other names with a probability of 20%; (ii) the SON at 50% and four other names at 12.5%; (iii) a noncommonly used name (NUN) at 20% and four other names at 20%; and (iv) a NUN at 50% and four other names at 12.5%. ERPs were recorded simultaneously. Data were analyzed with SPM99. Analysis of ERP data showed a 'P300-like' component in response to the SON with higher amplitude when its probability of occurrence was small. The difference in P300 amplitude between the SON (or the NUN) and the other names of a same sequence was used as covariate of interest in the SPM analysis. In mesiofrontal cortex (Brodmann area 10) and the right superior temporal sulcus (BA 21), we observed a linear correlation between regional cerebral blood flow and the P300 amplitude when subjects heard their own first name. These results are in line with previous studies on self-processing and underline the role of medial prefrontal cortex during self-referential judgments and of superior temporal sulcus during mapping between the self and the other.

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Recognition of novel objects in contrast to new spatial arrangement of objects differentially activates the MTL subareas in humans

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Objective A number of animal studies have reported a distinction between the contributions of the hippocampus and perirhinal cortex to memory, such that the hippocampus is crucial for spatial memory, while the perirhinal cortex plays a pivotal role in visual recognition memory. The literature on human neuropsychology, however, is sparse on this issue. To determine if such a distinction is also present in humans we conducted a functional magnetic resonance imaging (fMRI) study, comparing the medial temporal lobe responses to changes in object identity or spatial arrangement of objects.
Methods Twelve young subjects were examined with fMRI sensitive to blood oxygen level-dependent contrast. The visuospatial activation task consisted of patterns containing five concrete objects. In the spatial change conditions, the five familiar objects were in new spatial arrangements, and in the novel object conditions one of the objects was replaced with a novel object.
Results The anterior hippocampus and perirhinal cortex participated in object novelty recognition, whereas the posterior hippocampus was involved in detection of new arrangement of objects. The magnitude of parahippocampal responses was rather similar in both conditions but the parahippocampal responses to spatially altered stimuli were more posteriorly located.
Conclusion A functional double dissociation also exists in the human between perirhinal cortical encoding of object novelty and hippocampal encoding of new spatial arrangements. Furthermore, a robust specialization within the hippocampus along its long axis was observed, a finding that may explain some previous controversies in primate studies about the role of hippocampus in object recognition.

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The neuroanatomy of visual neglect

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The brain regions that are critically associated with the visual neglect syndrome have recently become intensely disputed. One study of middle cerebral artery (MCA) stroke patients has claimed that the key brain region associated with neglect is the mid-superior temporal gyrus (STG), rather than the parietal lobe. Such a result has wide-ranging implications both for our understanding of the normal function of these cortical areas, as well as the potential mechanisms underlying neglect. We used novel high resolution MRI protocols to map the lesions of 35 right-hemisphere patients who had suffered either MCA or posterior cerebral artery (PCA) territory stroke. For MCA territory stroke patients, the critical area involved in all individuals with neglect was the angular gyrus of the parietal lobe. Although the STG was damaged in half of our MCA neglect patients it was spared in the rest. For PCA territory strokes, all patients with neglect had lesions involving the parahippocampal region, on the medial surface of the temporal lobe. PCA patients without neglect did not have damage to this area. We conclude that damage to two posterior regions, one on the lateral surface of the parietal lobe and the other in the medial temporal lobe, is associated with neglect. Although some neglect patients do have damage to the STG, our findings challenge the recent influential proposal that lesions of this area are critically associated with neglect. Instead, our results implicate the angular gyrus and parahippocampal region in this role.

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fMRI of the human sensorimotor cortex before and after subsensory whole-hand afferent electrical stimulation

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Introduction Stimulation of proprioceptive pathways using whole-hand electrical stimulation with a mesh glove has been shown to improve motor performances of stroke patients with chronic neurological deficits. The aim of the study was to elucidate whether changes in the motorcortex activation pattern can be demonstrated after electrical stimulation of the hand in volunteers.

Materials and methods All experiments were performed on a 1.5 Tesla MR-scanner in 10 healthy subjects. The motor-paradigm was self-paced finger-to-thumb tapping of the left hand. Firstly, a baseline fMRI examination and secondly subthreshold electrical stimulation with 0.9 mA was applied for 20 min outside the magnet to the left hand using a mesh glove. Thirdly, an identical fMRI run to the baseline and the second run 12 h post stimulation was performed. Post-processing was perfomed with ^{99}SPM.
Results Group analysis of fMRI-data showed: (i) Baseline fMRI examinations revealed brain activation of the primary and secondary sensorimotor cortex as previously described. (ii) After electrical stimulation of the left hand, there was an increase of activated pixels in these areas. (iii) In addition, there was activation of regions not visible on the baseline studies. These involved the ipsilateral inferior parietal lobule, the pre- and postcentral gyrus and the superior parietal lobule. (iv) These changes disappeared 12 hours post-stimulation.
Conclusion fMRI reflects an increased bold response due to an increase of local-field potentials within the sensorimotor cortex due to electrical stimulation. Thus, local-field potentials can be successfully influenced by subsensory stimulation of afferent pathways. This holds promise for the application of fMRI in the planning of neurorehabilitation strategies.

