

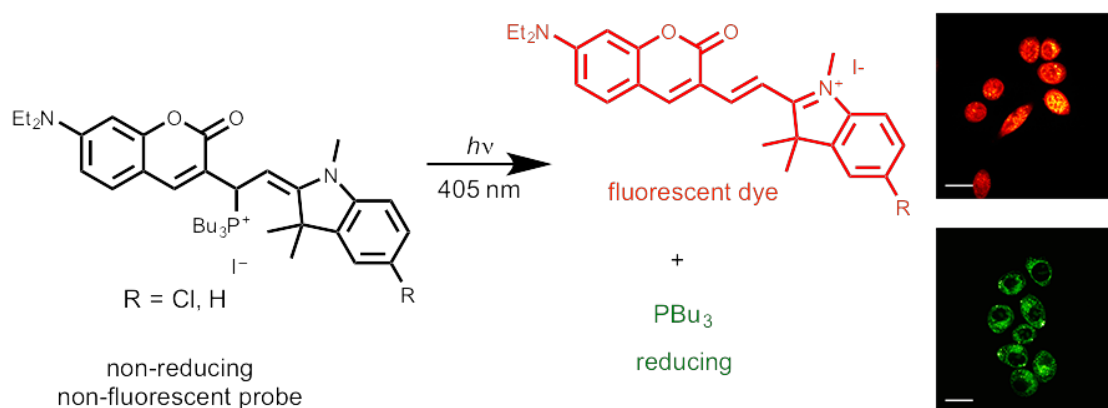
Photoactivatable phosphine probes for the induction of intracellular reductive stress

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Reductive stress is a result of redox homeostasis imbalance towards more reducing species inside the cell.^[1] This condition has been associated with numerous pathologies, such as cancer, inflammation, metabolic disorders and neurodegenerative diseases. Reductive stress can be induced by some pharmacological agents which contain free thiols, but, even though efficient, these reagents lack spatiotemporal resolution.^[2,3]

Photoactivatable probes are an important class of molecules as they can be used to release bioactive compounds with spatiotemporal control.^[4,5] We have developed a photoactivatable phosphine probe that is cell-permeable, and, upon photoactivation, releases a fluorescent reporter dye and a trialkylphosphine that induces intracellular reductive stress, followed by formation of protein aggregates which were identified with Thioflavin T.^[6]



[1] M. Wang, R. J. Kaufman, *Nature*, **2016**, 529, 326–335.

[2] H. Zhang, P. Limphong, J. Pieper, Q. Liu, C. K. Rodesch, E. Christians, I. J. Benjamin, *FASEB J.*, **2012**, 26, 1442–1451.

[3] A. Trivedi, P. S. Mavi, D. Bhatt, A. Kumar, *Nat. Commun.*, **2016**, 7, 11392.

[4] P. Klán, T. Šolomek, C. G. Bochet, A. Blanc, R. Givens, M. Rubina, V. Popik, A. Kostikov, J. Wirz, *Chem. Rev.*, **2013**, 113, 119–191.

[5] C. Brieke, F. Rohrbach, A. Gottschalk, G. Mayer, A. Heckel, *Angew. Chem. Int. Ed.*, **2012**, 51, 8446–8476.

[6] A. Tirla, P. Rivera-Fuentes, *Angew. Chem. Int. Ed.*, **2016**, 55, 14709–14712.