Functional stains that can be excited at 488 nm and are detectable in basic instruments with three or four fluorescence channels[1].

| Channel[2] | Fluorochrome[3] | Use | Excitation (nm) | Emission (nm) |
|---|---|---|---|---|
| **FL1** | Acridine orange | DNA | 500 | **526** |
| | | RNA | 460 | **650** |
| | BCECF | Membrane integrity; pH (load as AM ester) | ~505 | **525:640** |
| | Calcein | Membrane integrity (load as AM ester) | 494 | **517** |
| | Carboxyfluorescein diacetate | Membrane integrity (load as AM ester) | 511 | **534** |
| | 2′,7′-dichlorofluorescein diacetate | Metabolic burst, oxidative metabolism | 510 | **532** |
| | $DiBAC_4(3)$ | Trans-membrane potential | 493 | **516** |
| | $DiOC_6$ (3) | Trans-membrane potential | 484 | **501** |
| | Fluorescein diacetate | Membrane integrity (load as AM ester) | 475 | **530** |
| | JC-1 | Mitochondrial trans-membrane potential | 485-585 | **590**[5] |
| | PicoGreen[6] | Highly selective for DNA | 502 | **523** |
| | Rhodamine 123 | Mitochondrial trans-membrane potential | 507 | **529** |
| | SYBR® Green I[6] | High sensitivity DNA stain | 494 | **521** |
| | SYTOX® Green | Cell impermeant nucleic acid | 504 | **523** |
| | Thiazole orange | Nucleic acid | 453,510 | **480,** |
| | TOTO®-1 | High affinity DNA stain | 514 | **533** |
| | YOYO®-1 | High affinity DNA stain | 491 | **509** |
| **FL2** | Dihydroethidium (Hydroethidine™)[4] | Metabolic burst, oxidative metabolism | 518 | **605** |
| | Ethidium bromide | Cell impermeant nucleic acid stain; apoptosis | 518 | **610** |
| | Ethidium monoazide | Fluorescent photoaffinity nucleic acid label compatible with fixation | 464 | **625** |
| | Fluo-3, Fluo-4, Fluo-5 | Calcium (load as AM ester) | 464 | **526** |
| | Propidium iodide | Cell impermeant nucleic acid stain; viability | 520 | **610** |
| | SNARF-1 | Intracellular pH (load as AM ester) | 488-530 | **580:640** |
| **FL3** | 7-AAD | Generally cell impermeant nucleic acid stain | 546 | **647** |
| | Fura Red™ | Calcium (load as AM ester; fluorescence decreases on binding) | 450-500 | **~660** |
| **FL4** | LDS-751 | Nuclear DNA | 543 | **712** |
| | DRAQ5 | Nuclear DNA | | **Deep red** |

[1]Where there are only three fluorescence detectors, FL3 will normally detect fluorochromes emitting in the red and the long red wavelengths. [2] Filters as described in Table 3.1. [3]7-AAD = 7-aminoactinomycin D; AM = acetoxy methyl; BCECF = 2′,7′-bis(2-carboxyethyl)-5,6-carboxyfluorescein; $DiBAC_4(3)$ = bis-(1,3-

dibutylbarbituric acid) trimethine oxonol; $DiOC_6$ (3) = 3,3′-dihexyloxacarbocyanine iodide; SNARF-1 = a seminaphthorhoda-fluor dye. [4]After oxidation to ethidium. [5]As aggregates. [6]Originally used in solution assays but have been used in flow cytometry.

The newer instruments have more lasers that are able to excite more fluorochomes