Amphiphilic Block Copolymers With Terminal Moieties For Effective Targeting And Drug Release Against Tumor Cells

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Cancer treatment remains a major challenge in medicine, with traditional cancer treatments including surgery complemented by radiotherapy and/or chemotherapy. In response, pharmaceutical scientists and clinicians are trying to apply nanotechnology to medicine, in order to deliver drugs, genes and proteins with enhanced therapeutic efficacy, reduced dose and low dosing frequency, resulting in fewer side effects. For this purpose, we have synthesized amphiphilic block copolymers with terminal moiety that its receptors are overexpressed in tumor cells. Such copolymers are composed by a hydrophilic block such as poly(ethylene glycol) (PEG) and a hydrophobic block such as poly(L-histidine) (PHis). The terminal moiety can be either folic acid or glycerrhetinic acid which both receptors are overexpressed in tumor cells. [1,2] Size exclusion chromatography (SEC), proton nuclear magnetic resonance (1H-NMR) and infrared spectroscopy (FT-IR) were employed for the characterization of the synthesized polypeptides. Circular dichroism (CD) was carried out to study the correlation between the secondary structure, pH and temperature.

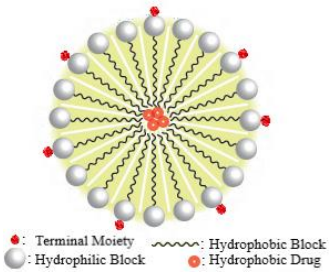

Figure 1: Amphiphilic nanoparticle loaded with hydrophobic drug with terminal moieties attached to the hydrophilic block.

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