

**Synthesis and Characterization of the novel N^ε-9-
Fluorenylmethoxycarbonyl-L-Lysine N-Carboxy Anhydride.
Synthesis of Branched Polypeptide**

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In this poster the synthesis and characterization of the novel monomer N^ε-9-Fluorenylmethoxycarbonyl-L-Lysine N-carboxy anhydride (N^ε-Fmoc-L-Lysine NCA), as well as the Poly(L-Lysine)₇₈-*block*-[Poly(L-Lysine)₁₀-*graft*-Poly(L-Histidine)₁₅] block-graft copolypeptide, are presented. The synthesis of the graft copolypeptide was conducted via ring-opening polymerization (ROP) of the N^ε-Boc-L-Lysine NCA while using *n*-hexylamine as the initiator, followed by the polymerization of N^ε-Fmoc-L-Lysine NCA. The last block was selectively deprotected under basic conditions, and the resulting ε-amines were used as the initiating species for the ROP of N^{im}-Trityl-L-Histidine NCA. Finally, the *Boc*- and *Trt*- groups were deprotected by TFA. In order to achieve the synthesis of well-defined polymers, ensure the purity of the solvents and therefore the purity of the whole system so to avoid non controlled polymerization and termination reactions, high vacuum techniques were applied. The characterization of the polymer in order to confirm the successful synthesis as well as to define its molecular characteristics was carried out by Size Exclusion Chromatography, Proton Nuclear Magnetic Resonance and Infrared Spectroscopy. Finally, Dynamic Light Scattering, ζ-potential, and Circular Dichroism measurements were used in order to investigate the ability of the polypeptide to self-assemble in different conditions. This monomer opens avenues for the synthesis of polypeptides with complex macromolecular architectures that can define the aggregation behavior, and, therefore, can lead to the synthesis of “smart” stimuli-responsive nanocarriers for controlled drug delivery applications.

References:

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