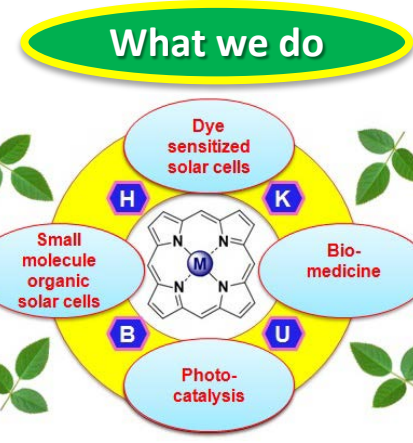


Department of Chemistry

Dr. ZHU, XUNJIN
朱訓進 博士

Porphyrins for Optoelectronic and Biomedical Applications

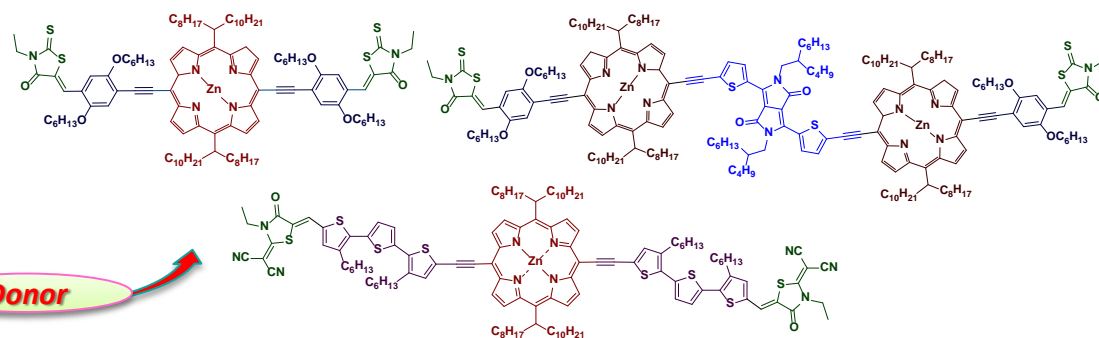
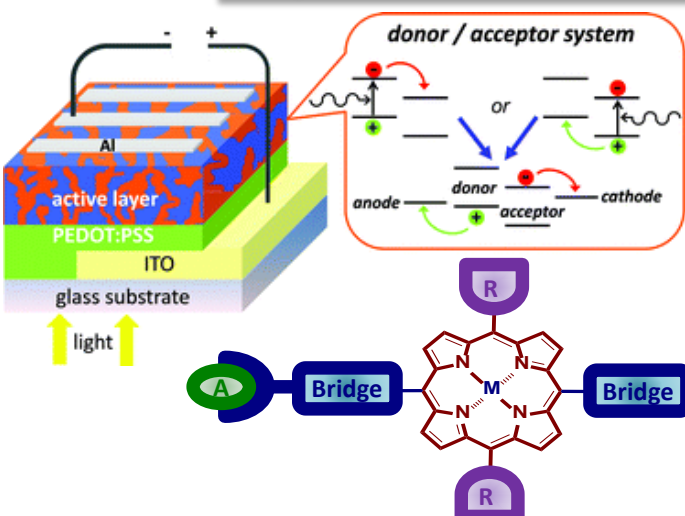
Our research group mainly focus on the design and synthesis of new porphyrin based materials, and their emerging applications in **photovoltaics**, **photocatalysis**, **biomedicine**. The research activities in our group involve the Ph.D. students, Research Associates and Post-docs from the local and overseas. Since 2013, the part of our research work has been published in the renowned journals such as *Chem. Sci.*, *Chem. Mater.*, *Chem. Commun.*, *ACS Appl. Mater. Interfaces*, *J. Mater. Chem. A*, and etc.



