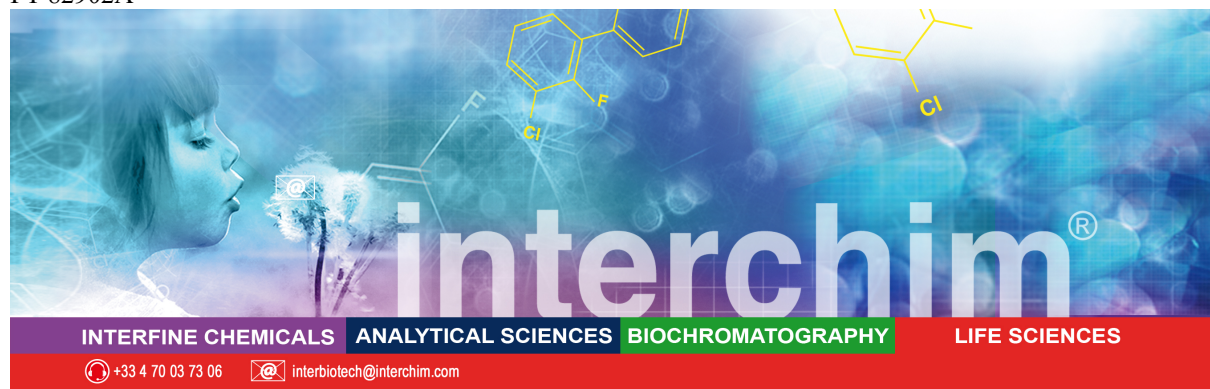


FT-82902A



SBFI

A cell permeant sodium selective fluorescent indicator that can be loaded into the cell where it is hydrolysed by cytosolic esterases and trapped as the active chelator.

Product Information

| | |
|--------------------------------|---|
| Name : | SBFI, AM |
| Catalog Number : | FP-82902A , 1 mg FP-82902B, 50*20 µg |
| Structure : | C ₅₆ H ₅₈ N ₂ O ₂₃ |
| Molecular Weight : | MW= 1127.09 |
| Soluble: | DMSO |
| Absorption / Emission : | $\lambda_{exc} \backslash \lambda_{em}$ (low [Na ⁺]) = 339 / 565 nm; EC= 45 000 M ⁻¹ cm ⁻¹ $\lambda_{exc} \backslash \lambda_{em}$ (high [Na ⁺]) = 333 / 539 nm; EC= 52 000 M ⁻¹ cm ⁻¹ |
| K_d : | 3.8 mM |

| | |
|--------------------------------|---|
| Name : | SBFI, K salt |
| Catalog Number : | FP-AM612A , 1 mg |
| Structure : | C ₄₄ H ₃₈ O ₁₅ K ₄ |
| Molecular Weight : | MW= 963.19 |
| Soluble: | In water (pH>8.0) |
| Absorption / Emission : | $\lambda_{exc} \backslash \lambda_{em}$ (low [Na ⁺]) = 339 / 565 nm; EC= 45 000 M ⁻¹ cm ⁻¹ $\lambda_{exc} \backslash \lambda_{em}$ (high [Na ⁺]) = 333 / 539 nm; EC= 52 000 M ⁻¹ cm ⁻¹ |
| K_d : | 3.8 mM |

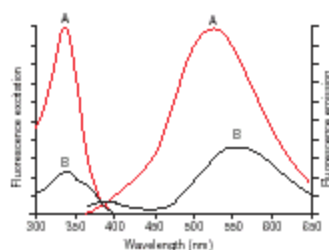
Storage: Store at -20°C_(M) and protect from light

Introduction

SBFI is a ratiometric, sodium sensitive dye, 18 times more selective for Na⁺ than K⁺. It exhibits 2.5-fold enhancement of fluorescence upon binding and can be used in ratiometric methods. Fluorescence is relatively unaffected by changes in pH above 6.2.

SBFI can be used combined with other fluorescent indicators to correlate changes in intracellular Na⁺ with Ca²⁺ and Mg²⁺ concentrations, intracellular pH and membrane potential (i.e. DiBAC4(3)).

Emission spectra of SBFI with NaCl in presence of KCl ([Na⁺] + [K⁺] : 135 mM). Effective K_d : ca 17mM.



Fluorescence excitation spectra and emission spectra in presence of 135 mM(A) or zero (B) Na⁺.

Directions for use

Handling and Storage

Indicator salts : stock solutions of the salts may be prepared in distilled water or aqueous buffers (pH>6) and stored frozen (<-20°C) and protected from light; these solutions should be stable for at least six months.

Indicator salt are orange red solid and soluble in DMSO and water (pH >6)

AM esters should be reconstituted in anhydrous dimethylsulfoxide (DMSO) then used as soon as possible thereafter (within a week) to avoid hydrolysis with subsequent loss of cell loading capacity. DMSO stock solutions of AM esters should be frozen and desiccated and protect from light.

