

## S10-3 **Development of photosensitizer-loaded polymeric micelles for enhanced photodynamic therapy**

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Photodynamic therapy (PDT), which involves the systemic administration of photosensitizers (PSs) and the following photoirradiation to the diseased sites, is a promising approach for the treatment of age-related macular degeneration (AMD) and malignant tumors. Here, I will introduce novel polymeric micelles for the delivery of PSs. It is known that most PSs easily form aggregates, resulting in their self-quenching. To prevent the self-quenching of PSs, we developed ionic dendritic photosensitizers (DP), and incorporated them into polymeric micelles. In vitro experiments revealed that polymeric micelles incorporating 3<sup>rd</sup> generation DP showed the highest photocytotoxicity due to effective segregation of the core photosensitizer by the large dendritic wedge. In the animal experiments, we confirmed that DP-loaded micelles showed the effectiveness in the treatment of experimental models of AMD and solid tumors. Also, our results revealed that PDT using DP-loaded micelles did not cause skin phototoxicity, which is a major side effect of current PDT. Based on these results, we applied DP-loaded polymeric micelles for the treatment of bladder cancers, which are known to be intractable due to multiple cancer formation. We demonstrated that DP-loaded micelles showed appreciable PDT efficacy against bladder cancer models while restraining bladder atrophy. These results suggest the utility of DPc-loaded micelles for the effective PDT.