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PREBID REPORT

The meeting for the Pre-bid discussion was held online **on 04/12/2025 from 03.00 PM onwards** for GeM Custom bidding for **Supply, Installation and Commissioning of Confocal Microscopy, Upright Fluorescence Microscope, Imaging and Processing Facility and High End Optical Microscope**

The report of the meeting is as mentioned below.

1. **Confocal Microscopy (LASER SCANNING Confocal Microscope with Upgradation capabilities on-site)**

Sl. No.	Reference Document (Required Specifications)	Query Raised by - DSS	Query	Response from IITI
01.	Motorized XY-stage for the movement of specimen using joystick with LCD screen as well as total control by the confocal software	Motorized XY-stage for the movement of specimen using joystick with LCD screen/buttons as well as total control by the confocal software	This specification is a specific for a single manufacturer, most of the reputed manufacturer offers joystick to control motorized stage with different speed options and **no display** is offered as the software shows the stage position. Please amend the highlighted part to allow us and others.	**Accepted** **Can be read as:** Motorized XY-stage for the movement of the specimen using a joystick with an LCD screen / buttons, as well as total control by the confocal software.
02	High resolution confocal grade High N.A. Objectives 10x (0.45 or better N.A)	10x (0.40 or better N.A)	Evident offers high NA 10X objective with 0.4 NA chromatically corrected from 400-1000 nm with excellent field flatness and aberration correction.	**No Change / User Requirement:** The request lowers the minimum acceptable Numerical Aperture (N.A.) from 0.45 to 0.40. N.A. is critical for determining the light-gathering ability and resolution of the objective. Lowering it compromises the maximum resolution and brightness. We request you to quote better NA objectives.

03	The system should have Hybrid Detection Technology capable of working in intensity and Spectral model having at least 2 GaAsP/HyD/SilVIR based detectors having 45% Q.E or better as detection system for dual color simultaneous image acquisition system. System should be upgradable to two additional GaAsP/HyD/SilVIR detector on site in future	The system should have built in Hybrid Detection Technology directly connected to scan head, capable of working in intensity and Spectral model having at least 2 fully spectral GaAsP/HyD/SilVIR based detectors having 45% Q.E or better as detection system for dual color simultaneous image acquisition system. System should be upgradable to two additional Sectral GaAsP/HyD/SilVIR detectors on site in future.	Some manufacturers can offer their low end/ inferior model featuring filter-based systems if 'Spectral' is not mentioned. Also 'In-built' detectors prevent any loss of emission which is observed in fiberbased detection technology.	**No Change / User requirement** We want to make the specifications general so that all the major vendors can participate in the tender, we stick to our present specifications.
04	Galvano Scanner: Galvano Point scanner should provide a speed of 8- 10fps @ 512 x 512 (without Interlacing Imaging/line skipping) & max speed of 200fps @ 512 x 16.	Galvano Point scanner should provide a speed of 8-10fps 512 x 512 (without Interlacing Imaging/line skipping) OR (without Interlacing Imaging/line skipping and without compromising the full FOV) & max speed of 100- 200fps @512 x 16 or better.	Other manufacturers trade off between FOV and scan speed to achieve the desired speed of scanning. Evident offer a different technology that does not compromise the FOV to achieve the speed max 15.8 FPS at 512x512 (Max 114 fps @512x64), therefore please make the requested change to allow us. Alternatively for high speed imaging all the manufactures including us could offer a dedicated resonant scanner that can achieve a speed of 30 FPS @ 512x512 and maximum speed of more than 400 FPS at 512x32 without compromising the FOV	**No Change / User Requirement:** Reducing 200fps-100fps will compromise the application in high-speed imaging using with galvo scanner; speed can not be compromised.
05	Field of View: Confocal System should have 22mm or better FOV imaging capability for Galvano scanner enabling to capture large samples and perform multi-well scanning in less time	Field of View: Confocal System should have 20-22mm or better FOV imaging capability for Galvano scanner enabling to capture large samples and perform multi-well scanning in less time	Evident offers confocal FOV of 20mm. By keeping the FoV 20-22 mm will allow all the major four reputed manufacturers to participate. Hence, please include the requested change to ensure our participation.	**Accepted** Field of View: The Confocal System should have a 20 mm or better FOV imaging capability for the Galvano scanner, enabling to capture a large samples and performing multi-well scanning in less time.

