenchymal stem cells, growth factor supported bone fusion in degenerative and traumatic spinal diseases, as well as clinical trials in skull/brain damaged patients and brain tumours. Dr. Meisel is a founding member of the Regenerate Network which integrates 26 European research centres, each with a masters program and industry platform, that carry out research in the area of Regenerative Medicine. In 2003, Dr. Meisel was appointed Board Member in the AOSpine (European Region) and continues to be a member of the European Technology Platform on Nano-medicine in the clinical group of the EU-Commission.

Selected papers

- Ganey T, et al., Disc Chondrocyte Transplantation in a Canine Model: A Treatment for Degenerated or Damaged Intervertebral Disc. **Spine** 2003; 28, 23, 2609–2620
- Meisel HJ, et al., Cerebral Arteriovenous Malformations and Associated Aneurysms: Analysis of 305 cases from a series of 662 Patients. **Neurosurgery** 2000; 46,4: 793–802
- Hofmeister C, et al., Demographic, Morphological, and Clinical Characteristics of 1289 Patients With Brain Arteriovenous Malformation. **Stroke** 2000; 31,6: 1307–1310
- The Arteriovenous Malformation Study Group: Duong DH, et al., Arteriovenous Malformations of the Brain in Adults. **N Engl J Med** 1999; 340, 23: 1812–1818



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Prof. Hambrecht joined the University of Leipzig Heart Centre in 1995 and works on transplantation of autologous progenitor cells in peripheral arterial occlusive diseases and in chronic coronary occlusion leading to myocardial ischemia. In addition to animal experiments primarily in rats, preliminary results from clinical trials has been collected, which demonstrates that this type of cell therapy is feasible, safe, and may improve both functional (quantitative) and clinical indices.

Selected papers

- Erbs S, Linke A, Adams V, Lenk K, Thiele H, Diederich K.W., Emmrich F, Kluge R, Kendziorra K, Sabri O, Schuler G, Hambrecht R: Transplantation of blood-derived progenitor cells after recanalization of chronic coronary artery occlusion. First randomized and placebo-controlled study. **Circulation Research** 2005; 97: 756–762
- Sandri M, Adams V, Gielen S, Lenk K, Kränkel N, Erbs S, Linke A, Scheinert D, Schuler G, Hambrecht, R: Effects of Exercise and Ischemia on Mobilization and Functional Activation of Blood-derived Progenitor Cells in Patients with Ischemic Syndromes. **Circulation** 2005,111:3391–3399.
- Hambrecht R, et al., Percutaneous coronary angioplasty compared with exercise training in patients with stable coronary artery disease. A randomized trial. **Circulation** 2004; 109(11):1371–8.
- Hambrecht R, et al., Regular physical activity improves endothelial function in patients with coronary artery disease by increasing phosphorylation of endothelial nitric oxide synthase. **Circulation**. 2003 Jul 1; 107(25):3152–8.
- Hambrecht R, et al., Effect of exercise on coronary endothelial function in patients with coronary artery disease. **N Engl J Med** 2000; 342: 454–60.



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Prof. Dr. Hengstler, is interested in the study of hepatocytes, differentiation of precursor cells, regulatory networks, as well as in-vitro systems with hepatocytes. Human hepatocytes represent a valuable tool for studies in pharmacology and toxicology as well as for hepatocyte transplantation studies. However, human hepatocytes can be difficult to work with. Presently, it is not possible to efficiently expand human hepatocytes in vitro, for instance by addition of growth factors to the culture medium. Prof. Hengstler has therefore initiated projects in his lab to differentiate human somatic stem cells into hepatocyte-like cells. In vitro systems with hepatocytes from human, rat, mouse, dog, and monkey have been established in his lab. These systems include two-dimensional co-cultures and are used in in-vitro systems to identify metabolites as well as interspecies differences in drug metabolism, differences in toxicity, and enzyme induction studies. Another field of interest is in the regulatory networks controlling proliferation.

Selected papers

- Ruhnke M, et al, Differentiation of in vitro-modified human peripheral blood monocytes into hepatocyte-like and pancreatic islet-like cells. **Gastroenterology**. 2005 Jun; 128(7):1774–86.
- Ruhnke M, et al., Human monocyte-derived neohepatocytes: a promising alternative to primary human hepatocytes for autologous cell therapy. **Transplantation**. 2005 May 15;79(9):1097–103.
- Herrmann F, et al., HER 2/neu-Mediated Regulation of Components of the MHC Class I Antigen-Processing Pathway. **Cancer Res**. 2004; 64:215–20.
- von Mach MA, In vitro cultured islet-derived progenitor cells of human origin express human albumin in severe combined immunodeficiency mouse liver in vivo. **Stem Cells**. 2004; 22(7):1134–41.



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Since April 2003 Professor Dr. Sabri is the Spokesman of the Working Group for Neuro-nuclear Medicine of the German Association of Nuclear Medicine which he co-founded in 1999 while he was assistant medical director at the University of Aachen. He is the winner of the KFAS-Prize („Arabian Nobel Prize“) 2005 in the field of “Applied Sciences: Nuclear Medicine”, for his scientific achievements in evaluating “The role of nuclear medicine (PET, SPECT) in functional neuroimaging of dementia and schizophrenia” over the last 15 years. As Director and Chairman of the Department of Nuclear Medicine of the University of Leipzig he continues to explore applications of nuclear medicine for brain research in neurology and psychiatry, with emphasis on vascular dementia, schizophrenia and multimodal imaging for functional-morphological assessment of brain diseases. Prof. Sabri is particularly interested in development and clinical use of new cerebral PET radioligands for cholinergic, serotonergic and dopaminergic neuroreceptors/neurotransmitters to study dementia and disorders with cognitive impairments, neurodegeneration, and psychoses at the molecular level.

Selected papers

- Deuther-Conrad W, et al. Autoradiography of 2-[18F]F-A-85380 on Nicotinic Acetylcholine Receptors in the Porcine Brain In Vitro. **Synapse** 2006; 59: 201–210.
- Hambrecht R, et al., Percutaneous coronary angioplasty compared with exercise training in patients with stable coronary artery disease. A randomized trial. **Circulation** 2004; 109:1371–1378.
- Sabri O, et al. A truly simultaneous combination of functional transcranial Doppler sonography (fTCD) and 15O-water PET adds fundamental new information on differences in cognitive activation between schizophrenics and healthy control subjects. **J Nucl Med** 2003; 44: 671–681.
- Sabri O, et al. Correlation of positive symptoms exclusively to hyperperfusion or hypoperfusion of cerebral cortex in never-treated schizophrenics. **Lancet** 1997; 349: 1735–1739.