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Visual rating and ROI-based parametric analysis of rCBF SPECT in patients with mild or questionnable dementia and healthy volunteers: A comparative study

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Objective The aim of this study was to assess the accuracy of visual image rating compared with parametric analysis of rCBF SPECT images from a population of memory clinic patients and healthy controls.
Methods SPECT with ^{99}mTc-HMPAO was used to determine rCBF in 45 patients and 26 healthy volunteers. The 45 patients (28 F/17 M) had mild or questionable dementia (mean age 74.6 years, range 62–88; mean MMSE score 24.8, range 20–30). The 26 healthy controls (12 F/14 M) had a mean age of 65.9 years (range 51–79) and a mean MMSE score of 29.1 (range 26–30). Visual rating was performed by two experienced investigators in consensus, who were blinded to the study subjects' identity, and the global and regional rCBF patterns were evaluated (normal or abnormal). After normalisation of CBF to mean blood flow in the cerebellum, parametric image analyzes gave values for rCBF in several cortical regions of interest, and side-to-side asymmetry indexes and anterior-posterior ratios were calculated.
Results The sensitivity and specificity of the visual rating were 80% and 50%, respectively, yielding an overall accuracy of 69% for visual rating. Simple statistical criteria applied to the rCBF data from parametric image analysis correctly classified all the patients' SPECT images as abnormal.
Conclusion The visual rating of ^{99}mTc-HMPAO SPECT images is inaccurate in separating images from patients with mild memory disorders from healthy volunteers. Parametric image analysis followed by statistical comparison of rCBF data with data from a relevant control group is suggested.

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The neural circuitry of persistent latent inhibition as a model of negative symptoms in schizophrenia

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Latent inhibition (LI) is the proactive interference of inconsequential pre-exposure to a stimulus with its ability to signal significant events. Disrupted LI, reflecting attentional overswitching, is considered to model positive symptoms of schizophrenia. Nucleus accumbens core (NACc), prefrontal cortex and basolateral amygdala (BLA) are presumed to be involved in the pathophysiology of schizophrenia, but lesions in these regions spare LI. We suggest that since these regions are involved in perseverative behavior, such lesions may produce abnormally persistent LI, reflecting attentional perseveration, which may model negative symptoms of schizophrenia. We here tested whether NACc, BLA and orbitofrontal cortex (OFC) lesions would induce LI perseveration, which would be reversed by clozapine but not by haloperidol, as expected of an animal model of negative symptoms. LI was measured in a conditioned emotional response procedure by comparing response to a tone in rats which received 0 or 40 tone presentations followed by 2 or 5 tone-shock pairings. Control rats showed LI with 40 pre-exposures and two conditioning trials, but raising the number of conditioning trials to five disrupted LI. In contrast, lesioned rats persisted in exhibiting LI under the latter condition, and this was reversed by clozapine but not by haloperidol. Our finding that LI perseveration following NACc, BLA and OFC lesions was normalized by clozapine but not by haloperidol supports the relevance of lesion-induced LI perseveration to negative symptoms. Since these structures are reciprocally connected and reported to be involved in the pathophysiology of schizophrenia, the results may be relevant to the neural circuitry underlying negative symptoms.

Motor neurone diseases

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DTI and ALS

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Amyotrophic lateral sclerosis (ALS) is a progressive fatal neurodegenerative disorder characterized by the degeneration of the corticospinal tracts (CSTs) and anterior horn cells. CST degeneration may be difficult to detect in life and a quantifiable robust surrogate marker of upper motor neurone (UMN) degeneration would be of tremendous utility in the monitoring of future treatment trials. We have applied the technique of Diffusion Tensor Imaging (DTI) to investigate the CSTs of subjects with ALS. Comparing a group of 12 ALS patients with 12 healthy controls, we found statistically significant reductions in fractional anisotropy (FA) and increases in mean diffusivity (MD) in regions of interest (ROIs) within the CSTs of the ALS group, indicating that DTI can detect UMN degeneration in ALS. DTI is a promising tool for detecting UMN pathology in ALS. There remains an overlap in diffusion indices between individual ALS patients and controls which may in part be due to limitations of an ROI analysis. We are refining our method of identification of the CSTs by

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