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For live cell imaging of nucleus

NucleoSeeing
< Live Nucleus Green >

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NucleoSeeing is a novel live cell imaging probe which emits green fluorescence by binding to DNA specifically.

This product has been commercialized under the license from Nagoya Institute of Technology.

Background

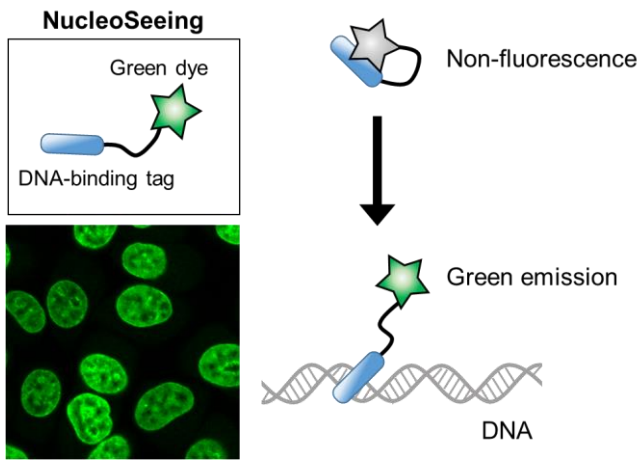
Cell nucleus is one of the most important organelles which stores DNA and chromatin complex in eukaryotic cells and play important roles in various biological functions. To monitor dynamics of cell nucleus in live cells, many cell nucleus specific dyes have been developed . However, such dyes have following problems;

Dyes	Problem
Nucleic acid responsive blue fluorescent dyes (Hoechst, DAPI)	High photo-toxicity. Not optimal for live imaging
General green / red fluorescent dyes of nucleus	Low specificity and cytotoxicity

NucleoSeeing is a newly developed green fluorescent dye, specific for DNA.

DNA-binding tag and green fluorescent dyes are linked by PEG linker. Although NucleoSeeing has two fluorophores, fluorescence of this probe is strongly quenched under non-DNA conditions.

In addition to nucleus specific imaging, NucleoSeeing can be applied for nucleus specific pH sensing.



Features

- No signal under non-DNA binding condition
- High S/N ratio
- Low cytotoxicity
- Compatible with both live and fixed cells
- Compatible with animal and plant cells.
- Reversible
  - Can be washed out by replacing medium
- Can be used as nucleus pH sensor

Application

- Live Cell Imaging
- Counter staining in immunocytochemistry
- Nucleus specific pH sensor

Reference

1. Nakamura *et al., Chem. Commun.*, **50**, 6149-6152 (2014)
2. Ueda *et al., ACS Cent. Sci.*, **3**, 462-472 (2017)
3. Nakamura *et al., Bioorg. Med. Chem. Lett.*, **27**, 3127-3130 (2017)

Data example

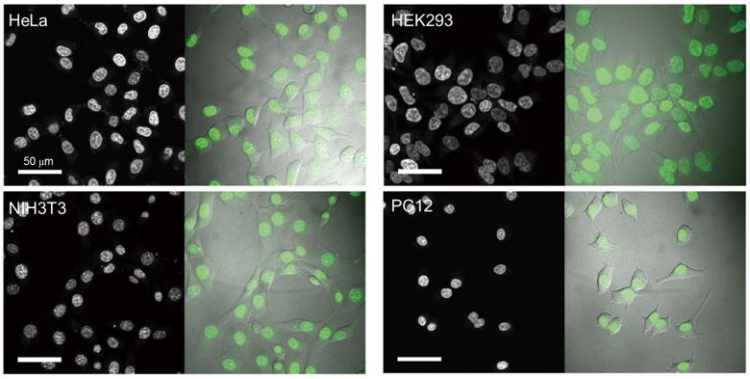


Fig.1 Staining of nucleus in various cultured cells
Four cell lines were treated with 1 μM NucleoSeeing for 15 min and observed under live condition.

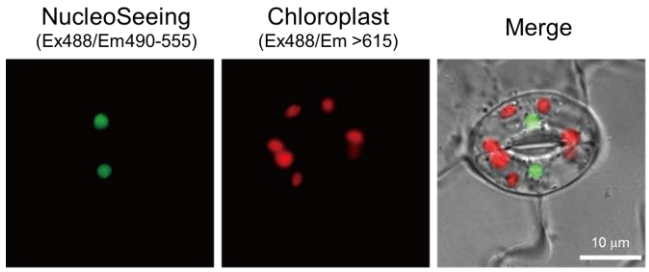


Fig.2 Staining of *Arabidopsis thaliana* Guard cells
Arabidopsis thaliana leaves were treated with 20 μM NucleoSeeing under living condition.
Green signals from NucleoSeeing were clearly separated from plant autofluorescence derived from chloroplast.

