Abstract

Nanoparticles are the new technological revolution in the field of medicine. Different kind of nanoparticles are being used for different purposes. Targeted drug delivery is the main aim to fulfill through the use of these nanoparticles. The physical properties of these nanoparticles vary with reference to the feature of the target. Mag- netic Nanoparticles(F e2 O3), Gold Nanoparticles(AuNP), Silica Nanoparticles(SiO2), Silver Nanoparticles(AgNP) are some examples which have been regularly used in medicinal purposes. Now since the delivery of drug to the target is through a path which contains different parts of cell so studying the interaction with those parts is also part of the problem as that affect the effciency of targeted delivery. Lipid bi- layer membrane is a part of a cell through which our nanoparticle makes it's way to the target. There are various studies[1–3] of the interaction between lipid membrane and nanoparticle. Here we have studied the phase behavior of the lipid membrane with and without nanoparticle at a temperature range from 10◦ C to 40◦ C through 31 P Nuclear Magnetic Resonance(NMR). We have compared T1 Relaxation time, T2 Relaxation time, Diffusion Coefficient, Hydrodynamic Radius of the same. A signifi- cant difference have been found in these values at various temperature and also phase transition temperature has shown some shift in the values. Interaction studies of Nanoparticle and Polymer Mesh is also important as polymer meshes work as a vesicle for these nanoparticle to reach the target. Various studies suggested that Triblock Copolymer have a property to form better mesh than other normal polymer which is why it has been used in this area for a long time as a vesicle for nanoparticle. We studied the effect of nanoparticle on the correlation in between the bond of Triblock Copolymer through 1D Proton NMR & 2D COSY NMR. A significant shift has been found at some peaks which shows strong interaction of nanoparticle and Triblock Copolymer.