06	All the visible laser lines should be controlled through AOTF or Direct modulation for laser attenuation and switching in synchronization with scanner.	All the visible laser lines should be controlled through AOTF for laser attenuation and switching in synchronization with scanner. It should be onsite upgradable up to 7 or more lasers	AOTF-based laser control is required for precise laser power modulation and the fast switching of excitation laser wavelengths which results in fast imaging and higher light exposure to the sample. Direct Modulation is an older technology and is provided by a specific manufacturer only in their lower Model which can't be upgraded further with more number of lasers or detectors. They also have a higher Model which is with AOTF technology. So please amend this point to ensure disqualification of any lower performance confocal model offered by any company for the scientific interest of the institute.	**No Change / User Requirment:** Direct laser modulation (built-in laser diode modulation) operates in the MHz–GHz range, which is significantly faster than AOTFs that typically function in the kHz to low-MHz range. Direct modulation also eliminates optical losses because the laser is controlled electronically without additional optical elements. However, both AOTF and direct modulation options are being included so that the vendor can quote lasers according to availability, with no compromise in wavelength or laser power specifications.
07	**Upgradation Possibilities:** **2)** Super Resolution Attachment: System should be capable to be attached with an Additional Dedicated Special Array Detector (Super Resolution Detector for Thick Sample) for Super resolution imaging which can achieve XY resolution 90- 100 nm and 300 nm in Z should be able to image 100µm thick sample (product offered must be available on manufacturer website and brochure/Data sheet).	Super Resolution Attachment: System should be capable to be attached with an multi pixel /Special Array Detector (Super Resolution Detector for Thick Sample) OR Multi Pixel Spectral detectors for Super resolution imaging which can achieve XY resolution 90-120 nm and 300 nm in Z should be able to image 100µm thick sample. It should be able to perform 2 colour super resolution imaging simultaneously. (Product offered must be available on manufacturer website and brochure/Data sheet).	The super resolution imaging technology offered by Evident uses High PDE Multi pixel photon counting hybrid array which is a unique technology and not available with any other OEMs and rather they use inferior technology that delivers inferior results. To offer better sensitivity and performance the same detectors are used for confocal imaging as well. The same is mentioned in our brochure also.	**Accepted** **Can be read as:** System should be capable to be attached with an Additional Dedicated Special Array Detector (Super Resolution Detector for Thick Sample) for Super resolution imaging which can achieve XY resolution 100-120 nm and 200-300 nm in Z should be able to image 100µm thick sample (product offered must be available on manufacturer website and brochure/Data sheet). This should be available for upgradation at any point of time in future.

