Sharma, A.; König, B.; Jayaraman, N**.,** 2014, "Photocatalytic disassembly of tertiary amine-based dendrimers to monomers and their application to the 'catch and release' of a dye in aqueous solution, *New. J. Chem*., *38,* 3358 – 3361.

The manuscript summarizes an important effort in the area of dendrimer chemistry pertaining to the covalent bond dis-assembly of a dendrimer to the constituent monomer. The task has so far been limited only to dendrimers possessing aromatic moieties, ester moieties and in one case, amide moiety. Currently, there is no approach known to dis-assemble the covalent bonds of fully aliphatic dendrimers in a benign route. This manuscript describes a successful effort to dis-assemble covalent bond present in a fully aliphatic dendrimer, constituted with tertiary amine branch sites, under benign a photochemical condition. Photochemical dis-assembly is performed efficiently in the presence of photocatalysts, such as, 9,10-anthraquinone or riboflavin tetraacetate and oxygen (g) and the product formation was elucidated fully with the aid of physical methods.

Upon photochemical cleavage of the dendrimer to constituent monomers, an effort was undertaken to utilize the dis-assembly as a method to 'catch' and 'release' a dye, as a result of dendrimer host-guest interaction, followed by its release upon dendrimer dis-assembly. The proof of concept was illustrated using water-insoluble dye sudan I. The solubility of the dye in aq. solution containing the dendrimer was enhanced by more than two-orders of magnitude. Host-guest complexation initially, followed by the release of the guest as a result of dendrimer host photochemical dis-assembly was conducted, in order to retrieve the solubilized dye. Such an approach is extremely attractive, in the light of previous studies that the dendrimers under discussion are non-toxic and host-guest interactions are very useful in areas such as drug delivery. The work demonstrates an expansion of dendrimer research, where the covalent bond dis-assembly is an important development to the area at large.