Tracking molecules in the brain using magnetic resonance imaging (MRI)

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Abstract:

Biomedical imaging plays an important role in modern healthcare. It helps to locate the disease-related molecules in our body and to guide therapy. I propose a learning and discovery module to enhance students' knowledge in this area and to allow them to explore the frontier imaging technologies. The first component of this module will show students the basic elements of biomedical imaging in the form of case studies. MRI images with particular diseases will be presented, and students will need to figure out how the images are acquired and what are the abnormalities show in the images. The goal is to provide an overview of applications of imaging in healthcare, especially in tracking disease-related molecules. The second component will be the modification of imaging protocols to highlight pathologies in the form of group projects. After the case study, students will be able to indicate drawbacks of certain imaging protocols, and hence to think of ways to improve the imaging outcomes. This will enable them to apply their knowledge, think critically and creatively to solve problems in biomedical imaging.