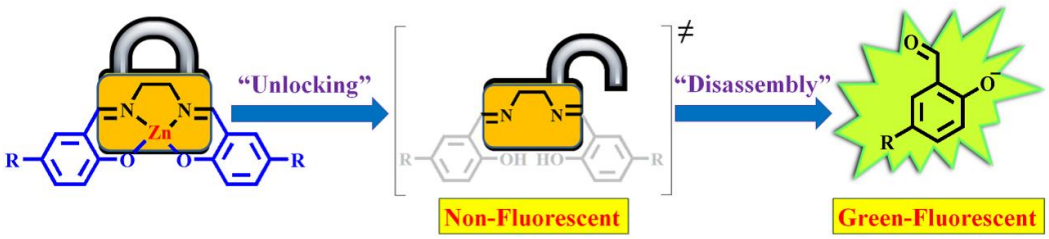
A Disassembly Approach for Imaging Endogenous Pyrophosphate in Living Cells using Metal-Salen Complexes

P. Yadav[1], N. Kumari[1], Z. J. Huang[2], H. Chao[2], G. Gasser[3], F. Zelder[1]*

[1]Department of Chemistry, University of Zurich, Winterthurerstrasse 190, 8057 Zurich (Switzerland), [2]School of Chemistry and Chemical Engineering, Sun Yat-Sen University, Guangzhou 510275 (P.R. China) , [3]Chimie ParisTech, PSL Research University, 11, Rue Pierre et Marie Curie, F-75005 Paris (France)

In this poster, a stimulus-induced disassembly approach in water is presented[1]. In this approach, an analyte sequesters selectively a metal ion from a metal-chelate complex, leaving behind the "unlocked" ligand. This metal free ligand then hydrolyses into its molecular subunits. This hydrolysis reaction induced by the analyte binding to the metal is detectable as the optical properties of the free ligand and the hydrolysed species are distinguishable.

The focus is on the fluorometric detection of pyrophosphate which is an important diagnostic marker in many diseases like cancer, with metal salen complexes in water and biological media.[1-3] Initially, the intrinsic fluorescence of the salicyaldehyde is quenched in the metal complex, but reverts back during the disassembly of the salen ligand.



Unprecedented applications of this strategy for endogenous pyrophosphate detection in the mitochondria of bacterial cells are presented.[4]

Ongoing research focuses on synthesizing optimized probes for targeting various cell organelles.

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[3] S. Bhowmik, B. N. Ghosh, V. Marjomäki, K.Rissanen, *J. Am. Chem. Soc.*, **2014**, *136*, 5543–5546.
[4] N. Kumari, H. Huang, H. Chao, G. Gasser, F. Zelder, *ChemBioChem* **2016**, 17, 1211-1215.