

Two major dyes are used for Na⁺ and K⁺ studies, having more or less overlapping specificities as they are based on the same structure : SBFI for Na⁺, and PBFI for K⁺. SBFI is much more Na⁺ selective than PBFI. Now SQI dyes are promising for potential measurements thanks to their excellent Na⁺ specificities.

PBFI (K⁺ indicators)

abs em. PBFI-AM

C₅₈H₆₂N₂O₂₄ MW : 1171.14

Soluble in DMSO

Spectra after hydrolysis as PBFI salt

Potassium sensitive dye, 1.5 times more selective for K⁺ than Na⁺.

It is an alternative to K⁺ efflux assays using ⁸⁶Rb, used in FCM.

Applications : receptor and ion channels studies.

Description	Cat.#	Qty
PBFI-AM	FP-86164A	1 mg
	FP-86164B	20 x 50 µg

abs em. PBFI, NH₄ salt

C₄₆H₅₈N₆O₁₆ MW : 951.01

Soluble in methanol

λ_{exc.}/λ_{em.} (low [K⁺]) : 336/557 nm ; EC : 33 000 M⁻¹cm⁻¹

λ_{exc.}/λ_{em.} (high [K⁺]) : 338/507 nm ; EC : 41 000 M⁻¹cm⁻¹

K_d : 5,1 mM

Cell impermeant, but can be microinjected.

Description	Cat.#	Qty
PBFI, NH ₄ salt	FP-86166A	1 mg

SBFI (Na⁺ indicators)

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.

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)).

abs em. SBFI, AM

C₅₆H₅₈N₂O₂₃ MW : 1127.09

Soluble in DMSO

Store at 4°C and protect from light

λ_{exc.}/λ_{em.} (hydrolyzed) : see SBFI salt (FP-22403)

Cell permeant. Hydrolysis of AM group in cells yields the SBFI dye (FP-22403).

Description	Cat.#	Qty
SBFI, AM	FP-82902A	1 mg
	FP-82902B	50 x 20 µg

abs em. SBFI, K salt

C₄₄H₃₈O₁₅K₄₁ MW : 993.19

Soluble in water (pH > 8)

Store at 4°C and protect from light

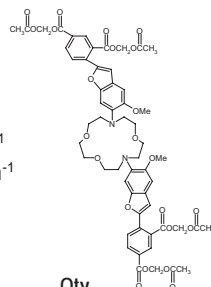
λ_{exc.}/λ_{em.} (low [Na⁺]) : 339/565 nm ; EC : 45 000 M⁻¹cm⁻¹

λ_{exc.}/λ_{em.} (high [Na⁺]) : 333/539 nm ; EC : 52 000 M⁻¹cm⁻¹

K_d : 3.8 mM

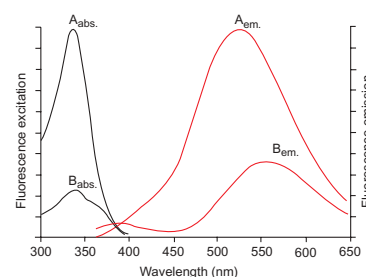
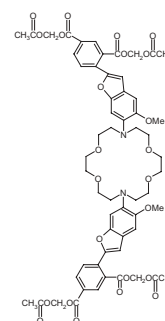
K_d : (135 nm Na⁺K) : 17 nm

Description	Cat.#	Qty
SBFI, K salt	FP-AM612A	1 mg



Technical tip

- ◆ K⁺ intracellular levels are involved in many cell physiology aspects, however a few applications are well identified. K⁺ studies have been useful in apoptosis, mitochondrial activity, plant cell vacuoles, neurology.
- ◆ Na⁺ has been more largely assessed, especially in blood, brain, and muscle sciences.



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

Associated products

Pluronic®F-127

Useful for AM dye loading.

Description	Cat.#	Qty
Pluronic®F-127	FP-37361A	1 g

Valinomycin

C₅₄H₉₀N₆O₁₈ MW : 1111.33

Store at -20°C and protect from light

A K⁺ ionophore used to calibrate intracellular indicator

Description	Cat.#	Qty
Valinomycin	FP-09246B	25 mg

Tetrodotoxin

A sodium channel blocker. See section XX.

Description	Cat.#	Qty
Tetrodotoxin	FP-31496A	1 mg

Gramicidin

Store at 4°C ; MW : ca 1880

A pore-forming agent used to calibrate intracellular indicator.

Description	Cat.#	Qty
Gramicidin	FP-31509A	100 mg

SQI ionophore

Description	Cat.#	Qty
SQI ionophore	FP-AM700A	100 mg

Related products :

- SBFI-NHS (amine reactive derivative of SBFI)
- SBFIIndo (the Indo version of SBFI, as AM ester FP-BB419, and K salt FP-BB420)
- SBFO (the Fura version of SBFI, as AM ester FP-BB417 and K salt FP-BB418)

Cell Biology - Study/Probes

Fluorescent K⁺ and Na⁺ Indicators

SQI ionophores

SQI ionophores are used in electrophysiology, notably combined to potential membrane probes. SQI-Pr has become the ionophore of choice for studying cell membrane potentials, thanks to its Na⁺ specificity, comparable to valinomycin for K⁺.

abs em. SQI-Pr (Na)

C₄₂H₆₀N₄O₇ MW : 732.97

Soluble in MeOH

Store at 4°C and protect from light

$\lambda_{exc.}/\lambda_{em.}$: 350/475 nm ; EC : 5 000 M⁻¹cm⁻¹

Synthetic ionophore for sodium. SQI-Pr is effective at concentrations of 1 - 10 μ M in creating Na⁺ conductance in erythrocytes. Selectivity for Sodium over Potassium is 100:1.

Description

SQI-Pr (Na)

Cat.#

FP-AM700A

Qty

500 μ g

abs em. SQI-Et (Na)

MW : 676.80

Soluble in DMSO

Store at 4°C and protect from light

$\lambda_{exc.}/\lambda_{em.}$: 350/475 nm

Ionophore. Selectivity for Sodium over Potassium is 90:1. It is used at 40 μ M.

Description

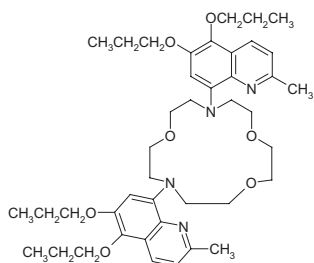
SQI-Et (Na)

Cat.#

FP-AM698A

Qty

500 μ g



Related product

Pluronic® F-127

Useful for AM dye loading.

Description	Cat.#	Qty
Pluronic®F-127	FP-37361A	1 g