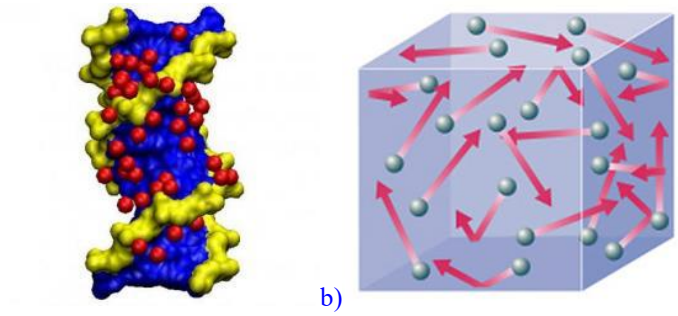
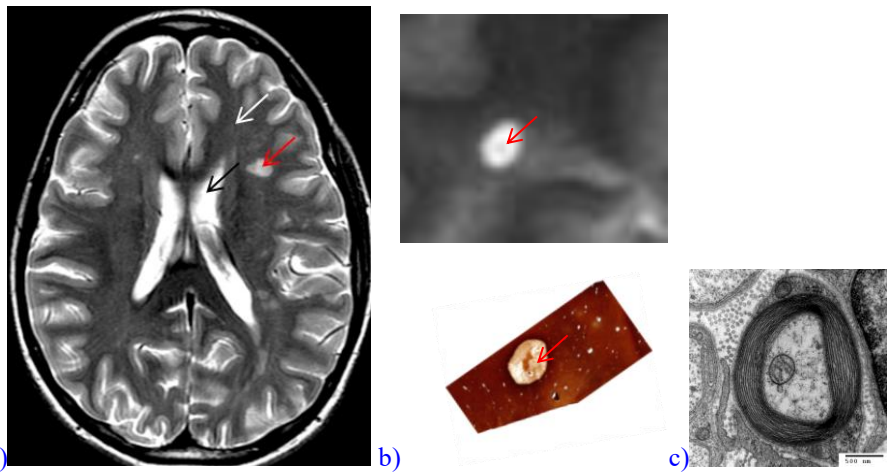
CHAPTER 3



a) b)

a) Water (red) interacting with macromolecule DNA (yellow+blue), resulting in a large correlation time and 1/T2, or a short T2. (The Protein Data Bank)
b) Water not interacting with cellular contents, resulting in a small correlation time and relaxation rate, or a long T2.



a) b) c)

a) The T2 weighted image (T2w) depicts hyperintense cerebrospinal fluid (little cellular content with a small 1/T2 relaxation rate, black arrow), hypointense white matter (full of myelin sheath or high cellularity with a large 1/T2, white arrow), and an intermediately hyperintense multiple sclerosis (MS) lesion (demyelinated, intermediate 1/T2, red arrow). This image demonstrates how T2w reflects cellularity.
b) T2w image (top) of an autopsied brain section and corresponding histology stained for myelin basic protein (bottom, brown color indicates myelin) depict a completely demylinated MS lesion (red arrow).
c) Electron micrograph of a myelinated axon shows dense lipid bilayers in the myelin sheath, generating long correlation time and large 1/T2. (https://en.wikipedia.org/wiki/File:Myelinated_neuron.jpg).