

Fluorescent labels with tunable properties - New Fluorescent Deoxyribosides and their Incorporation into Combinatorial Fluorophore Arrays

Applications

- Creation of hundreds or thousands of fluorescent molecules from a small number of monomers, allowing generation of many selectable types of fluorescence properties.
- Fluorescent labels with tunable properties (desired excitation, emission, brightness).
- Creation of sets of different-color labels with a single excitation.
- Most currently available applications that employ standard labels.
- Obtaining information about distance and geometry in biomolecular systems using interactions between fluorophores (e.g., FRET).
- Use of energy transfer between two fluorophores in sequencing DNA and other genomics methods.

Advantages

- A single excitation can yield widely varied emission wavelengths, simplifying instrumentation needed to use fluorescence in diagnostics applications and experiments. Similar to quantum dots in this respect, but much simpler to conjugate.

- Multiple energy transfer leading to very large Stokes shifts (avoiding background interference in fluorescence).
- Very high localized fluorescence intensity resulting from very high total molar absorptivities.
- Choice of using various types of modified backbones for aqueous or organic solubility.
- Replacement of more traditional reporting methods such as radioactivity because of greater safety and greater utility.

Publications

- Wang S, Guo J, Ono T, Kool ET. [DNA polyfluorophores for real-time multicolor tracking of dynamic biological systems](#). *Angewandte Chemie*. 2012 Jul 16;51(29):7176-80.
- Guo J, Wang S, Dai N, Teo YN, Kool ET. [Multispectral labeling of antibodies with polyfluorophores on a DNA backbone and application in cellular imaging](#). *PNAS*. 2011 Mar 1;108(9):3493-8.
- Teo YN, Wilson JN, Kool ET. [Polyfluorophores on a DNA Backbone: A Multicolor Set of Labels Excited at One Wavelength](#). *J Am Chem Soc*. 2009 Mar 25;131(11):3923-33.
- Gao J, Strassler C, Tahmassebi D, Kool ET. [Libraries of composite polyfluors built from fluorescent deoxyribosides](#). *J Am Chem Soc*. 2002 Oct 2;124(39):11590-1.
- Gao J, Watanabe S, Kool ET. [Modified DNA Analogues That Sense Light Exposure With Color Changes](#). *J. Am. Chem. Soc*. 2004, 126, 12748-12749.
- US patent 7,423,133: [Fluorescent Glycosides and Methods for Their Use](#)

Patents

- Published Application: [20040215012](#)
- Published Application: [WO2004019002](#)
- Issued: [7,423,133 \(USA\)](#)

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