Iron complexes as PARACEST magnetic resonance imaging agents and for temperature dependent chemical shift imaging (see 6841, 6580)

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Technology description

Elevated iron levels have been identified in a variety of neurologic disorders, includingParkinson’s, Huntington’s, Alzheimer’s, Friedreich’s ataxia and multiple sclerosis.It has been hypothesized that excess iron may play a role in the progressive deterioration observed in patients suffering from those diseases.Current MRI techniques (e.g.magnetic susceptibility imaging, and T_2 and T_1 weighted MR images)used to detect excess iron deposits rely ondifferences of bulk water proton relaxivity.Unfortunately, these techniques suffer from the presence of artifacts, thereby complicating clinical interpretation.More direct imaging methods are needed that would specifically image iron and only iron in tissue.A UB chemist has developed a series of ligands thatrepresent an entirely new class of contrast agents that respond only upon sequestering endogenous iron in cells, making it possible to image Fe(II) and only Fe(II) within a sea of metal ions and other cellular components. These PARACEST-based contrast agents appear to be usefultools for monitoring excess iron levels in tissue and may facilitate the tracking and treatment (e.g. chelating agents, CNS drugs, etc.) of diseases involving aberrant iron levels. Additionally, their development as clinical tools would provide a much-needed alternative to lanthanide contrast agents (e.g. gadolinium), which can be problematic for patients with compromised renal function.

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