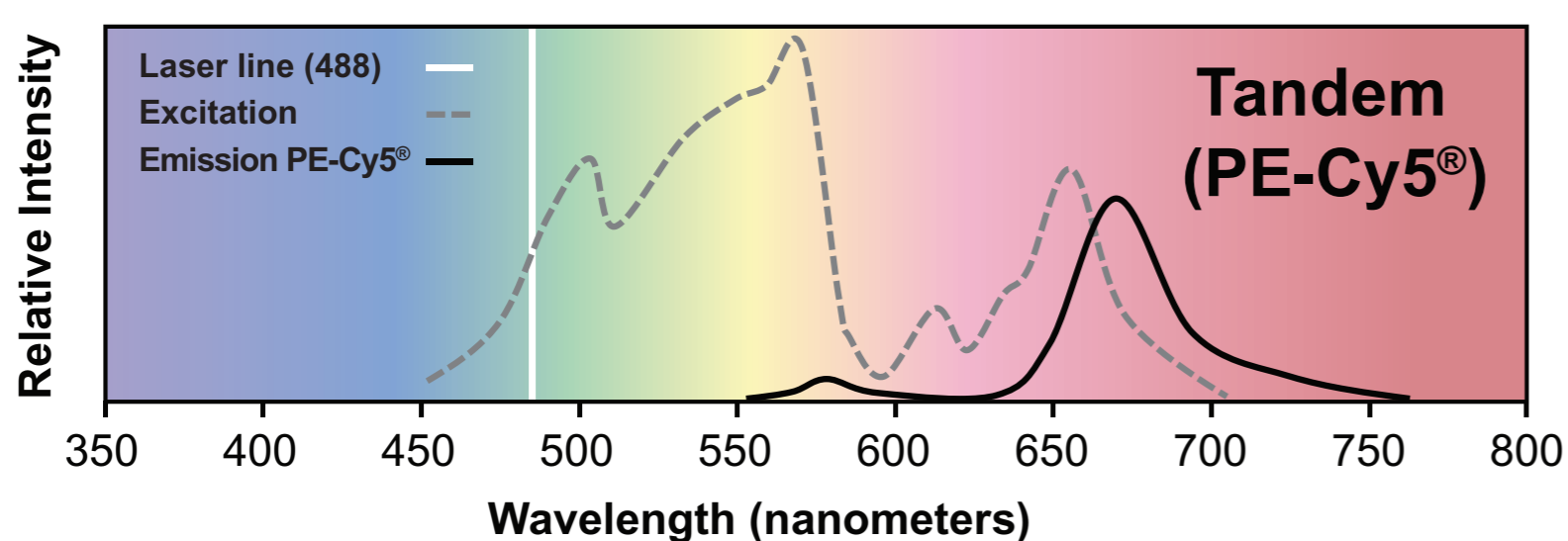
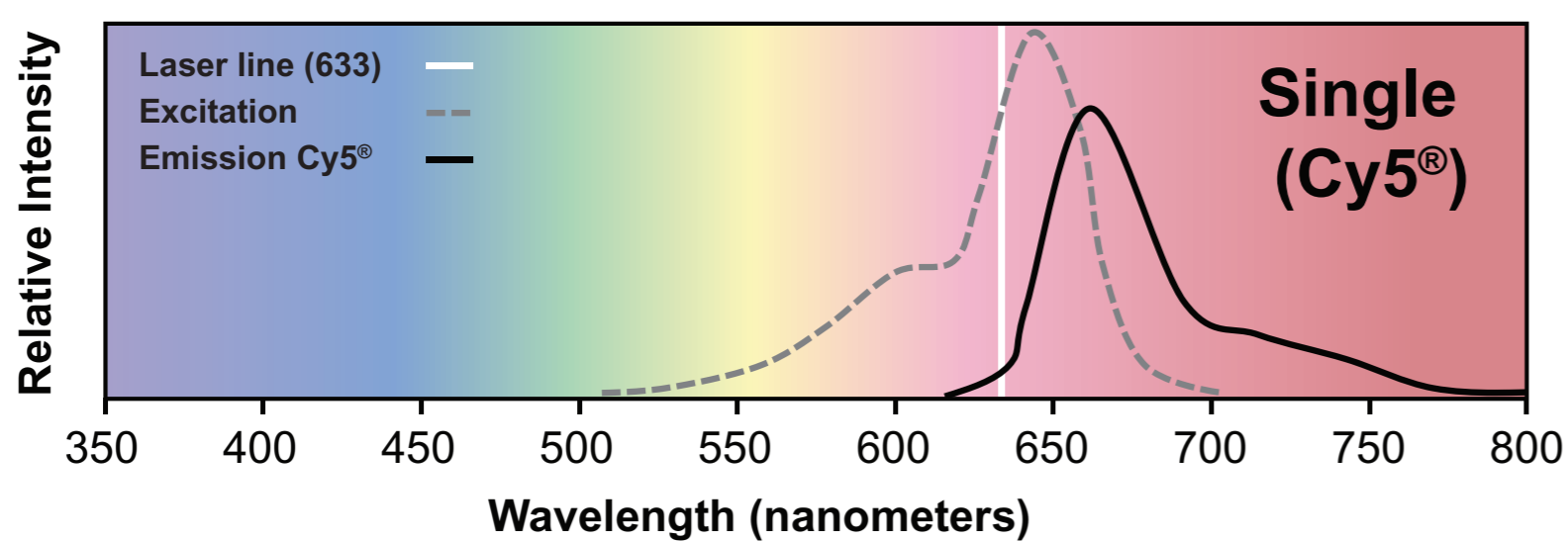
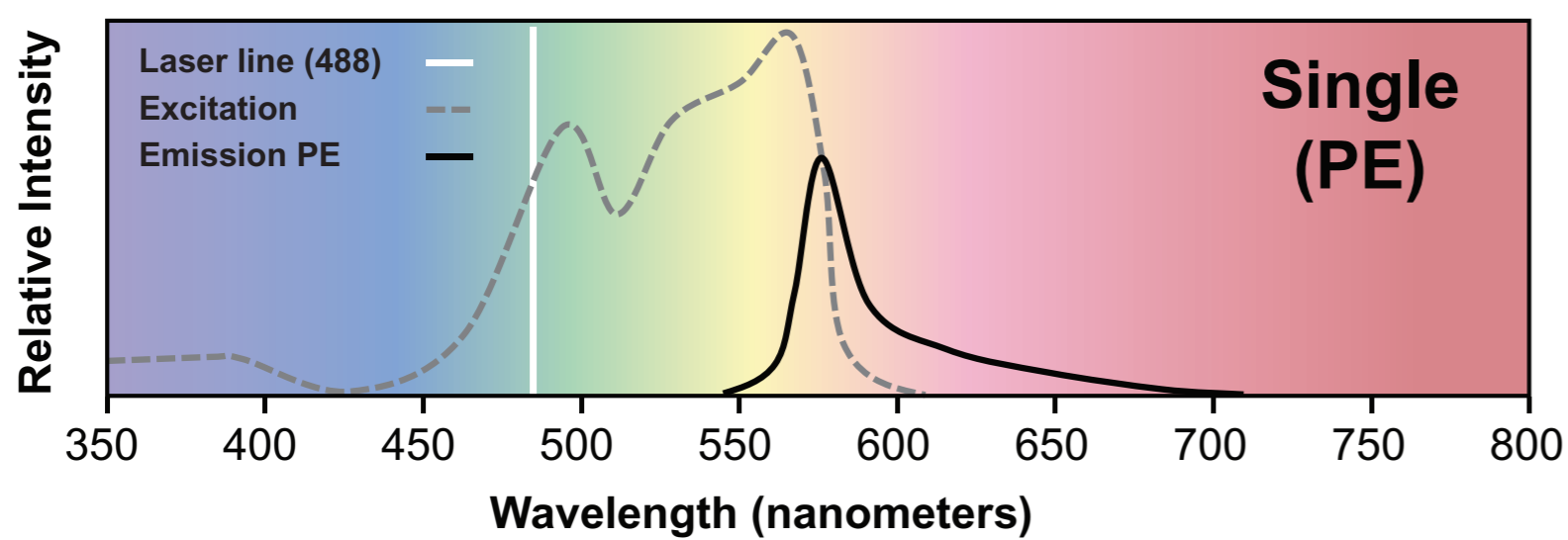


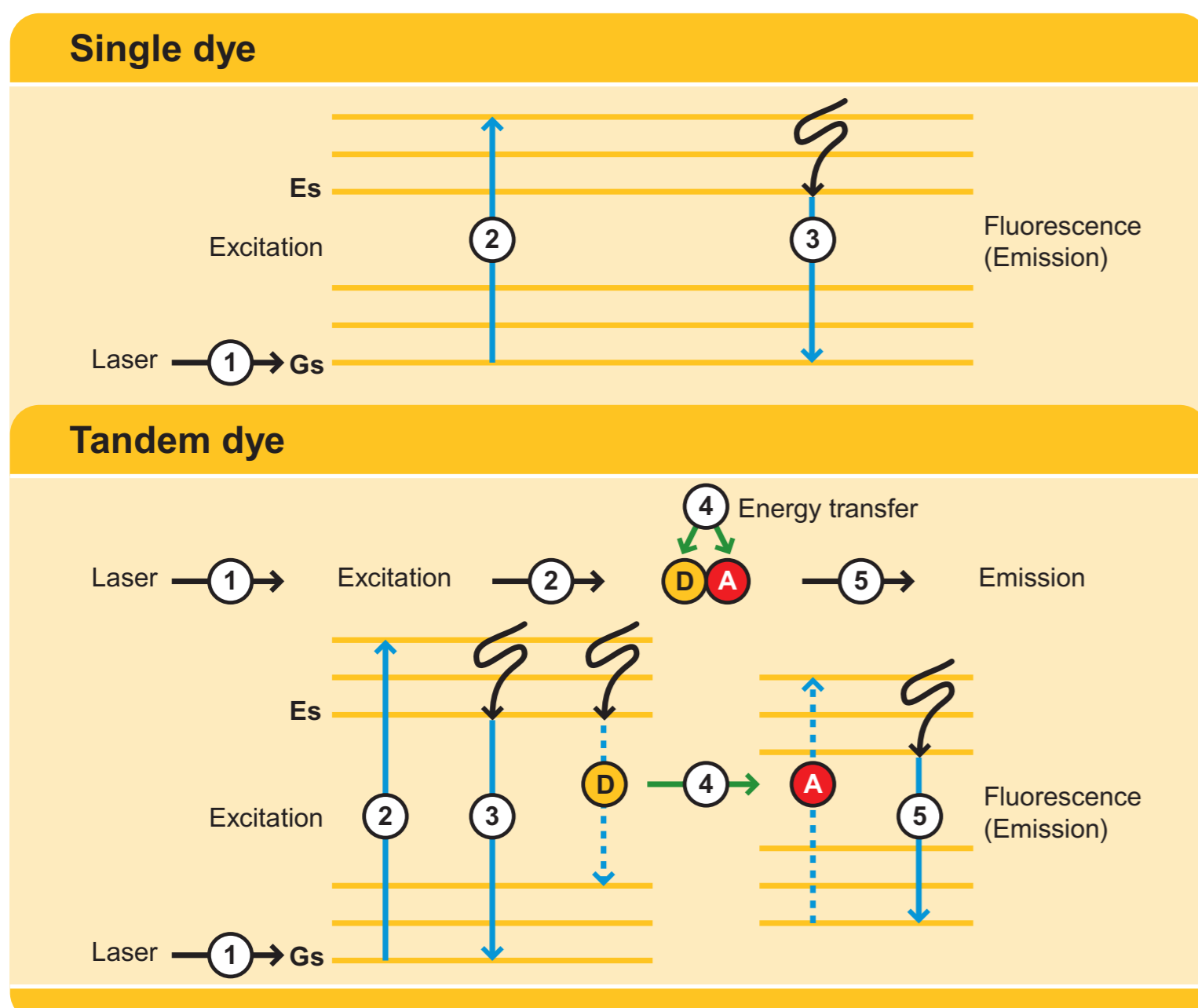
# A Guide to Fluorochromes

## Excitation and Emission Spectral Profiles



Due to their novel electronic configurations, fluorochromes have unique and characteristic spectra for absorption (excitation) and emission. A single dye is excited at a particular wavelength and emits a photon at another wavelength. A tandem dye consists of a donor and acceptor fluorochrome molecule, placed in close proximity, allowing for energy transfer between the two. The tandem dye is excited at the excitation wavelength of the donor molecule and emits a photon at the emission wavelength of the acceptor molecule.

