The formation of a library of diverse macrocyclic compounds with different functionalities and ring sizes in a few steps from two easily accessible α,ω-diol building blocks is presented. The building blocks are combined by esterifications in four different ways leading to the formation of four structurally isomeric diol precursors. These are then reacted with electrophilic reagents leading to 17-membered sulfites and 19-membered malonates in reasonable yields, and 20-22-membered phthalates and an 18-membered oxalate in low yields. Double-reductive amination of dialdehyde analogs of the diol precursors leads to 15-membered amines in yields ranging from 9 to 60%, reflecting large differences in reactivity based on steric environment. The conversion of the two least sterically hindered diols into diiodide analogs is also presented. However, the desired cyclizations of these precursors have not been successful.

Part II

The formation and subsequent coupling of a monosilver(I) acetylide of 2,3-diethynyltriptycene is presented. The silver(I) acetylide is formed in high yield from both 2,3-diethynyltriptycene and 2,3-di(trimethylsilyl)ethynyltriptycene by use of the same reagent. Coupling of the silver(I) acetylide with 1-iodoadamantane is demonstrated. Furthermore, attempts at the synthesis of 1,3-difluoro-5,7-diiodoadamantane from 1,3,5,7-tetraiodoadamantane are presented. Unfortunately, the reaction is found to be uncontrollable by use of two different reagents, giving a mixture of fluorooiodoadamantanes. However, overall the results provide a good starting point for the synthesis of new triptycene and adamantane-containing molecules that can interact with carbon nanotubes.