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Organic Photovoltaics

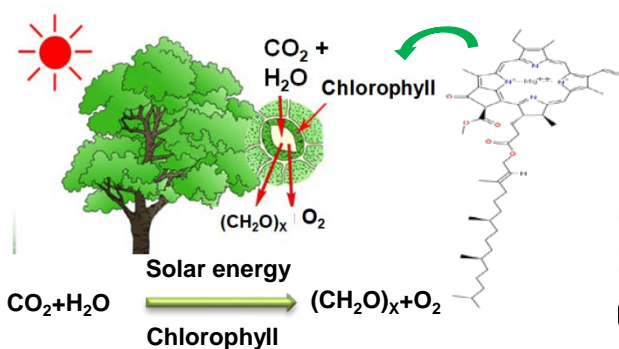
A series of A- π -D- π -A porphyrin small molecules have been constructed from *meso*-alkyl substituted porphyrins as central unit and rhodanine derivatives as terminal group. Using PC₇₁BM as acceptor, and these small molecules as electron donors in solution-processed bulk-heterojunction solar cells, a high power conversion efficiency of 9.5% has been achieved.



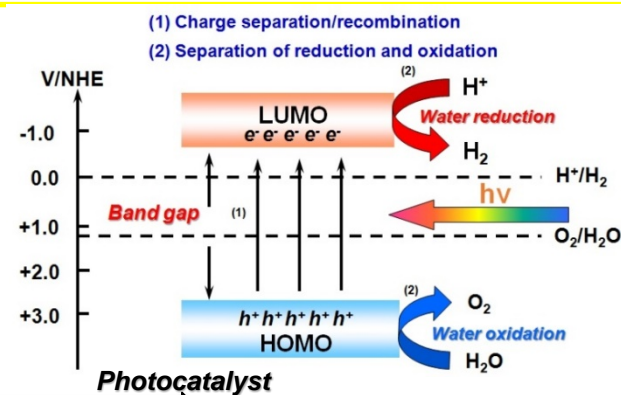
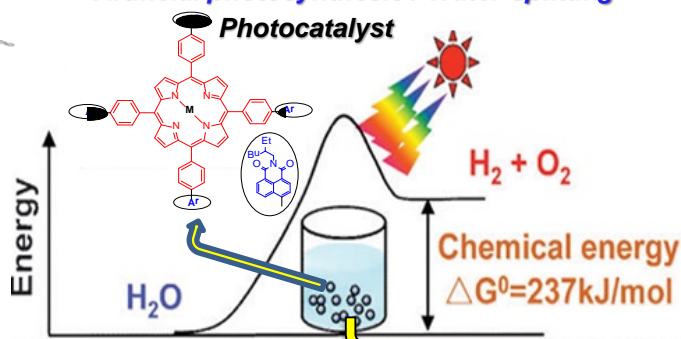
Photocatalysis

Recently, porphyrins with donor-bridge-acceptor are showing very high photocatalytic activity in water-splitting owing to the flexibility of the molecular design to control the exciton separation and transfer.

Natural photosynthesis



Artificial photosynthesis / Water Splitting

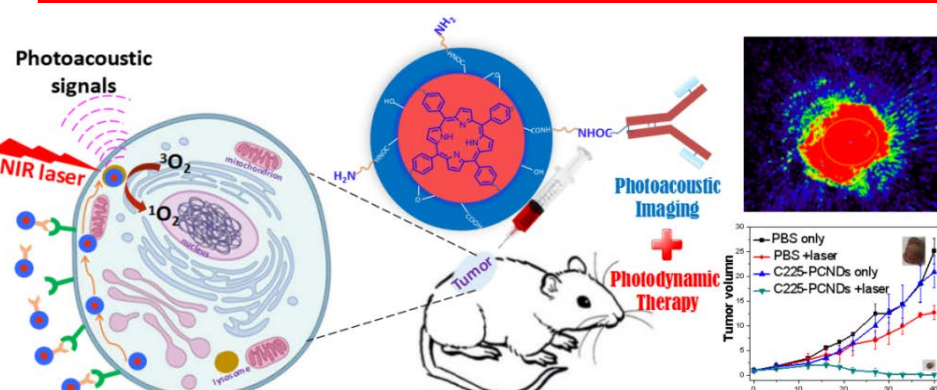


Biomedicine

New porphyrin nanodots (PCNDs) with strong red to near-infrared emission have been prepared by facile one-pot hydrothermal method. In vivo evaluations indicate the Cetuximab conjugated PCNDs provide strong photoacoustic imaging and effective photodynamic therapy in mice bearing MDA-MB-231 breast cancer.



Email: xjzhu@hkbu.edu.hk
orcid.org/0000-0001-7929-6964



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