

NFP-STEM Sampler Kit

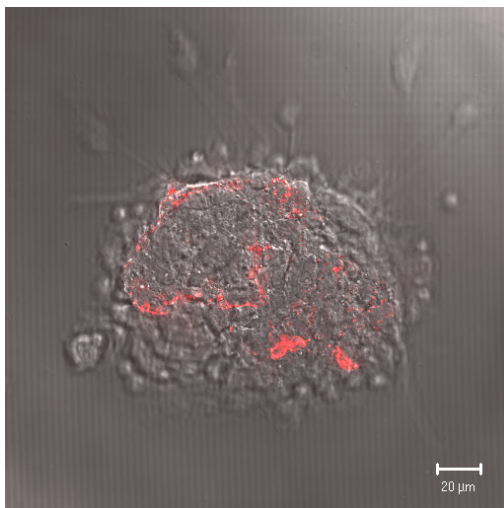
Cat.No	Description	NFP Size	Conc.	Volume
K26210	NFP-STEM Sampler Kit (K2587502, K2583502, K2593502)	50nm	2mg/ml each	0.5ml each

NFP-STEM (Fluorescent Nanoparticle for Stem Cell Research)

NFP (Nano Fluorescent Particle) is a fluorescent nanoparticle providing high fluorescent intensity compared to the common organic fluorescent dyes. NFPs contain FITC or RITC dyes inside of the silica shell structure so the incorporated dyes increase the photochemical stability even after multiple exposures to light and it enables long-term cell imaging studies. Also, a magnetic material (cobalt ferrite) can be inserted into the core of the shell for magnetic properties. NFPs have a water-soluble surface of silica shell for modification with various functional groups so protein conjugations can be performed well.

NFP-STEM Sampler Kit contains 3 different NFPs which contain RITC fluorescence for staining of stem cells. NFPs are easily taken up into stem cells by endocytosis and remain within the cell for several weeks. Cultured stem cells treated with NFP is useful for in vivo tracking of differentiation of the stem cells by observing the target organs or tissues as well as continuous image monitoring of stem cells.

* RITC, orange (Ex/Em)=543/554 nm



Adult stem cell was stained with NFP-RITC (red orange) and the fluorescent signal intensity was observed s time passes.

No toxicity • Photostability • Brightness • Water solubility

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KIT CONTENTS

- NFP-STEM Silanol RITC 50
- NFP-STEM Silanol-PVP RITC 50
- NFP-STEM Silanol Magna RITC 50

PROTOCOL

1. Prepare the stem cell in a culture dish or a flask.
2. Add NFP-STEM in the culture media at a final concentration 0.2mg/ml.
3. Incubate for 8 hours (in case of Adult Stem Cell).

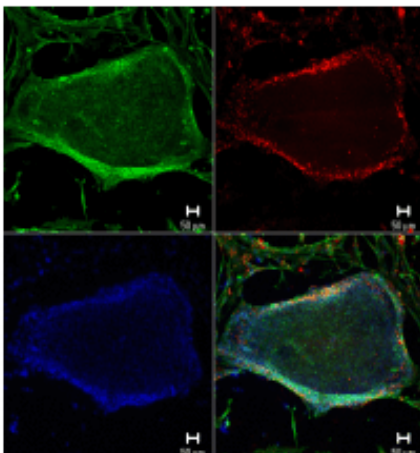
Note: The incubation time or NFP concentrations are changeable depending on the kind of stem cells. For use in Embryonic Stem Cells, the incubation is recommended to be done for longer time.

4. Wash fresh media three times.

APPLICATIONS

(1) Embryonic stem cell staining with NFP-STEM

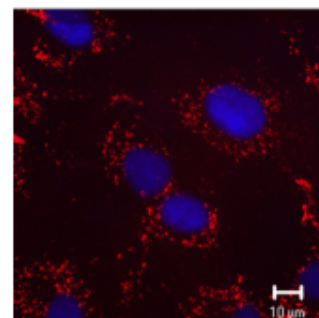
NFP is easily uptaken by stem cells and remains within the cell, so it helps to distinguish stem cells from others as well as continuous image monitoring of stem cells.