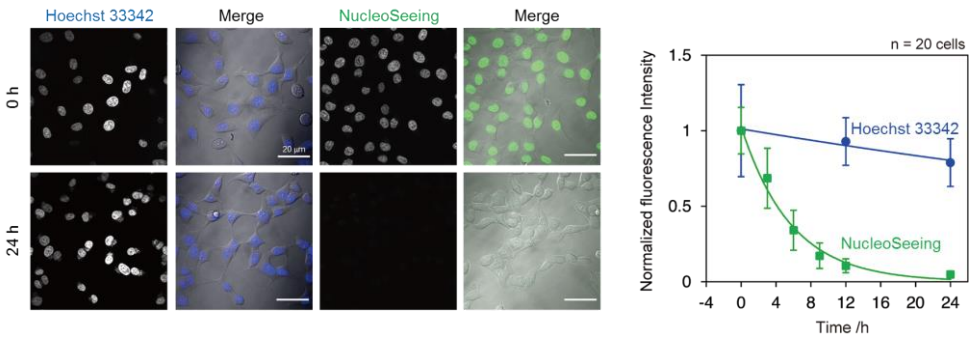


Fig.3 Reversible staining of NucleoSeeing
After HeLa cells were treated 1 μM Hoechst33342 and NucleoSeeing for 15 min, cells were washed by PBS and cultured for 24 hours. While over 80% of blue signal of Hoechst33342 was still remained, green signals of NucleoSeeing were dramatically reduced within 12 hours.

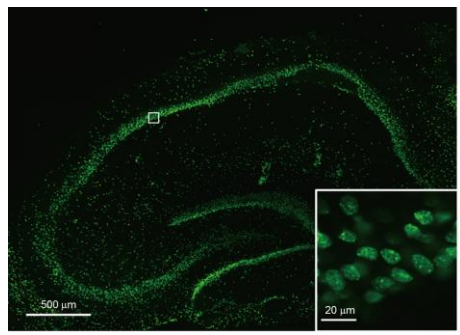


Fig.4 Staining of cultured slice tissue
Cultured mouse hippocampal brain tissue was treated with 20 μM NucleoSeeing for 15 min and observed in non fixed condition.

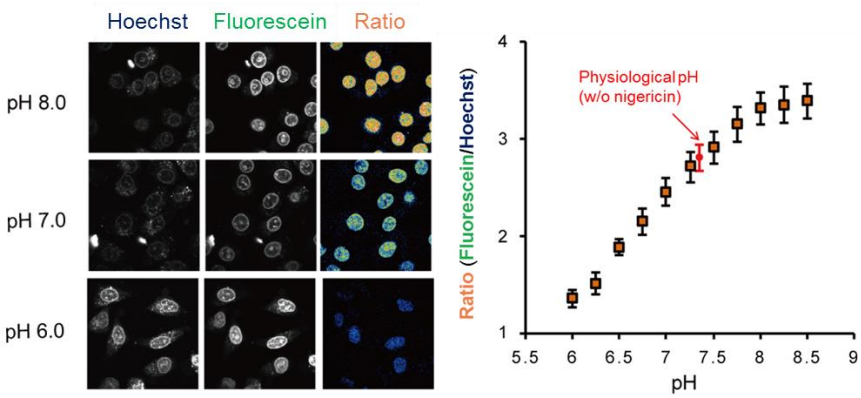


Fig.5 *in cellulo* ratio metric imaging
Cells were incubated with 5 μM NucleoSeeing for 15 min, washed and observed after nigericin (a representative K^+/H^+ ionophore) treatment at the indicated pH or directly as intact cells. Excitation at 405 nm and detection at 430-510 nm as Hoechst filter and 520-620 nm as Fluorescein filter. Fluorescent intensity is changed in pH-dependent manner. Therefore NucleoSeeing can be used as nucleus pH sensor by taking fluorescent intensity ratio of two wavelength.

Product Information

[Manufacturer : FNA]

Product Name	Code	Size	Storage
NucleoSeeing <Live Nucleus Green>	FDV-0029	0.1 mg	-20℃

NOTE
※ All products here are research use only, not for diagnostic use.
※ Specs might be changed for improvement without notice.
※ Numbers after "#" represents product code.
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