Guidelines for use

A stock solution of the AM esters may be prepared by dissolving SBFI in anhydrous DMSO to a concentration of 10 mM. It is often more convenient and effective to add the non-ionic detergent Pluronic® F-127 to get further a better dissolution of AM indicator: mix the AM ester stock solution in DMSO with an equal volume of 20% (w/v) Pluronic® F-127 in DMSO before dilution in the loading medium, making the final Pluronic® F-127 concentration about 0.02%.

Loading concentrations range from 5 µM to 10 µM and loading times vary between 40 minutes and 4 hours.

SBFI salt can be loaded into cells by diffusion from a patch pipette for correlated fluorescence imaging and electrophysiological recording. Because the K_d of the indicator may be different in cells than in solution, intracellular SBFI should be calibrated using the pore-forming antibiotic gramicidin, and intracellular PBF1 using the K⁺ ionophore valinomycin.

Measurements are generally made by exciting these indicators at 340 nm, where fluorescence is particularly sensitive to the ion concentration of interest, and at 380 nm, very near the isosbestic point. The ratio of the fluorescence intensities obtained by exciting SBFI at these wavelengths (340/380 nm) while monitoring emission at 500 nm is then used to determine the concentration of the Na⁺ or K⁺ respectively. Dual-excitation filter sets for fluorescence microscopy applications are available from Omega Optical Inc. (www.omegafilters.com, set XF04) and Chroma Technology Corp. (www.chroma.com, set 71000).

Protocol may be found in the literature.

Related products

- SBFIndo (the Indo version), [FP-BB4190](#)
- SBFO (the Fura version), [FP-BB4170](#)
- Pluronic® acid F-127: [FP-37361A](#), [FP-69806A](#)
- DiBAC4(3), [FP-46600A](#)

References

- **Borin M, et al.**, « Stimulation by thrombin increases the cytosolic free Na⁺ concentration in human platelets. Studies with the novel fluorescent cytosolic Na⁺ indicator sodium-binding benzofuran isophthalate », *J. Biol. Chem.*, **265**, 19543(1990) [article](#)

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- **Borle A. B.**, *et al.*, « Effects of low extracellular Ca²⁺ on cytosolic free Ca²⁺, Na⁺, and pH of MDCK cells », *Am J Physiol Cell Physiol*, **259**, 19 (1990) [abstract](#)
- **Diarra A.** *et al.*, In situ calibration and [H⁺] sensitivity of the fluorescent Na⁺ indicator SBFI, *Am J Physiol Cell Physiol*, 280: C1623 - C1633 (2001) [Article](#)
- **Donoso P.** *et al.*, « Fluorescence measurements of cytoplasmic and mitochondrial sodium concentration in rat ventricular myocytes », *The Journal of Physiology*, **448**, 493(1992) [abstract](#)
- **Fang K.-W.** *et al.*, Free fatty acids act as endogenous ionophores, resulting in Na⁺ and Ca²⁺ influx and myocyte apoptosis, *Cardiovasc Res*, 10.1093/cvr/cvn030 (2008) [Article](#)
- **Harootunian AT.** *et al.*, «Fluorescence ratio imaging of cytosolic free Na⁺ in individual fibroblasts and lymphocytes », *J. Biol. Chem.*, **264**, 19458(1989) [article](#)
- **Jezek P.** *et al.*, « Reconstitution of the beef heart and rat liver mitochondrial K⁺/H⁺ (Na⁺/H⁺) antiporter. Quantitation of K⁺ transport with the novel fluorescent probe, PBFI », *J. Biol. Chem.*, **265**, 10522(1990) [article](#)
- **Kasner SE.** *et al.*, « Regulation of intracellular potassium in mesangial cells: a fluorescence analysis using the dye, PBFI. », *Am J Physiol.*, **262**, F462 (1992) [abstract](#)
- **Minta A.** *et al.*, « Fluorescent indicators for cytosolic sodium », *J. Biol. Chem.*, **264**, 19449 (1989) [article](#)
- **Negulescu PA.** *et al.*, «Intracellular ion activities and membrane transport in parietal cells measured with fluorescent dyes. », *Methods Enzymol.*, **192**, 38 (1990)
- **Swift F.** *et al.*, The Na⁺/K⁺-ATPase α 2-isoform regulates cardiac contractility in rat cardiomyocytes, *Cardiovasc Res*, 75: 109 - 117 (2007) [Article](#)
- **Tsubokawa H.** *et al.*, « Elevation of intracellular Na⁺ induced by hyperpolarization at the dendrites of pyramidal neurones of mouse hippocampus », *The Journal of Physiology* 517, 135(1999) [article](#)
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Ordering information

Catalog size quantities and prices may be found at <http://www.fluoprobes.com>

Please inquire for higher quantities (availability, shipment conditions).

For any information, please ask : FluoProbes / Interchim; Hotline : +33(0)4 70 03 73 06

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