Fura-2, AM Ester

Fura-2, AM ester is a ratiometric calcium indicator that is membrane-permeant and can thus be loaded into cells via incubation.

Product attributes

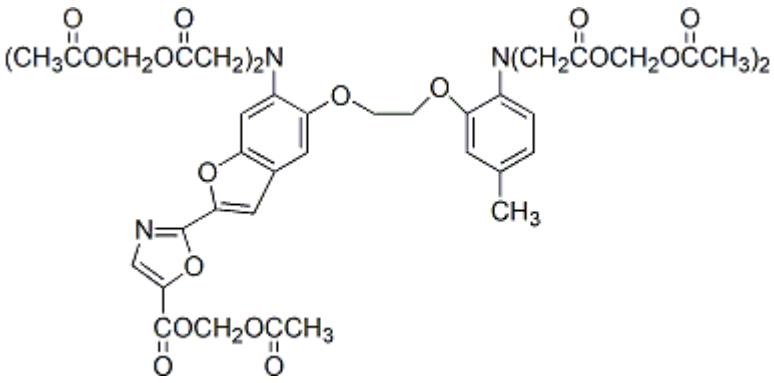
Cell permeability	Membrane permeant
Indicator type	Ratiometric
CAS number	108964-32-5
Excitation/Emission	363/512 nm (no Ca2+); 335/505 nm (high Ca2+) (after hydrolysis)

Product Description

Fura-2, AM ester is a ratiometric fluorescent dye that binds to free intracellular calcium, and is the preferred dye for ratiometric imaging microscopy. Fura-2, AM ester is membrane-permeant and thus can be loaded into cells via incubation. Because of the relatively low water solubility of the AM ester, the mild detergent Pluronic® F-127 (cat# 59004) is often used as a dispersing agent to facilitate cell loading. Fura-2, AM ester itself does not bind Ca^{2+}, but it is readily hydrolyzed to Fura-2 by endogenous esterases once it enters cells.

Fura-2 fluorescence can be detected using flow cytometry, fluorescence microscopy, or certain fluoresence microplate readers. Upon calcium binding, the fluorescent excitation maximum of the indicator undergoes a blue shift from 363 nm (Ca^{2+}-free) to 335 nm (Ca^{2+}-saturated), while the fluorescence emission maximum is relatively unchanged at ~510 nm. A major use of Fura-2 is in drug discovery, for measuring intracellular calcium mobilization after activation of G protein-coupled receptors (GPCRs) and calcium channels.

- Light yellow solid soluble in DMSO
- Store at -20°C and protect from light, especially in solution
- K_d: 145 nM (22°C in pH 7.2 buffer) (after hydrolysis)
- $\lambda_{Ex}/\lambda_{Em}$ (no Ca^{2+}) = 363/512 nm; $\lambda_{Ex}/\lambda_{Em}$ (high Ca^{2+}) = 335/505 nm (after hydrolysis)
- ε (363 nm, no Ca^{2+}) = 27,000 $M^{-1}cm^{-1}$; ε (335 nm, high Ca^{2+}) = 35,000 $M^{-1}cm^{-1}$ (after hydrolysis)
- $C_{44}H_{47}N_3O_{24}$
- MW: 1001.9
- [108964-32-5]



BAPTA-based ion indicators like Fura-2 have been shown to be fixable in situ by EDC/EDAC (cat# 59002) . The fixation of indicator dyes is useful for downstream immunofluorescence and IHC studies (Cell Calcium 1997, 21(3), 175).

As the indicator does not covalently bind to cellular components, it may be actively effluxed from the cell by organic anion transporters. The rate of efflux increases with temperature, and may vary between cell types, resulting in variable retention times of a few minutes to hours. Experiments using indicators in cells usually are performed within one or two hours of loading, but it may be possible to re-load cells with indicator if needed. The organic anion transporter inhibitor Probenecid (#50027) can be used to slow the rate of indicator efflux from cells.

Fura-2 Products

Product	Unit Size	Catalog Number
Fura-2, pentaammonium salt	1 mg	50030
Fura-2, pentapotassium salt	1 mg	50031
Fura-2, pentasodium salt	1 mg	50032
Fura-2, AM ester	10 x 100 ug	50033
20 x 50 ug	50033-1	
1 mg	50034	
Fura-2, AM ester, 1 mM solution	1 mL	50029

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References

1. Am J Physiol 263, 1292 (1992), DOI: 10.1152/ajpheart.1992.263.4.H1292
2. J Mol Cell Cardiol 24, 937 (1992), DOI: 10.1016/0022-2828(92)91861-X
3. Methods Cell Biol, 99, 113, (2021), DOI: 10.1016/B978-0-12-374841-6.00005-0

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