## Energy Level Diagrams



For a **single fluorescent dye**, a laser set at the signature excitation wavelength for the dye provides electromagnetic energy to an electron in that molecule (1). The electron moves to an excitation state at the next energy level (Es) (2). Energy is then released in the form of a photon (fluorescence) and the electron moves back down to the lower energy level (Gs) (3). In the case of a **tandem fluorescent dye**, after excitation of the electron by a laser (1)-(2), energy is released by an electron in the donor molecule (D) and absorbed by an electron in the acceptor molecule (A) (4). The electron in the acceptor molecule moves to an excitation state at the next energy level (Es). Similar to a single dye, energy is then released in the form of the photon (fluorescence) and the electron moves back down to the lower energy level (Gs) (5).

| Dye  | Excitation wavelength | Emission wavelength | Excitation laser lines (nm) | Fluorescence Channel |
|--|-----------------------|---------------------|-----------------------------|----------------------|
| Methoxycoumarin                              | 360                   | 410                 |                             |                      |
| DyLight® 405                                 | 400                   | 420                 |                             |                      |
| HiLyte Fluor™ 405                            | 404                   | 428                 |                             |                      |
| DyLight® 350                                 | 353                   | 432                 |                             |                      |
| Aminocoumarin                                | 350                   | 445                 |                             |                      |
| Pacific blue™                                | 404                   | 456                 | 360,405,407                 | FL1,FL6              |
| EviTag™ quantum dots-Lake Placid Blue        | 470                   | 490                 |                             |                      |
| Cy2®   | 489                   | 506                 | 488                         |                      |
| Chromo™ 488                                  | 488                   | 517                 |                             |                      |
| DyLight® 488                                 | 493                   | 518                 |                             |                      |
| Alexa Fluor® 488                             | 495                   | 519                 | 488                         | FL1,FL3,PM3          |
| FAM  | 494                   | 519                 |                             |                      |
| Fluorescein Iso-thiocyanate (FITC)           | 495                   | 519                 | 488                         | FL1,FL3,PM3          |
| EviTag™ quantum dots-Adirondack Green        | 505                   | 520                 |                             |                      |
| Chromo™ 505                                  | 505                   | 526                 |                             |                      |
| HiLyte Fluor™ 488                            | 501                   | 527                 |                             |                      |
| EviTag™ quantum dots-Catskill Green          | 525                   | 540                 |                             |                      |
| Alexa Fluor® 430                             | 434                   | 541                 |                             |                      |
| Alexa Fluor® 532                             | 532                   | 554                 |                             |                      |
| HEX  | 535                   | 556                 |                             |                      |
| EviTag™ quantum dots-Hops Yellow             | 545                   | 560                 |                             |                      |
| Chromo™ 546                                  | 545                   | 561                 |                             |                      |
| Cy3®   | 548                   | 561                 | 488,514                     | FL2,FL4,PM1          |
| Alexa Fluor® 555                             | 555                   | 565                 |                             |                      |
| HiLyte Fluor™ 555                            | 550                   | 566                 |                             |                      |
| 5-TAMRA                                      | 541                   | 568                 |                             |                      |
| Alexa Fluor® 546                             | 556                   | 573                 |                             |                      |
| DyLight® 549                                 | 562                   | 576                 |                             |                      |
| Phycoerythrin (PE)                           | 496,566               | 576                 | 488                         | FL2,FL4,PM1          |
| Tetramethyl Rhodamine Isothiocyanate (TRITC) | 557                   | 576                 |                             |                      |
| EviTag™ quantum dots-Birch Yellow            | 560                   | 580                 |                             |                      |
| Cy3.5®                                       | 576                   | 589                 | 568,543                     |                      |
| Rhodamine Red-X                              | 570                   | 590                 |                             |                      |
| PE-Dyomics® 590                              | 488                   | 599                 |                             |                      |
| EviTag™ quantum dots-Fort Orange             | 585                   | 600                 |                             |                      |
| ROX  | 575                   | 602                 |                             |                      |
| Alexa Fluor® 568                             | 578                   | 603                 |                             |                      |
| Red 613                                      | 480,565               | 613                 |                             |                      |
| Texas Red®                                   | 595                   | 613                 | 568,543,514                 |                      |
| HiLyte Fluor™ 594                            | 593                   | 616                 |                             |                      |
| PE-Texas Red®                                | 566                   | 616                 |                             |                      |
| Alexa Fluor® 594                             | 590                   | 617                 |                             |                      |
| DyLight® 594                                 | 593                   | 618                 |                             |                      |
