Quantitative Assessment Of Changes In Tissue Status In Disease, Development, Aging, Or Degeneration Using Diffusion Tensor Magnetic Resonance Imaging

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Technology description

Summary

This invention significantly enhances the quality and utility of diffusion tensor magnetic resonance imaging (DT-MRI) data. The patent application for the invention describes quantitative statistical methodology to extract novel clinical and biological information from DT-MRI data. These parametric and non-parametric statistical methods help distinguish changes in tissue state from background noise inherent in all MRI measurements. The invention also includes hypothesis tests to determine the statistical significance of changes observed in MRI "stains" (e.g., the Trace of the diffusion tensor, Trace(D), and the mean apparent diffusion coefficient, ADC), which are widely used in the diagnosis of stroke. Further, this invention describes how to detect systematic artifacts in each pixel of a diffusion weighted image (e.g., artifacts caused by patient motion). Indeed, this new statistical methodology for analyzing and interpreting diffusion tensor MRI data should improve the efficacy of drug screening studies, as well as streamline multi-site and longitudinal studies designed to assess the safety and efficacy of drugs undergoing clinical evaluation.

Institution

NIH - National Institutes of Health

联系我们

叶先生

电 话：021-65679356

手 机：13414935137

邮 箱：yeyingsheng@zf-ym.com