

Photoresponsive ligand

The binding with the object can be adjusted by the structural change caused by the irradiation light wavelength

Overview

Dihydrofolate reductase (DHFR) is known as a target of the anticancer drug MTX, and research tools (kits for evaluating protein subcellular localization, etc.) utilizing the binding between Escherichia coli DHFR (eDHFR) and MTX or its analogues have been reported and sold. The inventors developed azoMTX, in which an azo group is introduced into MTX, and found that the binding to eDHFR by light irradiation can be regulated. They also found that the kinetics of eDHFR fusion protein expressed in cells can be manipulated by light using azoMTX derivatives.

【effect】

- The structure of azoMTX is reversibly changed by light irradiation of a specific wavelength. The cis of azoMTX produced under UV irradiation strongly bound to eDHFR and inhibited its enzymatic activity, while the trans of azoMTX produced under visible light irradiation decreased the binding strength to eDHFR and the enzymatic reaction proceeded.
- The target protein was expressed as a fusion protein with eDHFR, and intracellular kinetics (localization) could be reversibly photomanipulated using an azoMTX derivative.

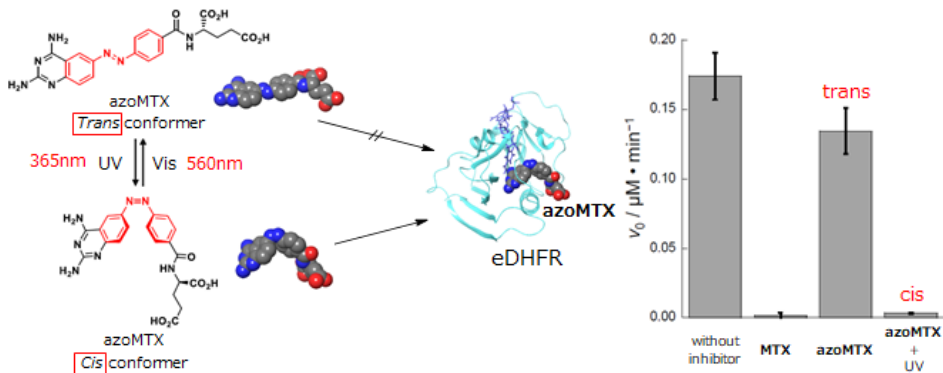
Product Application

- ☐ Photoresponsive agent
- ☐ Light Control of Intracellular Dynamics of eDHFR Fusion Proteins

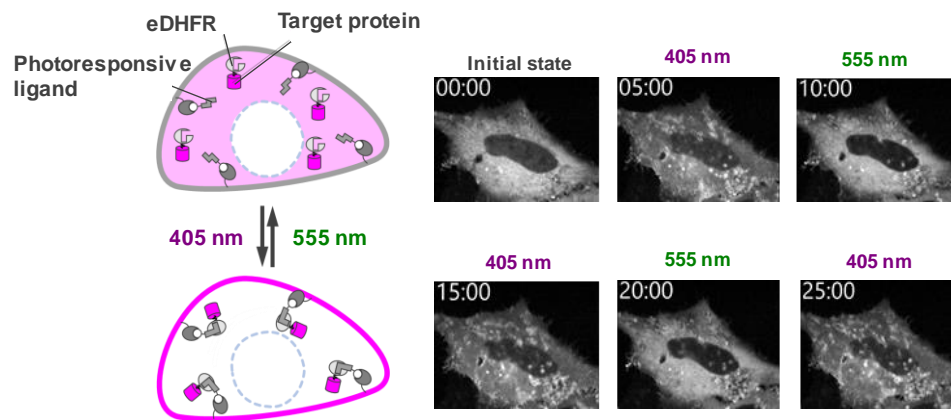
IP Data

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Basic Technology Concept and Light Control of eDHFR Activity[1]



Reversible Photoregulation of Intracellular Dynamics of eDHFR Fusion Proteins



Related Works

[1] *ChemBioChem* **2019**, *20*, 1382-1386.

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