Golgi Apparatus-targeted Aggregation-induced Emission Luminogens for Effective Cancer Photodynamic Therapy

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Golgi apparatus (GA) plays pivotal roles in cells function, including the classification and delivery of newly synthesized/recycled proteins and lipids to their final destinations. Selective GA damaging by photodynamic therapy (PDT) could open up an avenue for effective cancer elimination. Herein, we developed an aggregation-induced emission luminogen (AIEgen) based PS which can specifically target GA via caveolin/raft mediated endocytosis.[1] Distinct morphological change of GA was observed upon the in situ generation of ROS during PDT. Moreover, we found the GA stress can trigger the mitochondria dysfunction during PDT. The GA-mitochondria crosstalk led to the collapse of mitochondria membrane potential (MMP) and ultimately cause cell apoptosis. More importantly, GA targeting TPE-T-CPS show better PDT effect than its non-GA-targeting counterpart TPE-PyT-PS, even though they possess very similar ROS generation rate. This work provides a strategy for the development of PSs with specific GA targeting ability, which is of great importance for precise and effective PDT.

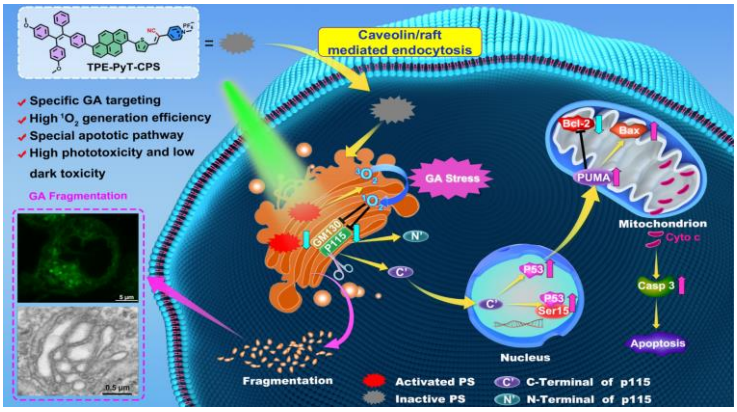

Figure 1. Schematic illustration of AIEgen induced GA stress and the crosstalk between GA and mitochondria for cell apoptosis upon PDT.

References

[1] Liu, M.; Chen, Y.; Guo, Y.; Yuan,H.; Cui, T.; Yao, S.; Jin, S.; Fan, H.; Wang, C.; Xie, R.; He, W.; Guo, Z. *Nat. Commun.* **2022**, *13*, 2179.