1. Confocal Microscopy (LASER SCANNING Confocal Microscope with Upgradation capabilities on-site)

Sl. No.	Reference Document (Required Specifications)	Query Raised by - Zeiss	Query	Response from IITI
01.	**Inverted Microscope:** High resolution confocal grade High N.A Objectives • 10x (0.45 or better N.A), • 20x (0.7 or better N.A.)-Long Working Distance, • 40x (1.20 or better N.A.)-Silicon Oil objective, • 60x (1.42 or better N.A.)	High resolution confocal grade High N.A Objectives • 10x (0.45 or better N.A), • 20x (0.7 or better N.A.)-Long Working Distance, • 40x (1.20 or better N.A) Oil objective, • 60x (1.4 or better N.A.)	Silicon oil is for very specific application which is not a generic requirement. Zeiss offers 63x with 1.4 NA	**No Change / User Requirment** User requirement: silicone oil objective will provide superior resolution, brightness, and less aberration, 3D imaging in thick sample (RI – n = 1.40) closely matches with live cell/tissue n=1.38 We will consider Silicon oil Objective for 40X as per our application and 60X/63X(1.40 or better NA).
2	**DIC attachment :** Microscope should be capable to have Dual Deck (dual turret) mechanism in future for future upgrades.	Requested to remove	Dual Deck (dual turret) mechanism is specific to one manufacturer.	**Non-specific / User Requirement** A dual-deck system is required for future upgradation, for the integration of a laser ablation unit/FRAP, and provisions for TIRF upgradation, so that the same microscope frame can be used for correlative study by combining different microscopy techniques on the same platform. The upgradability for future-proofing and accommodating advanced techniques (confocal/TIRF) is a critical long-term requirement and should be maintained.
3	**DIC attachment :** Microscope should have 1x & 1.5x/2x intermediate magnification changer which must work as or when Dual deck upgrade happens.	Requested to remove	specific to one manufacturer	**Accepted** **This point can be read as:** Microscope should have 1x & 1.5x/1.6x/2x intermediate magnification changer which must work as or when Dual deck upgrade happens.
4	Microscope should have the capability to project the back focal plane of the objective to a monitor through camera for easy laser alignment for future upgradation to TIRF and/or such other techniques.	Requested to remove.	specific to one manufacturer.	**Non-specific/ User Requirement:** For proper TIRF alignment and reaching the critical angle, checking with respect to the back-focal plane is important; that is why this specification is important as per the User requirement for future upgradation to TIRF.

5	Confocal Scan Head and Detection System: b) The system should have Hybrid Detection Technology capable of working in intensity and Spectral model having at least 2 GaAsP/HyD/SilVIR based detectors having 45% Q.E or better as detection system for dual color simultaneous image acquisition system. System should be upgradable to two additional GaAsP/HyD/SilVIR detector on site	The system should have Hybrid Detection Technology capable of working in intensity and Spectral model having at least 2 GaAsP/HyD/SilVIR based detectors having 45% for spectral range of 410-650nm. System should be upgradable to 1 additional GaAsP/HyD/SilVIR detector on site in future	Mentioning acquisition range with optimal QE ensures all vendors offers their best detectors. 3 or more colour simultaneous imaging have bleed though and cross talk issues.Simultaneous imaging requires only one good detector.	**No Change / User Requirment** We have already mentioned that the detector should have 45% QE, which is applicable to all bidders to quote their best Detectors. We require 2 additional(GaAsP/HyD/SilVIR) detectors for future upgradation.
6	Field of View: Confocal System should have 22mm or better FOV imaging capability for Galvano scanner enabling to capture large samples and perform multi-well scanning in less time	Confocal System should have 20mm or better FOV imaging capability	20mm FOV is standard.	**Accepted** Field of View: The Confocal System should have 20mm or better FOV imaging capability for the Galvano scanner, enabling to capture of large samples and performing multi-well scanning in less time.
7	Scan Resolution: Maximum scan resolution of up to 8K x 8K or better.	Maximum scan resolution of up to 6K x 6K or better.	Confocal imaging beyond 4kx4k is not required so 6K or better is enough.	**No Change / User Requirment** For some applications with a low magnification objective, we need 8K x 8K resolution or better to meet the Nyquist criterion while utilizing the full FOV.
8	Lasers: Pre-aligned Solid state laser launcher with atleast 15mw or better laser power:	Remove word "Pre-aligned"	specific to one manufacturer.	**Non-Specific / User Requirment:** Lasers are integrated modules, factory setup, and pre-aligned by any make/model *(for permanent alignment and minimal maintenance by the user).*

1. **Confocal Microscopy (LASER SCANNING Confocal Microscope with Upgradation capabilities on-site)**

