INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

MATERIALS MANAGEMENT DIVISION

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Technical Specifications for Multimode Microplate Reader

Multimode microplate reader for measurement of Fluorescence, Fluorescence Polarization and UV-Vis absorbance, Luminescence.

General Specifications:

Following Detection Modes & features should be included:

- Fluorescence Intensity & FRET
- UV/Vis Absorbance with Spectral Scanning
- Fluorescence Polarization / Anisotropy
- Luminescence
- Western Blot Detection (Either inbuilt capability with suitable membrane holder or a dedicated Western Blot system should be quoted)

- System should have capability to use true hybrid optics (monochromator and filters) for Fluorescence with EX/EM as mono-mono, mono-filter, filter-mono, filter-filter.
- System should perform Top and bottom reading for fluorescence. Spectral Scanning and Kinetic Reading, Endpoint reading for Absorbance, Fluorescence, Luminescence, and Fluorescence polarization.
- System should offer ability to read 6 to 384 well plates.
- System should have automatic Pathlength correction feature, independent of temperature, which can automatically normalize well absorbance equal to 1cm pathlength for spectrophotometric data.
- System should offer programmable linear, orbital, and double orbital microplate shaking methods
- System should offer temperature control in the microplate chamber from 5°C above ambient to 66 °C.
- System should offer read times less than 35 sec for all 5 modes – Abs, FI, Lum, TRF, FP for 96 well plate.

- System should offer Focal Height Adjustment, Automated focal height adjustment for optimal position of detector
- System should have both Monochromator & Filter modules allowing user to choose either Monochromators and/or Filters vice versa in any combination for excitation & emission

Absorbance Measurement Mode:

- Wavelength range 230 – 1000nm
- Wavelength Selection Spectrometer based/Monochromator based, 1nm increment
- Detector CCD Array / Photodiode
- Accuracy: ±2nm across wavelength range
- Dynamic Range: 0 - 4 OD
- Bandwidth: 4nm across complete spectral range

Fluorescence Intensity, FRET & Anisotropy Measurement Mode:

- Light Source High energy xenon flash lamp
- Detector Low noise Photomultiplier Tube (PMT)
- Wavelength range 250-830nm (EX)& 270-850nm(EM), monochromators, 1.0 nm increment
- Wavelength Selection LVF Monochromator / Quad Monochromator based
- Bandwidth User selectable in the range 8 – 50nm
- Spectral Scanning Fluorescence Excitation / Emission Spectral Scanning
- Sensitivity Top: < 0.5pM fluorescence, 96 &384 well plate
  Bottom: < 1.0 pM fluorescence, 96 &384 well plate
- FP Filters to be included 1. Fluorescein, Alexa488, R 110 (Ex 482-16 & Em 530-40)
  2. Coumarin (Ex405 &Em 460)
  3. UV-FP Filter set & UV Polarizer for Tryptophan assay (Ex 295-10 & Em 360-20)

Luminescence Measurement Mode:

- Detector Low noise Photomultiplier Tubes/ultra-cooled PMT (upto-5degC)
- Wavelength range 300-850nm (for Monochromator) & 240 – 740nm for filters
- Spectral Scanning Luminescence Emission Spectral Scanning should be possible
- Dynamic range 7 decades
- Detection limit 20amol ATP
- License free Multi-user software package, Minimum 4 user license keys, 160+pre-written protocols , Customizable, Protocol sharing community ,Extensive Data Analysis Features 3D data visualization, 21 Curve Fit options, Custom formula writing,

Customizable protocol editing Easy Import/Export, Import data to other lab equipment.

- Export to Excel, text, or XML file, save as PDF, Auto Data Recovery.
- The system should have inbuilt high-resolution touchscreen interface with embedded touch software allowing to set up custom protocols, take advantage of preloaded protocols, and experiment without the need for a dedicated computer workstation.
- Compatible PC should be provided with minimum i5 processor, 8 GB RAM, 1 TB HDD, Windows 10 OS.
- Warranty should be one year from the date of installation.

System should be upgradable to:

- Dual Injectors for Absorbance, Fluorescence and Luminescence
- TRF, TR-FRET, HTRF, BRET
- Low volume (2ul) DNA/RNA measurements using additional adapter
- Bottom read luminescence