SPECIFICATION FOR RESEARCH-GRADE FLUORESCENCE MICROSCOPE FACILITY

1. Upright Fluorescence Microscope		
Magnification	:	40x-1000x for observation.
Optical system	:	Infinity-corrected optical system or better capable of high intensity and uniform co-illumination and has minimal chromatic aberrations.
Configuration	:	Sturdy microscope body, along with suitable condenser, with which a Linkam CSS450 or equivalent stage can be mounted.
Observation Modes	:	BF, DIC, Phase Contrast and Fluorescence.
Eyepiece tube	:	Trinocular Eyepiece tube, F.O.V. 22 mm or more. Should be anti-fungus type. Should have port to mount the camera onto the microscope. The eyepiece tube should have a 2-way with 100:0, 0:100, or 3-way light distribution path (100:0; 80:20; 0:100).
Eyepiece lens	:	10x (2pcs) with both sides diopter adjustment (FN22 mm) or better
Objective	:	High-performance chromatic aberration-free objectives suitable for **bright field microscope, Phase Contrast, Fluorescence, DIC,** with cover glass correction wherever needed**.** The supplier may suggest suitable combinations which at least fulfill the requirements listed here These objectives are desired to be common between this upright fluorescence microscope and the inverted fluorescence microscope (point 3). The objectives should be • Plan achromat objective 4X or 5X/0.1, WD 10mm or better • Plan semi-apochromat objective 20X Phase/0.45 or better, WD 6.9 mm or better with the option of DIC Immersion Oil Bottle (30cc) Adapter to Mount Linkam Heating Stage CSS450
Optional Objectives	:	• Plan Semi-Apochromat objective 10X/0.25 or better, WD 7.5 mm of better • Plan semi-apochromat objective 40X Phase /0.6 or better, WD 0.51 (spring) or better • Plan Semi Apochromat 100X1.3 NA or better (Oil, Spring loaded) or better • Plan semi-apochromat objective 40X Phase /0.6 or better, WD 0.51 (spring) or better with DIC

		• Plan Apochromat 100X1.3 NA or better (DIC) (Oil, Spring loaded) or better
Nose piece	:	Non-motorized, with at least sextuple port revolving nosepiece, with a slot for analyzer / DIC prism should be provided
Condenser	:	Universal Condenser for BF, Phase & DIC
Polarizer	:	Rotatable polarizer and analyzer
Coarse/fine focusing	:	Coarse and fine focusing adjustable
Stage	:	Ceramic coated XY stage with two slide holder capacity
Illumination	:	High performance high color reproductivity 10W or higher LED light source equivalent to 12V – 100W Halogen, Lifetime of minimum 50,000 Hours
LED Fluorescence attachment	:	Six or more Position Fluorescence Turret with Filters for DAPI, FITC, TRITC, CY5 with life more than 10000 hrs
Imaging Software	:	Fully compatible for Bright field, Phase Contrast as well as immunofluorescence imaging and analysis. Overlay multiple images, and document groups for side-by-side image comparison. Touch count/Object Count Facility to count objects, and export to excel files or workbooks. Fl. Channel Merging and extraction. Time-lapse imaging at specified intervals, Manual Multiple image alignment, based on live image, Manual Z axis imaging, Geometry/combine/filter processing, Multiple Image Stitching. Region and line measurements, Documentation and collaboration

2. <u>Digital Camera Attachment</u>

- 5 MP (or better) monochrome camera or 5MP (or better) camera with a switchable monochrome and color mode
- Pixel size 2.4 micron x 2.4 micron or better
- Around 30 FPS image capture at full resolution or better
- Interface USB 3 or equivalent
- 10-bit digitization or higher
- The same camera should be usable with both Upright and Inverted fluorescence microscope and the necessary mounts and adapters are to be provided.

Optional

Camera A:

- 5 MP CMOS monochrome camera with cooling
- Pixel size 2.4 micron x 2.4 micron or better
- Around 30 FPS image capture at full resolution or better
- Interface USB 3 or equivalent
- 12bit digitization or higher
- The same camera should be usable with both upright and inverted fluorescence microscope and the necessary mounts and adapters are to be provided.

Camera B:

- 5 MP CMOS Color camera
- Pixel size 3.45 micron x 3.45 micron or better
- Around 30 FPS image capture at full resolution or better
- Interface USB 3 or equivalent
- 10-bit digitization or higher
- The same camera should be usable with the Upright and Inverted fluorescence microscope and the necessary mounts and adapters are to be provided.

3. <u>Inverted Fluorescence Microscope</u>

- The inverted microscope should have similar features as the Upright microscope in terms of optical system, observation modes, eyepiece, and stage and stageholder.
- It should be capable of using same objectives as the upright microscope.
- Fluorescence filters and light source should preferably be interchangeable between upright and inverted microscope.
- Other specifications:

LED Fluorescence attachment	:	Six or more Position Fluorescence Turret with Filters for DAPI, FITC, TRITC, CY5 with life more than 10000 hrs
Diascopic illumination	:	High luminescent white LED illuminator (Eco-illumination) or equivalent.
Episcopic illumination	:	LED illuminator, Can be configured with upto 4 different fluorescence LED units; wavelengths: 385, 455, 560, 630 with life of 10000 hours or more.
Tube	:	Pupillary distance: 50-75 mm or equivalent, Siedentopf type; Attachable camera port; Eyepiece/Port:100/0:0/100.
Nosepiece	:	Quintuple Revolving nosepiece or higher.
Observation Modes	:	BF, DIC, Phase Contrast and Fluorescence
Condenser	:	Condenser (NA 0.3 W.D. 72 mm).
Objectives	:	It is desired that all the objectives listed under the Upright fluorescence microscope should also be usable with this inverted fluorescence microscope. In addition, the following additional objectives to be included as <u>*optional items*</u> for this inverted microscope: • Achromat 4X, N.A. 0.10 or better. • Long Working Distance Plan Semi Apo 10X Phase Objective. • Long Working Distance Plan Semi Apo 20X Phase Objective. • Semi Apo/Super Plan Fluor ELWD 40X N.A. 0.60 with DIC.

		• Plan Apochromat 60X1.4 NA or better (Oil, Spring loaded).
Epi Fluorescence attachment	:	Epi-fluorescence filter turret (with main body), complete configuration with at least 3 Epi-fluorescence filter cubes (DAPI, FITC, TRITC and CY5) with life more than 10000 hrs and additional positions for bright-field observation
4. <u>Computer for Upright Microscope</u>: Branded PC with *the latest configuration* Intel Core i7 Processor, 32 GB RAM, 1 TB Hard Disk SSD, Keyboard, Mouse, Windows 10/11 Professional 64-bit OS, 1 GB Graphics Card, 32" Wide LED Monitor. This is the minimum desired configuration.		
5. <u>Computer for Upright Microscope</u>: Branded PC with *the latest configuration* Intel Core i7 Processor, 32 GB RAM, 1 TB Hard Disk SSD, Keyboard, Mouse, Windows 10/11 Professional 64-bit OS, 1 GB Graphics Card, 32" Wide LED Monitor. This is the minimum desired configuration.		
Additional Features: • The microscope, camera, and software should be from the same manufacturer for better integration and no issues with software updates. • Point-wise technical compliance statement should be attached. • An optional 3-year warranty is to be included for microscope, camera and computer • An optional 3-year AMC to be included for microscope, camera and computer • The vendor should submit at least 10 Research papers or articles or Application Notes or technical notes in reputed journals. These should all be available in the public domain. • If required, Demo can be asked for. • Service center of the Distributor or Vendor should be within 50 Km from IIT Bombay.		