Sl. No.	Reference Document (Required Specifications)	Query Raised by - Leica	Query	Response from IITI
01.	**Inverted Microscope:** Bright field, Fluorescence and DIC illumination with accessories for confocal scan head attachment	Bright field, Fluorescence and/or DIC illumination with accessories for confocal scan head attachment	For confocal DIC imaging laser is the light source, which is already a polarized illumination and delivers a very good transmitted light image without the DIC prism.	**No Change / User Requirment:** We know that a laser, being polarized light, may not need either an analyzer or a polarizer, but it requires a DIC prism for creating the DIC effect during confocal-based DIC imaging. We also need DIC Prism for creating the DIC effect using a white LED.
02	High resolution confocal grade High N.A. Objectives: • 40x (1.20 or better N.A.)- Silicon Oil objective, • 60x (1.42 or better N.A.)	High resolution confocal grade High N.A. Objectives: • 40x (1.20 or better N.A.)- Silicon Oil/Glycerol/equivalent objective for live cell applications, • 60/63x (1.4 or better N.A.)	Silicon Oil objective is used for Live Cell imaging only as the refractive index of that medium is closer to the live cell samples. (Though Live cell imaging has not been asked in this tender). Leica provides Glycerol immersion based objectives for the same purpose. Refractive index same as silicon oil. Request to change it in order to make it more generalized The German manufacturers provide 63x and the Japanese manufacturers provides 60x objectives. Request this change to make it more generalized.	**No Change / User requiement:** Silicone oil objective will provide superior resolution, brightness, and less aberration, 3D imaging in thick sample (RI – n = 1.40) closely matches with live cell/tissue n = 1.38 Glycerol is hygroscopic in nature, because of which it absorbs water from the environment, which alters its refractive index. Therefore, glycerol immersion objectives are not recommended for our application. We will consider Silicon oil Objective for 40X as per our application and 60X/63X(1.40 or better NA).

03	**DIC Attachment:** DIC for 10x to 60x objectives with analyzer and polarizer attachment, sliders and modules for the respective objectives with either motorized or intelligent functionalities.	Please make this point as optional item. DIC Attachment (Optional item):	With the Leica STELLARIS system, we can provide brilliant enough transmitted light image without the DIC prisms. Laser is already a polarized light for this kind of imaging.	**No Change /User Requirement** A DIC prism is necessary to generate the split, slightly shifted beams that create the differential contrast. This component is essential for generating a DIC image using non-confocal light paths, often used to visualize morphology alongside fluorescence. We understand that a laser, being polarized light, may not need either an analyzer or a polarizer, but it requires a DIC prism for creating the DIC effect during confocal-based DIC imaging. We also need DIC Prism for creating the DIC effect using a white LED.
04	Microscope should be capable to have Dual Deck (dual turret) mechanism in future for future upgrades.	Microscope should be capable to have Dual Deck (dual turret) or infinity port mechanism in future for future upgrades.	Additional deck is to accommodate additional optical component, infinity port is also for the same purpose. Different companies have different ways to introduce the additional optical components for future upgrades	**Accepted:** **Can be read as:-** The microscope should be capable of having a Dual Deck (dual turret) or infinity port mechanism in the future for upgrades (like for the integration of a laser ablation unit/FRAP and provisions for TIRF upgradation).
05	Microscope should have 1x & 1.5x/2x intermediate magnification changer which must work as or when Dual deck upgrade happens.	Request to please remove the point.	For confocal imaging anyway there is a Scan zoom factor, which has been asked to be 1-40 x in this tender itself. And additional optical component in the lightpath has no advantage but will be responsible for unnecessary light-loss.	**No Change / User Requirement:** A 1X and 1.5X/2X Intermediate Magnification changer is required for some specific applications where more zooming is required. This is also important to meet proper Nyquist sampling criteria for future upgradation with respect to a specific camera pixel size(The intermediate magnification changer (e.g., 1x, 1.5x, 2x) is a crucial tool for optimal camera pixel sampling (Nyquist Criterion) and for adjusting the Field of View (FOV) without switching objectives).

