SoNa™ 520 AM

Catalog number: 21323, 21324
Unit size: 1 mg, 10x50 ug

Component	Storage	Amount (Cat No. 21323)	Amount (Cat No. 21324)
SoNa™ 520 AM	Freeze (< -15 °C), Minimize light exposure	1 mg	10 x 50 ug

OVERVIEW

SoNa™ 520 AM is the cell-permeable version of SoNa™ 520 used for monitoring sodium ion in live cells. SoNa™ 520 is a new sodium-sensitive fluorescent indicator dye used to detect sodium levels biological samples. It is a fluorescent dye that undergoes a great enhancement in fluorescence intensity upon binding to sodium ions. By measuring the emitted fluorescence intensities, researchers can assess the sodium ion concentration within a biological sample or study how sodium ion changes upon a biological stimulation. It perhaps has the highest detection sensitivity compared to other well-known fluorescent sodium ion indicators such as SBFI and Corona Red. It can be employed to measure changes in sodium concentration in living cells and other biological samples. Compared to the most common SBFI, SoNa™ 520 is much more sensitive with a much larger fluorescence response under the same conditions. In addition, SoNa™ 520 can be well excited with the visible 488 nm laser or similar visible light to avoid the UV excitation that is required for exciting SBFI. In general, UV excitation causes great damage to cells and other biological samples, and also photobleaches the dye probes much more quickly than the visible light. The use of a sodium ion indicator allows scientists to investigate various physiological processes related to sodium, such as sodium ion channel activity, cell signaling, and sodium homeostasis. SoNa™ 520 provides valuable insights into cellular mechanisms and can be utilized in fields like neuroscience, cardiology, and cellular biology.

KEY PARAMETERS

Fluorescence microscope

Emission	FITC
Excitation	FITC
Recommended plate	Black wall/clear bottom

Fluorescence microplate reader

Cutoff	515
Emission	525
Excitation	490
Recommended plate	Black wall/clear bottom
Instrument specification(s)	Bottom read mode/Programmable liquid handling

PREPARATION OF STOCK SOLUTIONS

Unless otherwise noted, all unused stock solutions should be divided into single-use aliquots and stored at -20 °C after preparation. Avoid repeated freeze-thaw cycles

SoNa™ 520 AM Stock Solution

Prepare a 2 to 5 mM stock solution of SoNa™ 520 AM in high-quality, anhydrous DMSO.

PREPARATION OF WORKING SOLUTION

SoNa™ 520 AM Working Solution

On the day of the experiment, either dissolve SoNa™ 520 AM in DMSO or thaw an aliquot of the indicator stock solution to room temperature. Prepare a dye working solution of 2 to 20 μM in a buffer of your choice (e.g., Hanks and Hepes buffer) with 0.04% Pluronic® F-127. For most cell lines, SoNa™ 520 at a final concentration of 5-10 μM is recommended. The exact concentration of indicators required for cell loading must be determined empirically.

Note: The nonionic detergent Pluronic® F-127 is sometimes used to increase the aqueous solubility of SoNa™ 520 AM. A variety of Pluronic® F-127 solutions can be purchased from AAT Bioquest.

Note: If your cells contain organic anion-transporters, probenecid (1-2 mM) may be added to the dye working solution (final in well concentration will be 0.5-1 mM) to reduce leakage of the de-esterified indicators. A variety of ReadiUse™ probenecid products, including water-soluble, sodium salt, and stabilized solutions, can be purchased from AAT Bioquest.

SAMPLE EXPERIMENTAL PROTOCOL

Following is our recommended protocol for loading AM esters into live cells. This protocol only provides a guideline and should be modified according to your specific needs.

1. Prepare cells in growth medium overnight.
2. On the next day, add 1X SoNa™ 520 AM working solution to your cell plate.

   Note: If your compound(s) interfere with the serum, replace the growth medium with fresh HHBS buffer before dye-loading.

3. Incubate the dye-loaded plate in a cell incubator at 37 °C for 1 to 2 hours.

   Note: Incubating the dye for longer than 2 hours can improve signal intensities in certain cell lines.

4. Replace the dye working solution with HHBS or buffer of your choice (containing an anion transporter inhibitor, such as 1 mM probenecid, if applicable) to remove any excess probes.
5. Add the stimulant as desired and simultaneously measure fluorescence using either a fluorescence microscope equipped with a FITC filter set or a fluorescence plate reader containing a programmable liquid handling system such as an FDSS, FLIPR, or FlexStation, at Ex/Em = 490/525 nm cutoff 515 nm.

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EXAMPLE DATA ANALYSIS AND FIGURES

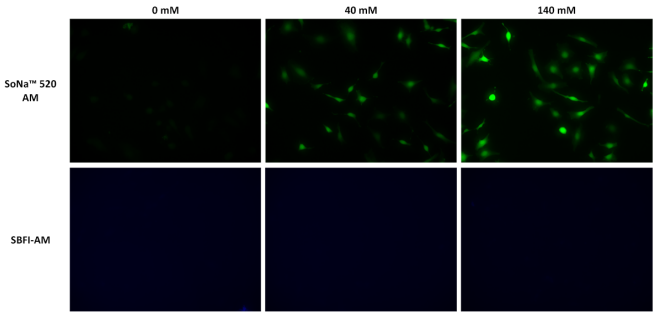

Figure 1. Response of Gramicidin A with varying sodium ion concentrations in HeLa cells. HeLa cells were seeded overnight at 40,000 cells/100 µL/well in a 96-well Costar plate. 100 µL of SoNa™ 520 AM or SBFI-AM in HHBS with 0.02% PF-127 was added, and cells were incubated at 37 °C for 1 hour. Dye-loading mediums were replaced with 100 µL HHBS containing Gramicidin A (0, 40, and 140 mM sodium ions). After 30 minutes, images were captured using a fluorescence microscope (Olympus IX71) with the FITC channel.

DISCLAIMER

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