Magnetic resonance imaging : methods and biologic applications

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Abstrak

Even as magnetic resonance imaging (MRI) has matured into an invaluable diagnostic tool, it has also become a key experimental tool in biological research, where it demonstrates special sensitivity to a plethora of physiological factors, as well as a capacity for use all the way from cellular suspensions to in vivo human studies. In Magnetic Resonance Imaging: Methods and Biologic Applications, leading experts in the use of MRI from both academia and industry explain its basic principles and demonstrate its power to understand biological processes with numerous cutting-edge applications. To illustrate its capability to reveal exquisite anatomical detail, the authors discuss MRI applications to developmental biology, mouse phenotyping, and fiber architecture. MRI can also provide information about organ and tissue function based on endogenous contrast mechanisms. Examples of brain, kidney, and cardiac function are included, as well as applications to neuro- and tumor pathophysiology. In addition, the volume demonstrates the use of exogenous contrast material in functional assessment of the lung, noninvasive evaluation of tissue pH, the imaging of metabolic activity or gene expression that occur on a molecular level, and cellular labeling using superparamagnetic iron oxide contrast agents. Cutting-edge and user-friendly, Magnetic Resonance Imaging: Methods and Biologic Applications illuminates for biological scientists the basic principles of MRI and shows how it can be used successfully to solve important biological problems.