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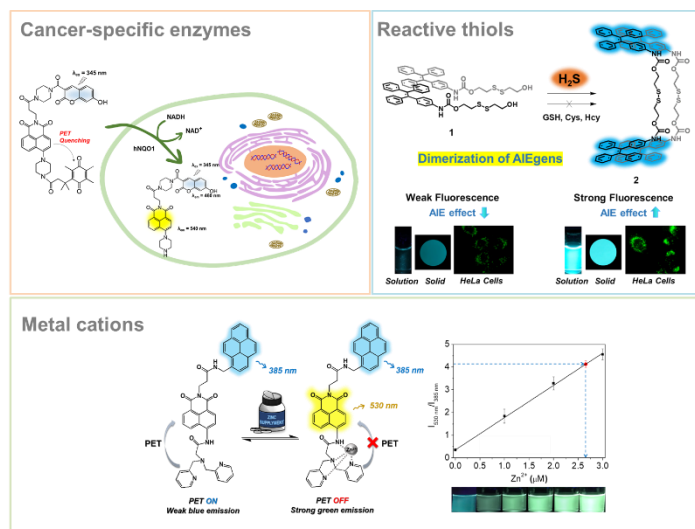
Development of Microenvironment-sensitive Fluorophores:
Application to Sensing, Bioimaging

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The development of selective and sensitive methods for the sensing and imaging of environmental and biological analytes *in vitro* has been received considerable attention. In this regard, we design and synthesize small fluorescent molecules that can give fluorescence and color changes to target molecules and microenvironments in a variety of conditions. The targeted species includes Zn(II) ions, SH₂, NAD(P)H, and cancer-specific human NAD(P)H: Quinone Oxidoreductase (hNQO1), nitroreductase (NTR). Aggregation-induced emission (AIE) and photo-induced electron transfer (PET), internal charge transfer (ICT) were employed as the sensing principles. In addition, these probes were applied to analysis of Zn(II) amount contained in zinc supplement (drug), imaging of cancer-specific enzymes in human living cells, and bacterial imaging, and etc.



References and Notes:

1. M. H. Lee*, J. L. Sessler*, J. S. Kim*, 'Disulfide-based multifunctional conjugates for targeted theranostic drug delivery' *Acc. Chem. Res.* 2935, 48, **2015**.
2. M. H. Lee*, E.-J. Kim, H. Lee, H. M. Kim, M. J. Chang, S. Y. Park, K. S. Hong*, J. S. Kim*, J. L. Sessler*, 'Liposomal Texaphyrin Theranostics for Metastatic Liver Cancer' *J. Am. Chem. Soc.* 16380, 138, **2016**.
3. S. A. Yoon, J. Lee, M. H. Lee*, 'A ratiometric fluorescent probe for Zn²⁺ based on pyrene-appended naphthalimide-dipicolylamine'. *Sensor&Actuator B: Chem.* 50, 258, **2018**.
4. S. Y. Park, M. Won, C. Kang*, J. S. Kim*, M. H. Lee*, 'A coumarin-naphthalimide hybrid as a dual emissive fluorescent probe for hNQO1', *Dye&Pigment*, 341-345, 164, **2019**.
5. M. J. Chang, K. Kim, C. Kang*, M. H. Lee* 'Enhanced Aggregability of AIE-Based Probe through H₂S-Selective Triggered Dimerization and Its Applications to Biological Systems', *ACS Omega*, 7176-7181, 4, **2019**.

Bio-Sketch of the Speaker

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Prof. Min Hee Lee received Ph.D. from Korea University in 2012. After postdoctoral work at The University of Texas at Austin, she began her academic career in 2015 in the Department of Chemistry at Sookmyung Women's University in Seoul. Her research interests are focused on the development of novel fluorescence-based smart molecules for applications in the sensing and imaging of bioactive species and theranostic drug delivery systems.

Representative Publications

1. Disulfide-based multifunctional conjugates for targeted theranostic drug delivery, M. H. Lee, J. L. Sessler, J. S. Kim, *Acc. Chem. Res.* **2935**, 48, **2015**.
2. Liposomal Texaphyrin Theranostics for Metastatic Liver Cancer, M. H. Lee, E.-J. Kim, H. Lee, H. M. Kim, M. J. Chang, S. Y. Park, K. S. Hong, J. S. Kim, J. L. Sessler, *J. Am. Chem. Soc.* 16380, *138*, **2016**.
3. An endoplasmic reticulum-selective ratiometric fluorescent probe for imaging a copper pool, S. Y. Park, W. Kim, S. H. Park, J. Han, J. Lee, C. Kang, and M. H. Lee, *Chem. Commun.* 4457, *53*, **2017**.
4. High-depth fluorescence imaging using a two-photon FRET system for mitochondrial pH in live cells and tissue, M. J. Chang, K. Kim, K. S. Park, J. S. Kang, C. S. Lim, H. M. Kim, C. Kang, M. H. Lee, *Chem. Commun.* 13531, *54*, **2018**.
5. Fluorogenic reaction-based prodrug conjugates as targeted cancer theranostics, M. H. Lee, A. Sharma, M. J. Chang, J. Lee, S. Son, J. L. Sessler, C. Kang, J. S. Kim, *Chem. Soc. Rev.* 28, *47*, **2018**. (*inside front cover*)