06	**Confocal Scan head and detection System:** b. The system should have Hybrid Detection Technology capable of working in intensity and Spectral model having at least 2 GaAsP/HyD/SilVIR based detectors having 45% Q.E or better as detection system for dual color simultaneous image acquisition system.	b. The system should have Hybrid Detection Technology capable of working in intensity and Spectral model having at least 3 GaAsP/HyD/SilVIR based detectors having 45% Q.E or better as detection system for dual color simultaneous image acquisition system.	For eye observation also DAPI, FITC, TRITC (blue, green, red) 3 filters has been asked. For imaging 2 detectors for 2 colours (simultaneously) are very less. Request to make it to 3 detectors so that blue, green, red 3 colour simultaneously can be done. With 2 additional detectors for future upgrade option.	**No Change / User Requirement:** We have already mentioned that the detector should have 45% QE, which is applicable to all bidders to quote their best Detectors. We require 2 additional(GaAsP/HyD/SilVIR) detectors for future upgradation. *We will stick to our present specification with 2 detector system, which can be upgraded with 2 more detectors in the future.*
07	**5. Confocal Software:** d. ROI bleach for FRAP experiment	Please make it for future upgrade option.	As FRAP is for molecular dynamics and thus can be used for live samples only. In this system, live cell imaging has been asked as an upgrade option, so requesting to make the FRAP also as upgrade option.	**No Change / User requirement:** Although we have asked for a Live-cell imaging setup as an upgradable option but, FRAP is an important application requirement for us, where we will do FRAP/photostimulation on live-cell for shorter duration, so this should be a standard feature of the offered system and not a future upgradation.
08	**2) Super Resolution Attachment:** System should be capable to be attached with an Additional Dedicated Special Array Detector (Super Resolution Detector for Thick Sample) for Super resolution imaging which can achieve XY resolution 90-100 nm and 300 nm in Z should be able to image 100µm thick sample (product offered must be available on manufacturer website and brochure/Data sheet). This should be available for upgradation at any point of time in future.	System should be capable to be attached with an Special Array Detector (Super Resolution Detector for Thick Sample) for Super resolution imaging which can achieve XY resolution 100-120 nm and 200- 300 nm in Z should be able to image 100µm thick sample This should be part of the present system as standard delivery.	In the modern time any system without High-Resolution attachment is like systems of older generation. The SR based imaging modality will provide much better, precise and accurate image date compared to Regular confocal images. All the confocal manufacturing companies have this Super Resolution attachment.	**Accepted** **Can be read as:** System should be capable to be attached with an Additional Dedicated Special Array Detector (Super Resolution Detector for Thick Sample) for Super resolution imaging which can achieve XY resolution 100-120 nm and 200-300 nm in Z should be able to image 100µm thick sample (product offered must be available on manufacturer website and brochure/Data sheet). This should be available for upgradation at any point of time in the future.

2. **Inverted Fluorescence Microscope (Motorized Inverted Fluorescence with DIC, Monochrome Camera, Software and Live-cell Imaging Capability).**

