

Synthesis of a fluorescent and star-shaped 4-arm PEG with different functional groups at its ends

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Dityrosine (DY), which is fluorescent and biocompatible, has multiple functional groups, including two amine and two carboxylic acid groups. By conjugating PEG arms to DY, we successfully synthesized a star-shaped 4-arm PEG with two carboxylic acid and two amine groups at its four ends. The amine groups were protected with t-butoxycarbonyl (Boc) groups to allow sequential use of these functional groups (i.e., by first using the carboxylic acid groups, followed by deblocking of the Boc groups, and finally using the amine groups). Moreover, two different kinds of molecules could be further linked to this 4-arm PEG. The chemical structures and molecular weights of the intermediate 2-arm PEG and 4-arm PEG were determined by ¹H-NMR spectroscopy and matrix assisted laser desorption ionization - time of flight - mass spectrometry (MALDI-TOF-MS).