| EviTag™ quantum dots-Maple-Red Orange        | 600                   | 620                 |                             |                      |
| Chromo™ 494                                  | 494                   | 628                 |                             |                      |
| Alexa Fluor® 633                             | 632                   | 647                 |                             |                      |
| SureLight® APC                               | 652                   | 657                 |                             |                      |
| DyLight® 633                                 | 638                   | 658                 |                             |                      |
| Allophycocyanin (APC)                        | 650                   | 660                 | 595,633,635,647             | FL4,FL7,FL8          |
| Chromo™ 642                                  | 642                   | 660                 |                             |                      |
| Quantum Red                                  | 488                   | 660                 |                             |                      |
| SureLight® P3                                | 614                   | 662                 |                             |                      |
| Alexa Fluor® 647                             | 650                   | 665                 | 595,633,635,647             | FL4,FL7,FL8          |
| Cy5®   | 647                   | 665                 | 633,635                     | FL4,FL8              |
| PE-Cy5®                                      | 565                   | 666                 | 488                         | FL3,FL4,FL6,PM2      |
| SureLight® P1                                | 545                   | 666                 |                             |                      |
| PE-Alexa Fluor® 647                          | 567                   | 669                 |                             |                      |
| PE-Dyomics® 647                              | 488                   | 672                 |                             |                      |
| DyLight® 649                                 | 654                   | 673                 |                             |                      |
| HiLyte Fluor™ 647                            | 650                   | 675                 |                             |                      |
| Peridinin Chlorophyll (PerCP)                | 477                   | 678                 | 488                         | FL3,FL4,FL6,PM2      |
| IRDye® 700DX                                 | 680                   | 687                 |                             |                      |
| Alexa Fluor® 660                             | 663                   | 690                 |                             |                      |
| PE-Cy5.5®                                    | 565                   | 693                 | 488                         | FL3,FL4,FL6,PM2      |
| APC-Cy5.5®                                   | 650                   | 694                 | 595,633,635,647             | FL3,FL4,FL7          |
| Cy5.5®                                       | 675                   | 694                 | 647                         |                      |
| TruRed                                       | 490,675               | 695                 |                             |                      |
| HiLyte Fluor™ 680                            | 678                   | 699                 |                             |                      |
| Alexa Fluor® 680                             | 679                   | 702                 |                             |                      |
| DyLight® 680                                 | 692                   | 712                 |                             |                      |
| APC-Cy7®                                     | 650                   | 774                 | 595,633,635,647             | FL5,FL8,FL9          |
| Cy7®   | 753                   | 775                 |                             |                      |
| PE-Dyomics® 747                              | 488                   | 776                 |                             |                      |
| DyLight® 750                                 | 752                   | 778                 |                             |                      |
| HiLyte Fluor™ 750                            | 753                   | 778                 |                             |                      |
| PE-Cy7®                                      | 566                   | 778                 | 488                         | FL3,FL5,PM4          |
| IRDye® 800RS                                 | 770                   | 786                 |                             |                      |
| DyLight® 800                                 | 777                   | 794                 |                             |                      |
| IRDye® 800CW                                 | 778                   | 794                 |                             |                      |

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| Nucleic Acid Dyes     | Excitation wavelength | Emission wavelength | Excitation laser lines (nm) | Fluorescence Channel |
|-----------------------|-----------------------|---------------------|-----------------------------|----------------------|
| DAPI                  | 359                   | 461                 | 325,360,405,407             | FL1,FL6              |
| Hoechst 33258         | 352                   | 461                 |                             |                      |
| Hoechst 33342         | 350                   | 461                 |                             |                      |
| SYTOX Blue            | 431                   | 480                 |                             |                      |
| YOYO-1                | 491                   | 509                 |                             |                      |
| SYTOX Green           | 504                   | 523                 |                             |                      |
| TOTO-1, TO-PRO-1      | 509                   | 533                 |                             |                      |
| Mithramycin           | 450                   | 570                 |                             |                      |
| SYTOX Orange          | 547                   | 570                 |                             |                      |
| Chromomycin A3        | 445                   | 575                 |                             |                      |
| Ethidium Bromide      | 493                   | 620                 |                             |                      |
| Propidium iodide (PI) | 305,540               | 620                 | 325,360,488                 | FL3,FL4,PM1          |
| DRAQ5™                | 647                   | 681,697             |                             |                      |