Turn-on Fluorescent Peptide Conjugate for the Detection of Human Monoamine Oxidases Enzymes

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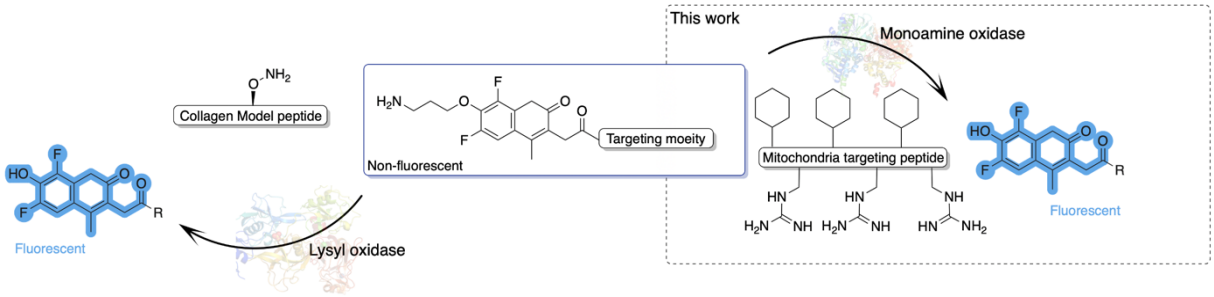
Monoamine oxidase (MAO) enzymes catalyze the deamination of biogenic amines including neurotransmitters. MAOs exist as two isoforms (MAO-A and MAO-B) that are localized in the outer membrane of mitochondria. They differ in substrate and inhibitor specificity as well as in tissue distribution. MAO-A is closely linked to psychiatric disorders whereas MAO-B is involved in the development of neurodegenerative diseases.[1] Due to their crucial role in maintaining the balance of amines, tools to monitor the activity of these enzymes are important.[2]

Our group has recently developed an enzyme reactive fluorescent sensor[3] that detects a related class of amino oxidases, lysyl oxidases (LOXs). Here, we introduce the enzyme reactive fluorescent probe as a sensor for the detection of MAOs. Enzymatic assay revealed a preference of the sensor for MAO-B over MAO-A. Conjugation of the sensor with peptides that selectively localize in mitochondria[4], allowed for the delivery of the sensor to the location of MAO and activity studies in MCF-7 cells using confocal microscopy and fluorescence-activated cell sorting (FACS) analysis.



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