NU Tech
Technology Partnership of Nagoya University, Inc.

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Novel Fluorescent Compounds that Distinguish DNA and RNA

Background:

Although several fluorescent dyes to stain nucleic acids are commercially available such as EtBr, SYBR Green, PicoGreen, Thiazole Orange, Hoechst, there are technical problems, such as high energy excitation wavelength (blue wavelength range) damage to live cells, unsuitability for two-photon excitation microscopy, low selectivity of DNA from RNA/DNA mixture, poor cellular permeability, low ratio of fluorescence intensity (only 10-50 fold), And complicated synthesis steps.

Technology Overview:

Nagoya University researchers have succeeded in developing novel fluorescent compounds that allow users to overcome all current fluorescent dye problems above. These novel compounds can be used to stain living cells well (< 500 MW) without any damage using low energy wavelength excitation (561 nm) and they are applicable to the two-photon excitation microscopy assay. More than a 1000-fold increase in fluorescence intensity is seen when the dye binds to DNA, but not when it binds to RNA. Only 4 steps are required to synthesize these compounds.

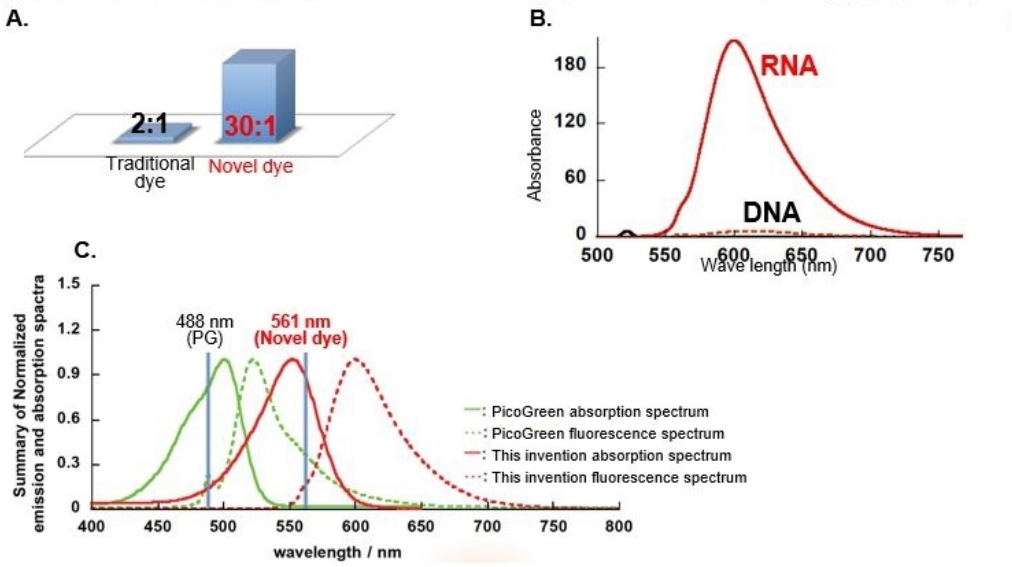

Figure 1: A. Intensity ratio (DNA/RNA). B. Fluorescence spectrum of this novel dye. C. Comparison of fluorescence property between PG and novel fluorescent dye with DNA

Benefits:

Stains live cells without damage due to excitation wavelength
Distinguishes DNA from RNA/DNA mixture

Potential Applications:

Stimulated emission depletion (STED) microscopy
Two-photon excitation microscopy

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