Kiran, B. M.; Jayaraman, N., 2009, "Synthesis of multivalent dendritic thiols and formation of dendritic cross-links through thiol-disulfide interchange reaction", *Macromolecules*, *42*, 7353 – 7359.

This manuscript is concerned with the synthesis of multivalent dendritic ligands of up to three generations, followed by a study of the thiol-disulfide interchange process, which leads to the formation of dynamic, covalent and reversible dendritic megamers. Dendrimers with 3, 6, 12 and 24 thiol functionalities present at their peripheries were synthesized systematically, with a focus to utilize these multivalent dendritic thiols in the formation of reversible covalent cross-links of dendritic megamers. The disulfide bond formation among the constituent dendritic thiols leads to the dendritic megamers. The cross-link moieties being the disulfides, a facile dis-assembly of the megamer to the corresponding monomer could be accomplished, under the disulfide bond reducing conditions. Thus the study reports the reversible dendritic megamer formation and their dis-assembly to the monomer, for the first time in the dendrimer literature. We also perceive that this approach opens up the possibilities to introduce the concept of 'mendable' or 'self-healing polymers', which is up-coming in the area of the polymer chemistry to the dendrimer chemistry. Although cross-linked dendrimers are known in the literature, our study delineates not only the cross-linked dendritic megamer formation, but also, reversible opening to the constituent dendritic monomer formation, achieved with the aid of the facile thiol-disulfide interchange reaction. Host of future studies are envisaged from this new concept of "reversible dendritic megamers".