Synthetic Studies on Photoimmunotherapeutic Agents (VI): Synthesis of Bifunctional Silicon Phthalocyanines and Evaluation of Binding Activity for streptavidin

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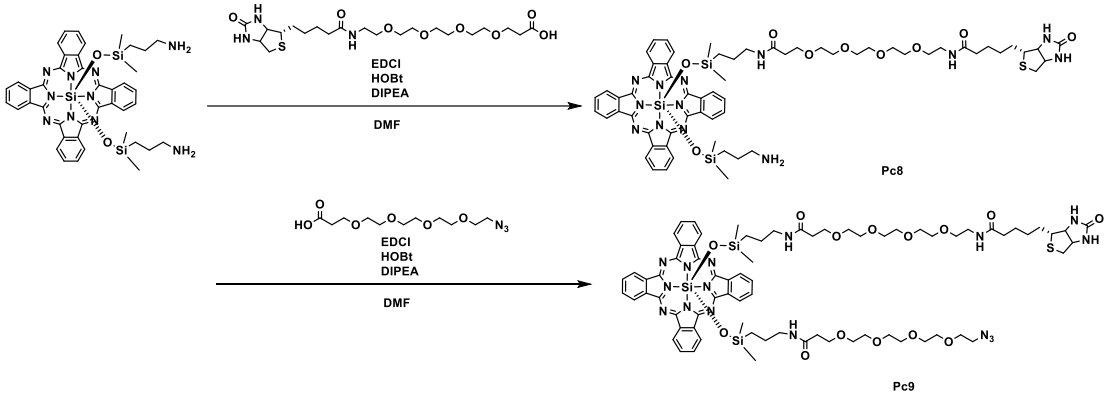
Photoimmunotherapy is a cancer treatment for head and neck cancers. In this treatment, a drug called IR700, which has a silicon phthalocyanine (SiPc), is combined with IgG antibodies and administered to cancer patients. The drug then binds to EGFR on the surface of cancer cells, and irradiation of 690 nm light causes a photochemical reaction[1)]. This reaction reduces the hydrophilicity of the drug and promotes partial cell breakdown and disappearance due to degeneration of antibody or aggregation of the drug[2)]. The advantage of this treatment is that it suppresses side reactions because of causing a photochemical reaction at the side of cancer cells, and research is being conducted as a new cancer treatment. However, the difficulty of preparation of the drug and its low water solubility are problems. In this study, use of selective reactions and synthesis of protein-containing silicon phthalocyanine (SiPc) derivatives were performed in order to solve above problems.

Compound **Pc8** was synthesized by amide condensation reaction of **Pc2** with Biotin linker containing PEG spacer[3)]. Subsequent condensation with an azide linker containing PEG spacer[3)] with **Pc8** gave **Pc9**. In addition, the azide linker was condensed with **Pc2** to afford the corresponding bivalent azides. Furthermore, the synthesized compound **(Pc8** and **Pc9)** was reacted with streptavidin in buffer. The details of the results will be presented.



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