

The preparation of dendritic molecule having the binding site for a new generation of PDD or PDT

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ABSTRACT

The preparation of dendritic molecule for photodynamic diagnosis (PDD) or photodynamic therapy (PDT) has been interested on design and synthesis of macromolecule toward a new generation. Herein, the binding site of polyether group is an important role on the construction of macromolecule toward a new generation. Therefore, we will be presented on the preparation of dendritic molecule having the binding site.

Keywords

dendritic molecule, binding site, photodynamic diagnosis or therapy

I. Introduction

The photobiological active molecular model for photodynamic therapy has been attracted as a research for the development of cancer treatment, and more functionalized molecular models have been developed for the research of smart and stable photobiological active molecule systematically [1]. In addition, these systematical researches have been competed on the clinical and molecular level all over the world. Until now, every developed photosensitizer for photodynamic diagnosis (PDD) or photodynamic therapy (PDT) showed photosensitivity and side effect of the skin part for human, and the development of photosensitizer having more smart and less photosensitivity for human has been demanded. Furthermore, the research of the stable photosensitizing molecule showing the longer wavelength and longer life time has been also tried for the development of PDD or PDT. I have been researched the model molecule for PDD or PDT having metal complexes and prepared several types of those complexes having Ru(II) complexes [2]. Herein, I will introduce the design of new dendritic molecule composed of polyether ring unit as binding site for PDD or PDT.

having lanthanide core metal (Eu or Gd) has been designed for the preparation of new metal dendritic molecule because of the longer fluorescence and life time of lanthanide ionic molecule. In particular, this porphyrin molecule can be prepared easily by the synthetic process of amide connection.

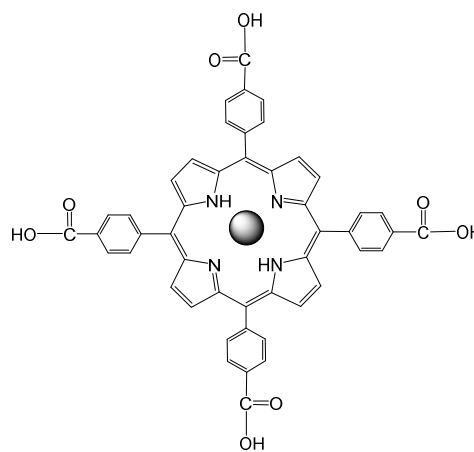


Fig. 1. Porphyrin-tetrabenzoic acid having lanthanide core metal (Eu or Gd) complex

II. Design of porphyrin having core metal

As shown in Fig. 1, Porphyrin-tetrabenzoic acid

In addition, the lanthanide ion such as europium or gadolinium has been used as the application of PDD or PDT. Therefore, this core lanthanide porphyrin

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in plays an important role in the preparation of homo or hetero metal dendritic molecule having the binding site.

III. Lanthanide porphyrin with two polyether rings by amide bond

As shown in Fig. 2, the first target molecule is suggested as lanthanide porphyrin molecule with two polyether rings by amide bond. As reported previously[2], various amide connection molecules have been prepared by easy synthesis and high yield. So, the preparation by amide connection is applied to the first target molecule, and polyether ring is used for the binding site. Particularly, this first target molecule is also applied to the more effective molecule for PDD or PDT. In addition, this dendritic molecule will be interested in the research of energy conversion such as energy or electron transfer by introduction of various metal in the binding site.

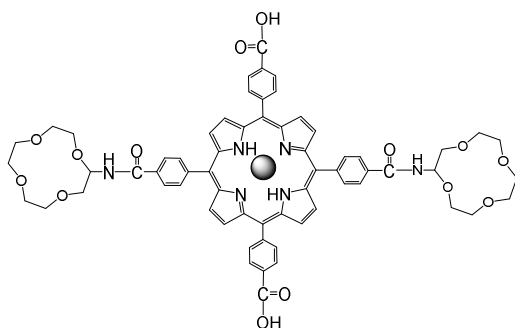


Fig. 2. Lanthanide (Eu or Gd) porphyrin with two polyether rings by amide bond

IV. Lanthanide porphyrin with four polyether rings by amide bond

As shown in Fig. 3, This dendritic molecule has four polyether rings as binding site for the more effective PDD or PDT. In addition, as the synthetic strategy for the preparation of dendritic molecule, the terminal polyether ring unit will be utilized for the preparation of more macro-dendritic molecule as the multilayer.

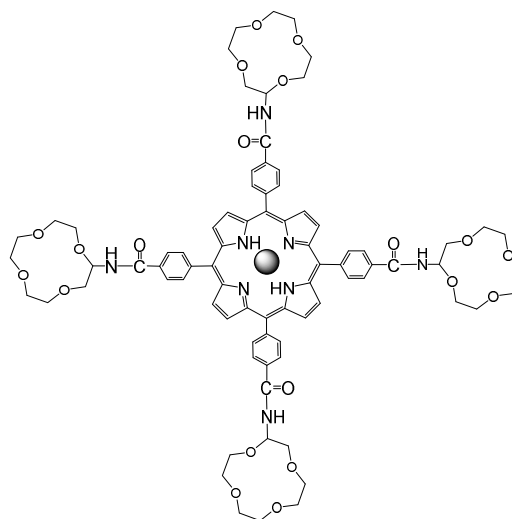


Fig. 3. The core lanthanide (Eu or Gd) porphyrin with four polyether rings by amide bond

Herein, various lanthanide dendritic molecules having polyether ring can be prepared for the development of the molecular design in the research of PDD or PDT as well as the spectroscopic research of new dendritic molecule such as energy harvesting system.

V. Conclusion

The core lanthanide (Eu or Gd) porphyrin having the polyether ring can be well utilized for the more effective PDD or PDT. The introduction of terminal polyether ring unit will be appeared the new photophysical function. In addition, the polyether ring unit can be applied to the preparation of macro-dendritic molecule as well as the research of new photophysical behavior.

References

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