SoNa™ 520

Catalog number: 21320, 21321
Unit size: 1 mg, 10x50 ug

Component	Storage	Amount (Cat No. 21320)	Amount (Cat No. 21321)
SoNa™ 520	Freeze (< -15 °C), Minimize light exposure	1 mg	10 x 50 ug

OVERVIEW

SoNa™ 520 is a new sodium-sensitive fluorescent indicator dye used to detect sodium levels in cells and other biological samples. SoNa™ 520 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.

AT A GLANCE

Protocol Summary

1. Add 50 µL NaCl Standards or test samples
2. Add 50 µL SoNa™ 520 working solution.
3. Incubate at RT for 5-10 minutes
4. Monitor the fluorescence at Ex/Em=490/525 nm

Important

The following protocol is an example for quantifying sodium content using SoNa™ 520. The DMSO stock solution should be handled with particular caution as DMSO is known to facilitate the entry of organic molecules into tissues.

KEY PARAMETERS

Fluorescence microplate reader

Cutoff	515 nm
Emission	525 nm
Excitation	490 nm
Recommended plate	Solid black

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

Prepare SoNa™ 520 stock solution

1. Add DMSO into SoNa™ 520 vial (Component A) to make 2 to 5 mM stock solution.

   Note: Make a single unused SoNa™ 520 stock solution aliquot and store at ≤ -20 ° C. Protect from light and avoid repeated freeze-thaw cycles.

PREPARATION OF STANDARD SOLUTIONS

For convenience, use the Serial Dilution Planner:
https://www.aatbio.com/tools/serial-dilution/21320

NaCl Standard
Prepare NaCl Standard at 250 mM standard stock solution. Next, dilute this 250 mM stock solution using Tris buffer to make a 40 mM (SS1). Then perform 1:2 serial dilutions to get serially diluted NaCl standard (SS2 – SS7).

PREPARATION OF WORKING SOLUTION

Prepare SoNa™ 520 working solution

1. Prepare 10 to 20 µM SoNa™ 520 working solution into 5 mL of Tris Buffer (pH~7.5). Protect the working solution from light by covering it with foil or placing it in the dark.

   Note: For best results, this solution should be used within a few hours of its preparation.

   Note: 5 mL of working solution is enough for 100 tests.

SAMPLE EXPERIMENTAL PROTOCOL

Important

The following protocol only provides a guideline and should be modified according to your specific needs.

Table 1. Layout of NaCl standards and test samples in a solid black 96-well microplate.

SS=NaCl Standards (SS1 - SS7, 40 to 0.625 mM, 2X dilutions); BL=Blank Control; TS=Test Samples

BL	BL	TS	TS
SS1	SS1	...	...
SS2	SS2	...	...
SS3	SS3	...	...
SS4	SS4	...	...
SS5	SS5	...	...

SS6	SS6	...	...
SS7	SS7	...	...

Table 2. Reagent composition for each well.

Well	Volume	Reagent
SS1-SS7	50 µL	Serial dilutions (40 to 0.625 mM)
BL	50 µL	Tris Buffer
TS	50 µL	Sample

Protocol

1. Prepare NaCl standards (SS), blank controls (BL), and test samples (TS) according to the layout provided in Tables 1 and 2. For a 384-well plate, use 25 µL of reagent per well instead of 50 µL.

2. Add 50 µL of SoNa™ 520 working solution to each well of NaCl standards, blank control, and test samples to make the assay volume of 100 µL/well. For a 384-well plate, add 25 µL into each well instead, for a total volume of 50 µL/well.

3. Incubate the reaction at room temperature for 5 to 10 minutes, protected from light.

4. Monitor the fluorescence increase with a fluorescence microplate reader at Ex/Em = 490/525 nm (cut off at 515 nm).

EXAMPLE DATA ANALYSIS AND FIGURES

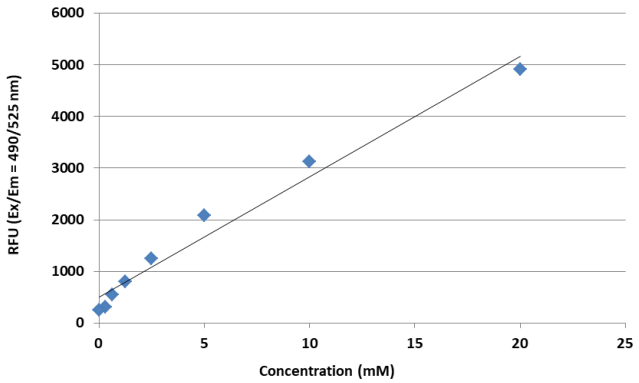

Figure 1. Sodium dose response was measured with SoNa™ 520 in a 96-well solid black plate.

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