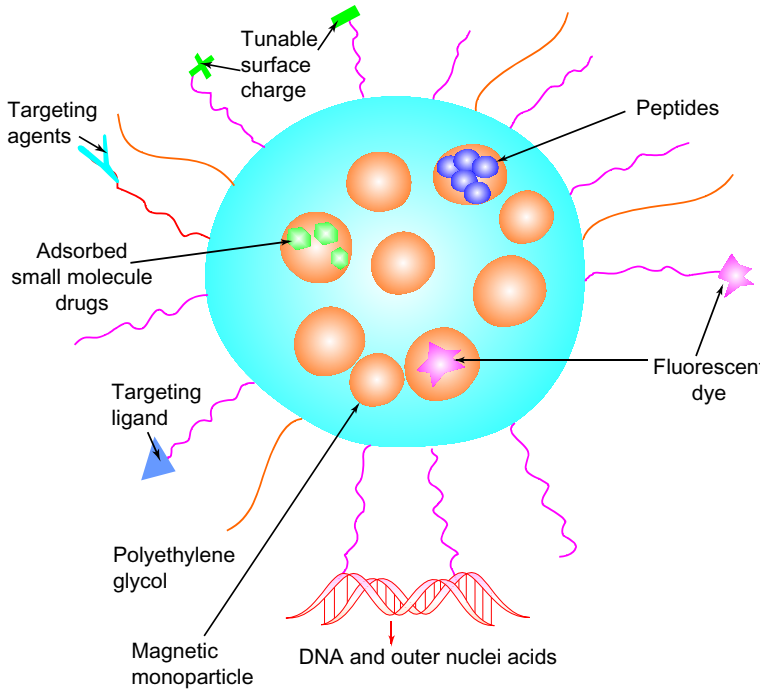

FIG. 19.6 Drug loading in MSN.

MSN is covalent linking of the drug with functional groups present on the pore wall and this alternative is very effective in controlling premature drug release.

19.5.1 Factors Affecting Drug Loading

19.5.1.1 MSNs Hydrolytic Stability

An important criterion for drug-loading application of MSNs is its hydrolytic stability. Quite a few groups have reported about dissolution behavior of MSNs in biological media. If particles are stored as an aqueous dispersion, their hydrolytic stability becomes more significant as it determines their shell life and also drug-particle formulation is dependent on it. For efficient delivery at the targeting site, the targeting group and drug should remain attached with MSNs (Fig. 19.7), until it reaches the target. More systematic studies are required to know the kinetics of intracellular dissolution, which are slower compared to extracellular dissolution because of limited volume inside the cells.

An interesting study regarding dissolution of micronsized mesoporous silica in water as a function of pH, both in its native form as well as amino functionalized form was carried out by Etienne and Walcarius (2003), which showed that under biologically relevant pH conditions amino functionalized