Sl. No.	Reference Document (Required Specifications)	Query Raised by - DSS	Query	Response from IITI
1.	Body-mounted shuttle Switches /function buttons (or equivalent) for filter turret rotation and fluorescence/ transmitted mode selection. Intermediate magnification changer: 1.5× (user-exchangeable to 2×), The magnification must be correctly detected/encoded by the software. There should be an active right side port also to attach 2 cameras at a time.	Body-mounted shuttle switches/function buttons (or equivalent remote pod with screen) for filter turret rotation and fluorescence / transmitted mode selection. Intermediate magnification changer: 1.5/1.6 better and user-exchangeable to 2×, The magnification must be correctly detected / encoded by the software. There should be an active right side port also to attach 2 cameras at a time.	Our system offers a remote pod for controlling all the motorized functions of the microscope, to avoid any operational vibration due to the operation while the sample is focused. Our microscope offers 3 position built-in coded Intermediate magnification changer with 1x, 1.6X and 2X.	**Accepted** **Can be read as:** Body-mounted shuttle switches/function buttons (or equivalent remote pod with screen) for filter turret rotation and fluorescence/transmitted mode selection. Intermediate magnification changer: 1.5×/1.6X (exchangeable to 2×). There should be an active right side port also to attach 2 cameras at a time.
2	Imaging FOV: Internal optical path supporting 20-22 mm FOV or better at the imaging port for large-format cameras. Minimum 3 or more manual camera ports (two side, one rear) with selectable light path splits: eyepiece 100%, left 100%, right 100%, or eyepiece 20%/left 80% or eyepiece 20%/right 80%. Motorized light path selection for visual and camera imaging.	Imaging FOV: Internal optical path supporting 20-22 mm FOV or better at the imaging port for large-format cameras. Minimum 3 or more manual camera ports (two side, one rear / trinocular) with selectable light path splits: eyepiece 100%, left 100%, right 100%, or eyepiece 20%/left 80% or eyepiece 20%/right 80%. Motorized light path selection for visual and camera imaging.	Evident by default offers Motorized 4 positions Eyepiece 100%, left 100%, right 100%, eyepiece 50%/left 50%. Please make this change to allow us.	**Accepted** **Can be read as:** Internal optical path supporting 20-22 mm FOV or better at the imaging port for large-format cameras. Minimum 3 or more manual camera ports (two side, one rear) with selectable light path splits: eyepiece 100%, left 100%, right 100%, or eyepiece 20%/left 80% or eyepiece 20%/right 80% or eyepiece 50%/left 50%. Motorized light path selection for visual and camera imaging.
3	**Z-focus:** Fully motorized Z-drive with 10 nm Z step size (or better) with a physical coarse and fine focus knob featuring rotary encoder, fine/coarse toggle, and automatic step switching based on objective magnification. Must include escape (anti-collision) and refocus mechanisms to protect specimens / objectives and enable rapid return to the previous focus position.	Z-focus: Fully motorized Z-drive with 10 nm Z step size (or better) with a physical coarse and fine focus knob featuring software controlled fully motorized/ rotary encoder/ Fine / coarse toggle, and automatic step switching based on objective magnification. Must include escape (anti-collision) and refocus mechanisms to protect Specimens / objectives and enable rapid return to the previous focus position.	The term Rotary encoder is specific to Nikon. Our nosepiece/ Z-drive are fully motorized and can be controlled with the software to achieve same or better precision as that with a rotary encoder while focusing. Also, in the next point nosepiece with position-sensing feedback is already asked which will serve the purpose.	**Accepted** Can be read as: Z-focus: Fully motorized Z-drive with 10 nm Z step size (or better) with a physical coarse and fine focus knob featuring software-controlled, fully motorized/rotary encoder, fine/coarse toggle, and automatic step switching based on objective magnification. Must include escape (anti-collision) and refocus mechanisms to protect specimens/objectives and enable rapid return to the previous focus position.

