

## **Absract**

Nanoparticles are proving to be immensely helpful in the field of medicinal research. Being smaller in size and having a higher reactivity, they are being used in various biological systems and these studies can be further used in targeted drug deliveries. Triblock copolymers are very powerful tools for biological studies as they form meshes which are quite similar in structure to the membranes present inside our body. And so diffusion and interaction of nanoparticles with these triblock copolymers can further aid to the medicinal purposes. Here we have studied the relaxation, diffusion and interaction studies of the system containing triblock copolymer mesh and silver nanoparticles. Various chemical compounds when added to a system can change the diffusion and interactions occurring in the system. If we want to make a system more biologically favorable, we can add chemical compounds that can make it more similar to the fluids present in the body. Then studies conducted in these type of systems will yield results which are of better use. We added Dextran and Ficoll to our existent system and then did the relaxation, diffusion and interaction studies of the system. To make the system more blood like, we added a blood substitute perflurodecalin and then did the relaxation, diffusion and interaction studies of the system. Chapter 1 deals with a short introduction to NMR and its basic concepts of relaxation. Chapter 2 deals with the theory regarding diffusion and the concept of pulsed field gradient. It also contains a brief overview of the methods used in the calculations of relaxation times T1 and T2. Chapter 3 deals with a description of silver nanoparticles and the biomolecules used in the studies of this project. Chapter 4 deals with the experiments performed on various systems. It also contains the results of these experiments and an analysis of these results. Chapter 5 deals with the conclusions drawn from these experiments.

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