Abstract: AlPcS, a widely used photosensitiser for photodynamic therapy (PDT) of cancer, was conjugated to doxorubicine (Dox), a chemotherapy drug, via the electrostatic binding. AlPcS-Dox conjugation was confirmed by electrophoresis. The AlPcS-Dox conjugates enhanced the cellular uptake of AlPcS three times more than un-conjugated AlPcS in both QGY and RBL cell lines. Moreover, the photodynamic killing effect of the conjugates was remarkably increased as compared to that of AlPcS alone or cytotoxicity of Dox alone, demonstrating an enhanced effect of the AlPcS-Dox conjugates.

Conclusions: The conjugates of AlPcS-Dox can be simply prepared by the electrostatic binding. Such conjugates are taken up by the QGY and RBL cell lines more easily than un-conjugated AlPcS, thus enhancing an intracellular delivery of AlPcS. The increased cellular delivery of AlPcS leads more efficient to cell killing due to a synergistic effect of the AlPcS-PDT and Dox-mediated cytotoxicity. This finding suggests that the conjugation of a photosensitizer to a chemotherapeutic compound can improve photodynamic cancer therapy.

References: