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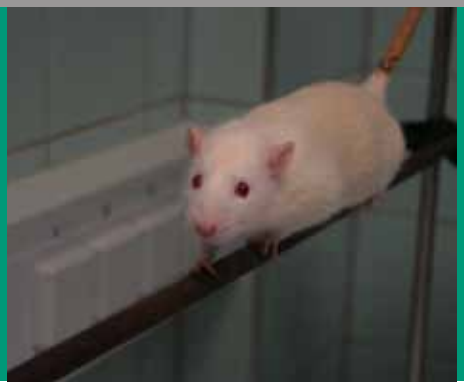

RAT MODEL OF FOCAL CEREBRAL ISCHEMIA (STROKE)

The effect of therapeutic interventions can be studied in detail using the rat model after transient or permanent disruption of cerebral blood flow in the middle cerebral artery.

The rat model allows easy, reliable and fast realization of small and large scale animal studies to reveal dose-response interactions, or to compare different routes of administration as necessarily needed to the STAIR quality assurance criteria in preclinical stroke research. Sophisticated imaging procedures such as magnetic resonance imaging (MRI) and methods of behavioral phenotyping are parts of our standard therapeutic monitoring protocols. Detailed histological investigations complete the methodological spectrum to describe, quantify and analyze the therapeutic impact of a certain treatment.

Unique Feature

The rat model allows cost-effective, time-saving and detailed evaluation of numerous treatment strategies by numerous methods in vivo. Next to fulfilling the crucial STAIR criteria and requirements of regulatory authorities, we can generate an optimal treatment protocol to be defined and later tested in the translational large animal stroke model (IZI320-03) mimicking clinical reality.

Methods

Spontaneously hypertensive rats, showing the risk profile of many human stroke patients are subjected to transient and permanent middle cerebral artery occlusion.

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Investigation Methods

- CT: anatomic imaging, diagnosis of tumor formation and bleedings
- MRI: detailed anatomic and functional imaging
- Immunohistochemistry: detailed histological investigation, optionally including the use of confocal laser scanning or electron microscopy
- Behavioral phenotyping: quantification of sensorimotor deficits and cognitive functions

Selected Applications

- Development of novel treatment strategies for stroke
- Evaluation of neuroprotective agents and cell therapies
- Allogenic, xenogenic and also limited autologous cell therapy testing
- Dose-response studies, comparative evaluation of administrative procedures and routes
- Long term investigation of safety and efficacy
- Studies in old and / or premorbid subjects
- Detailed histological characterization of therapeutic success
- Detailed sensorimotor functional evaluation and testing
- Evaluation of novel diagnostic tools
- Investigation of innovative combined therapies

Reference Project

The Neurorepair Research Group investigates the therapeutic potential of regenerative cells from adult adipose tissue following ischemic stroke together with an industrial partner from California. All transplantation studies are performed strictly in accordance to the STAIR criteria for quality assurance in preclinical stroke research. The study involves models of transient and permanent middle cerebral artery occlusion, dose-definition approaches, and detailed histological procedures and imaging. We collaborate together with local academic partners to ensure success of the study. In instances of successful therapeutic evaluation, the protocol will be subsequently tested in the large animal stroke model, to generate convincing preclinical data as a basis for clinical trial.