



Dyes for Advanced Fluorescence Lifetime Flow Cytometry (FLFC) Applications

Highly bright and stable fluorochromes with analyte-sensitive and insensitive lifetimes from ps to tens of ns

SETA BioMedicals has developed several proprietary fluorescent dyes, tandems, and labels (fluorochromes) optimized to enable robust, fluorescence lifetime (FLT)-based, single- and multiple-cell analyses with **Single Cell Fluorescence Lifetime Flow Cytometry (SCFL-FC)** or **High-Throughput Fluorescence Lifetime Imaging Flow Cytometry (HTFLIM-FC)** [1]. These FLT-based reporters span the entire optical spectrum from the UV to the near-IR with **luminescent lifetimes** ranging from **ps** to **tens of ns** and are compatible with the commercial Danube Fluorescence Lifetime Flow Cytometer (Kinetic River Corp., USA) [2], the Swabian Instrument FLFC [3], and other non-commercial FLT and FLIM FCs.

Excitation laser line [nm]	Fluorochrome (Free dye) / Ab conjugate†	Environment sensitive FLT	λ_{max} Ab [nm]	λ_{max} FI [nm]	Brightness at the excitation laser line [$\text{M}^{-1}\text{cm}^{-1}$]	FLT‡ [ns]
380	Seta-375 / IgG (D/P = 5)	No	372 / 372	476 / 480	20,500 / 50,000	3.2 / 3.5
	SeTau-380 / BSA	No	381 / 383	480 / 468	900 / 3,000	32.5 / 30.6
405	SeTau-405 / IgG (D/P = 2)	No	405 / 405	518 / 518	11,000 / 6,900	9.3 / 8.9
436	SeTau-425 / BSA (D/P = 2)	n.d.*	425 / 427	545 / 532	1,500 / 1,000	26.2 / n.d.*
	Seta-470 / Glycerol:Water 10 cP, +65 °C / 700 cP, -6 °C	Yes, Viscosity	460 / 460 / 460	521 / 525 / 525	560 / n.d.* / n.d.*	0.21 / 1.7 / 17.3
488	SeTau-488 / IgG (D/P = 2)	Yes	486 / 484	532 / 530	22,800 / 71,600	1.2 / 2.3
	SeTau-500 / IgG (D/P = 2)	Yes	502 / 500	568 / 563	31,200 / 53,100	1.7 / 2.6
	Seta-470 / Glycerol:Water 10 cP, +65 °C / 700 cP, -6 °C	Yes, Viscosity	460 / 460 / 460	521 / 525 / 525	560 / n.d.* / n.d.*	0.21 / 1.7 / 17.3
532	Seta-555 / IgG (D/P = 2)	No	555 / 556	570 / 571	3,400 / n.d.*	0.2 / n.d.*
594	Seta-633 / IgG (D/P = 2)	Yes	633 / 637	644 / 647	3,600 / 23,700	0.25 / 1.49
	Seta-640 / IgG (D/P = 2)	Yes	636 / 640	646 / 650	4,600 / 19,900	0.7 / 1.2
635	Seta-650 / IgG (D/P = 2)	No	651 / 654	671 / 673	35,100 / 80,200	1.0 / n.d.*
	Seta-660 / IgG (D/P = 2)	n.d.*	661 / 665	672 / 675	4,900 / 38,900	1.5 / n.d.*
	SeTau-647 / IgG (D/P = 2)	No	649 / 648	695 / 694	74,000 / 128,600	3.2 / 3.1
650	Seta-650 / IgG (D/P = 2)	No	651 / 654	671 / 673	56,000 / 128,4000	1.0 / n.d.*
	Seta-660 / IgG (D/P = 2)	n.d.*	661 / 665	672 / 675	10,700 / 83,800	1.5 / n.d.*
	SeTau-665 / IgG (D/P = 2)	No	664 / 662	712 / 716	47,900 / 54,200	3.1 / n.d.*
	SeTau-670 / IgG (D/P = 4)	No	673 / 672	694 / 693	39,600 / 61,600	1.62 / 1.75
	Square-650-pH at pH 5.6 / pH 9.0	Yes, pH [§]	653 / 535	671 / 663	20,900 / 260 (3,600 at $\lambda^* = 532$ nm)	1.2 / 0.5
	Square-660 / Oligonucleotides	Yes	657 / 676	676 / 695	n.d.* / n.d.*	0.27 / 2.73
680	Seta-680 / IgG (D/P = 2)	No	678 / 680	698 / 701	47,500 / 103,000	1.0 / n.d.*
	SeTau-680 / IgG (D/P = 2)	No	683 / 682	705 / 703	122,300 / 244,600	2.91
	Seta-670 / IgG (D/P = 5) / BSA (D/P = 1.5)	Yes	667 / 670 / 681	688 / 693 / 696	8,200 / 11,700 / 47,300	0.42 / 0.85 / 2.43
700	Zy7	No	749	774	8,400	0.57
750	Seta-750 / IgG (D/P = 2)	No	753/756	780 / 783	31,600 / 68,700	0.6 / n.d.*
780	Seta-780	No	777	807	2,600	0.6

† Fluorochrome conjugated to antibody (protein). D/P is dye-to-protein ratio

‡ Acquired with ISS Chronos FD at 25 °C

* Not determined

§ pH-sensitive dye, excitable at 650 nm under acidic pH and at 532 nm at basic pH, emitting at 660–670 nm under all conditions [4].

References

[1] *Nat Commun* **15**, 7376 (2024).

[2] <https://www.kineticriver.com/wp-content/uploads/2022/05/KRC-Danube-Data-Sheet.pdf>

[3] <https://www.swabianinstruments.com/applications/fluorescence-lifetime-flow-cytometry/>

[4] *Analytical Biochemistry*, 2009, V390, 136-140.

Contact us about these and other products or if you are interested in obtaining a sample for testing