4	10X Objective: Plan Fluor/Apochromat, NA ≥0.45, WD ≥3.5mm or better.	10X Objective: Plan Fluor/Apochromat, NA ≥0.4, WD ≥3mm or better.	Evident offers apochromatic XAPO 10X objective with excellent field flatness, aberration correction and chromatically corrected from 400 - 1000nm with a NA of 0.4 and WD of 3.1 mm.	**No Change / User Requirement** The request lowers the minimum acceptable Numerical Aperture (N.A.) from 0.45 to 0.40. N.A. is critical for determining the light-gathering ability and resolution of the objective. Lowering it compromises the maximum resolution and brightness. We request that you quote better NA objectives.
5	20X Objective: Plan Fluor / Apochromat, NA ≥0.45, extra- long WD (6.9–8 mm), cover glass correction collar 0–2 mm.	20X Objective: Plan Fluor / Apochromat, NA ≥0.45, extra- long WD (6.5–7.8 mm or better), cover glass correction collar 0–2 mm.	Evident offers Long working distance 20X objective with a NA of 0.45 and WD of 6.5–7.8 mm with correction collar.	**Accepted** **Can be read as:** 20X Objective: Plan Fluor/Apochromat, NA ≥0.45, extra-long WD (6.9–7.8 mm), cover glass correction collar 0–2 mm.
6	**Camera:** High-resolution, high- sensitivity Monochrome CMOS Camera with an 85% peak QE at 500 nm (sCMOS or CCD equivalent). **Sensor:** ≥ 35MP or better resolution on a large sensor approximately full frame (minimum ~35 × 23 mm or better) for maximal FOV utilization.	Camera: High-resolution, high-sensitivity Monochrome sCMOS Camera with an 80-85% peak QE at 500-550 nm (sCMOS or CCD equivalent). Sensor: ≥ 4-35MP or better resolution on a large sensor approximately full frame (minimum ~13-35 × 13-23 mm or better) for maximal FOV utilization. Pixel size 6.45um	These are DigiSight 50M specs from Nikon. For fluorescence imaging monochrome sCMOS cameras are used by experts, the asked specification cannot be matched by conventional high sensitive sCMOS cameras and require large sensor format cameras. High performance Fluorescence imaging is not only determined by QE/ or resolution but highest S/N. Therefore, please mention the read noise 0.9-.15 & dark current 0.6e/pixel to assure a better S/N ratio while fluorescence imaging.	**No Change / User Requirement** High-resolution, high-sensitivity Monochrome CMOS Camera with an 85% peak QE or better at 500 nm (sCMOS or CCD or CMOS equivalent) QE is non-negotiable for our application. The 35 MP resolution on a large sensor (e.g., 35*23 mm) ensures that the camera can capture the full Field of View (FOV). The scientific necessity of maximizing FOV is non-negotiable for high-throughput efficiency.

7	**Z Drift Compensation System for Live Cell Imaging:** Microscope system should be equipped with hardware-based, real- time focus Drift compensation technology having LED (830nm or higher) based mechanism for Continuous Focus correction monitoring system to achieve drift-free autofocusing during long-term time-lapse and live-cell imaging. Focus correction technology should be usable for Glass as well as Plastic dishes.	Microscope system should be equipped with hardware-based, real-time focus Drift compensation technology having LED/ Laser (830nm or higher) based mechanism for Continuous Focus correction monitoring system to achieve drift-free autofocusing during long-term time-lapse and live-cell imaging. Focus correction technology should be usable for Glass as well as Plastic dishes.	Evident offers low phototoxicity 830nm laser for hardware-based Z drift compensation technology that works in both continuous focus and single shot autofocus mode for both glass and plastic dishes.	**Accepted** **Can be read as:** The microscope system should be equipped with hardware-based, real-time focus Drift compensation technology, having an LED/Laser (830nm or higher) based mechanism for a Continuous Focus correction monitoring system to achieve drift-free autofocusing during long-term time-lapse and live-cell imaging. Focus correction technology should be usable for Glass as well as Plastic dishes.
8	**Note:** All the components of Microscope, Camera, and software should be from a single manufacturer for better synchronization and utility of the complete system	All the components of Microscope, Camera, and software should be from a single manufacturer for better synchronization and utility of the complete system	Third party cameras are in general better performing than the cameras generally offered by typical microscope manufacturing companies as they don't manufacture sCMOS cameras. Our OEM provides fully compatible third party sCMOS cameras for optimum performance.	**Request considered:** If all components come from a single manufacturer, the system's overall integrity is improved, and it ensures better service and support in the future. *But considered the same for effective participation.* *Note: It is not mandatory, but a preferred criterion.*

2. **Inverted Fluorescence Microscope (Motorized Inverted Fluorescence Microscope with DIC, Monochrome Camera, Software and Live-cell Imaging Capability).**

