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Poster 8

Application of NMR Microscopy to Biological Systems

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We previously reported that a phantom image of micron-resolution had been obtained by development of probe, rf coil and a pulse sequence which could reduce diffusion effect and by using a high magnetic field of 14.1T. The method has been applied to biological systems such as mouse follicles and plant stem. As a result of these experiments, we were able to obtain images of distinct morphological structure of the follicle and cellular image of plant stem.

With a 9.1T (400MHz) NMR system, we obtained images of mouse using spin-echo pulse sequence. The multi-slice T2-weighted brain images showed internal structure of the brain. With the mouse of electrical damage to the brain, distinctive features of the brain damage were observable. In addition, the 3-dimensional T1-weighted mouse images showed internal organs and embryos. Such images will permit the rapid nondestructive analysis of complex anatomical structures needed for the studies of brain disease and genetic research.