The cell was stained with FITC-conjugated Anti-Oct-4 (Green), the NFP-RITC (Red) and DAPI (Blue) respectively. The Oct-4 (Octamer-4), a member of the POU family of transcription factors, has been noted to be expressed in embryonic stem cells. The red fluorescence shows that the NFP was incorporated into the ES cell.

(2) Adult stem cell staining with NFP-STEM

The adult stem cell was stained with the NFP-RITC. The cytoplasm is shown in red by RITC fluorescence of nanoparticles.
Red: NFP-RITC
Blue: DAPI

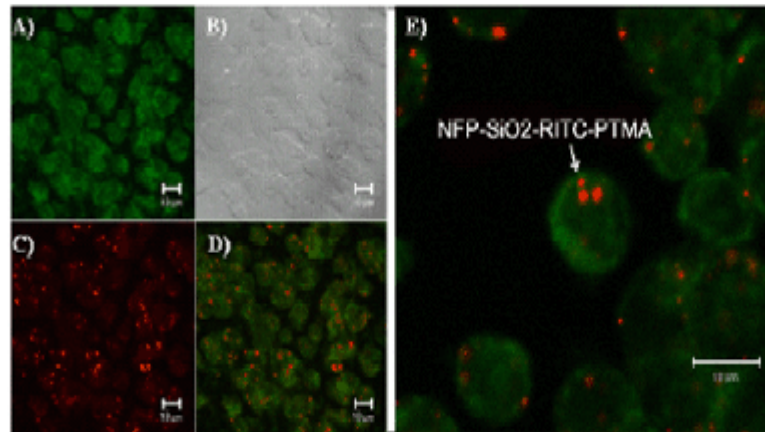
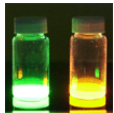


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NFP-BASED ASSAYS

(1) Transfection / Gene or drug delivery carrier

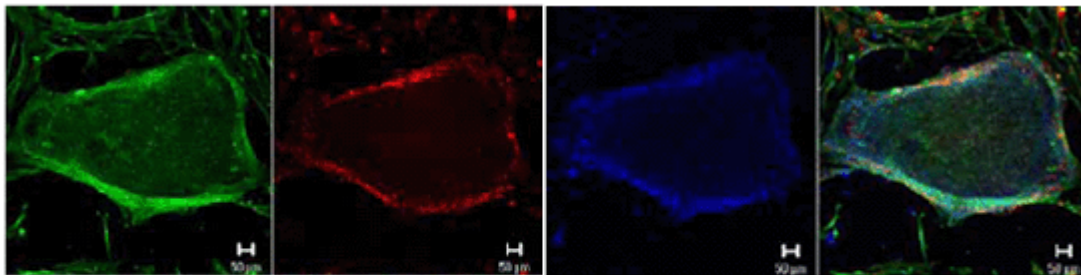
Positive charged nanoparticles are possible to apply as gene or drug delivery carrier. And it can overcome carrier on a commercial scale limitation in safety, and efficiency. A uniform ionic surface of the nanoparticle shows more than 95% transfection efficiency.



CLSM images of A549 cells transfected by the plasmid DNA bound NFP-PTMA-RITC system. Green fluorescence image (A), bright field image (B), red fluorescence image (C), all merged image (D), and high magnification merged image (E). Green fluorescence by GFP expression was shown at all cells and red fluorescence dots were also existed in the cytoplasm of cells.

(2) Stem Cell Staining

NFP is easily uptaken by stem cells and remains within the cell, so it helps to distinguish stem cells from others as well as continuous image monitoring of stem cells.



The cell was stained with FITC-conjugated Anti-Oct4 (Green), NFP-RITC (Red) and DAPI (Blue), respectively. The Oct-4 (Octamer-4), a member of the POU family of transcription factors, has been noted to be expressed in embryonic stem cells. The red fluorescence shows that the NFP was incorporated into the ES cell.

Green: FITC conjugated Anti-Oct4, Red: NFP-RITC, Blue: DAPI staining