Fluorescent Probes and Labels for Biomedical Applications

Novel, proprietary fluorescent probes and labels of the Seta, Square and SeTau dye series that span the visible and near-infrared range for use in biological, biomedical and pharmaceutical research, clinical diagnostics and high-throughput screening.

These markers are the brightest and most stable dyes currently available on the market and are replacements for the most common dye series such as Alexa or Cy.

These materials include:

- Reactive visible and near-infrared (NIR) fluorescent labels for covalent attachment to biomolecules (proteins, antibodies, amino-acids, peptides, oligonucleotides, DNA, RNA, etc.);
- Fluorescent probes for proteins, lipids, cholesterol, cells, and other large-molecular-weight biological species;
- Fluorescence lifetime (FLT) probes and labels for FLT and polarization based applications;
- pH-sensitive fluorescent probes and labels for micro-environmental sensing applications;
- Fluorescent probes and labels for single molecule applications;
- Reactive dark quenchers for Fluorescence Resonance Energy Transfer (FRET) applications;
- Classification dyes (hydrophobic fluorophores) for single or multiple encoding of microspheres used in High-throughput Screening (HTS).

Innovative aspect and main advantages

Wide spectral range. The new Seta, Square and SeTau dyes absorb and emit in the 350–850 nm spectral range. Unlike other commercially available dyes of the Cy and Alexa series, these red and NIR emitting markers can be excited not only with the red, 635-nm and 670-nm diode lasers but also with the blue, 370-nm or 405-nm lasers or light emitting diodes (LEDs).

Extremely bright. The red and NIR Seta, Square and SeTau dyes have high extinction coefficients (up to 370,000 M\(^{-1}\)cm\(^{-1}\)), quantum yields in water up to 60%, and protein conjugates of these labels are extremely bright (quantum yields up to 70% in aqueous buffer solution).

High stability. As compared to Cy or Alexa dyes Seta, Square and especially SeTau dyes exhibit much higher photostability and stability against oxidizers such as ozone and/or hydrogen peroxide.

Long fluorescence lifetimes. Some of the long-wavelength Seta, Square and SeTau dyes are also tracers for lifetime (FLT) and polarization based assays. The microenvironment-sensitive lifetimes of these dyes are in the range of 500 ps to 3 ns. Dyes with FLT up to 30 ns are also available.

Low blinking. The long-wavelength Seta, Square and SeTau dyes show low blinking effects and therefore are promising in single molecule applications.
**High sensitivity towards the microenvironment.** Selected *Seta* and *Square* probes exhibit high affinity for proteins, biomembranes and lipoproteins and can be used for their detection and quantification.

**pH-sensitivity in physiological range.** Selected *Seta* and *Square* probes and labels display sensitivity in the physiological and acidic pH range and are useful for ratiometric measurements in membranes and cells. These dyes shows potential as pH probes to detect acidic organelles in eukaryotic cells.

**Reactive dark quenchers.** The newly developed reactive, dark quenchers of SQ series that absorb in the 500–800 nm spectral range have several times higher extinction coefficients as Black Hole Quenchers, do not exhibit any residual fluorescence and are perfectly suited for covalent labeling of proteins, peptides and oligonucleotides for use in FRET and real-time PCR based applications.

More detailed technical information can be found at
http://www.isc.kharkov.com/old
http://www.setabiomedicals.com

### Areas of Application

*Seta, Square* and *SeTau* dyes are utilized in fluorescent applications using intensity, polarization, Fluorescence Resonance Energy Transfer (FRET), or Fluorescence Lifetime (FLT) as a read-out parameter. Our fluorescent products are invaluable tools for applications in life sciences (**biology**, **medicine** and **pharmacology**).

**More specific areas include:**

- Biological Imaging
- Cytology
- Immunology
- Drug Screening
- Cellular and Molecular Biology
- Proteomics
- Genomics
- High-throughput Screening
- Single Molecule Applications
- Photodynamic Therapy
- Clinical Diagnostics

### Contact details

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