Sl. No.	Reference Document (Required Specifications)	Query Raised by - Zeiss	Query	Response from IITI
01.	Minimum 3 or more manual camera ports (two side, one rear) with selectable light path splits: eyepiece 100%, left 100%, right 100%, or eyepiece 20%/left 80% or eyepiece 20%/right 80%. Motorized light path selection for visual and camera imaging		Minimum 2 or more motorized camera ports.	**No Change / User Requirement:** Three ports are often required for advanced imaging systems to simultaneously accommodate different detectors: a High-resolution scientific camera (e.g., sCMOS) for fast, low-light imaging; a Color camera for histological/brightfield work; and a Point detector (e.g., PMT or specialized sensor) for advanced techniques like TIRF Imaging or future Near-Infrared (NIR) detection. The ability to select the light path is crucial to optimize signal-to-noise ratio by ensuring 100% of the signal goes to the most sensitive camera for specific tasks (e.g., low-light fluorescence).

02	Bertrand Lens: Built-in Bertrand lens with linear scaling, must be integrated and recognized by the microscope body for alignment/inspection tasks.	Requested to remove.	Not required for live cell imaging	**No Change / User Requirement** The Bertrand Lens is an essential optical component used to view the back focal plane (BFP) of the objective lens. The feature is crucial for proper system calibration and reproducible high-quality imaging.
03	Stage: Motorized XY scanning stage for the movement of specimen using ergo joystick as well as total control by the quoted software. Should supply compatible universal sample holders (ring holders, 96-well plate clamps, slide/dish holders) with the motorized stage.	Motorized XY scanning stage with travel range 130x100 mm.	To ensure the scanning of complete 96 well plate.	**No Change / User requirement:** Different manufacturers have different travel ranges, considering the same-quoted model should be compatible for complete scanning of universal sample holders (ring holders, 96 well plate clamps, slide/dish holders) with the motorized stage.
04	Double-deck upgrade: Should be upgradable to double-deck to increase infinity space for devices such as a second epi-fluorescence filter cube turret, barrier filter wheel, rear port unit, and future confocal/TIRF upgrades.	Requested to remove.	specific to one manufacturer.	**No Change / User Requirement** A dual-deck system is required for future upgradation, for the integration of a laser ablation unit/FRAP, and provisions for TIRF upgradation, so that the same microscope frame can be used for correlative study by combining different microscopy techniques on the same microscope platform. The upgradability for future-proofing and accommodating advanced techniques (confocal/TIRF) is a critical long-term requirement and should be maintained.
05	60X/63X Oil Objective: Plan Fluor/Apochromat, NA ≥1.42	60X/63X Oil Objective: Plan Fluor/Apochromat, NA ≥1.40	Zeiss offers 63x with 1.4 NA.	**Accepted:** **Can be read as:** 60X/63X Plan fluor/Apochromat Oil Objective with NA ≥1.40
06	Camera: High-resolution, high-sensitivity Monochrome CMOS Camera with an 85% peak QE at 500 nm (sCMOS or CCD equivalent)		Camera: High-resolution, high-sensitivity Monochrome CMOS Camera with an 82% peak QE at 500 nm (CMOS or equivalent)	**No Change / User requirement:** QE is non-negotiable for our application.

07	Sensor: ≥ 35MP or better resolution on a large sensor approximately full frame(minimum ~35 × 23 mm or better) for maximal FOV utilization.	Sensor: ≥ 20MP or better resolution on a large sensor approximately 17.5 mm or better.	The camera specification is specific to one manufacturer.	**Non-Specific / User requirement:** The scientific necessity of maximizing FOV (i.e., matching the camera sensor size to the system's projected image circle) is non-negotiable for high-throughput efficiency.
08	Z Drift Compensation System for Live Cell Imaging: Microscope system should be equipped with hardware-based, real-time focus Drift compensation technology having LED (830nm or higher) based mechanism for Continuous Focus correction monitoring system to achieve drift-free autofocusing during long-term time-lapse and live-cell imaging. Focus correction technology should be usable for Glass as well as Plastic dishes.		Z Drift Compensation System for Live Cell Imaging: Microscope system should be equipped with hardware-based, real-time focus Drift compensation technology having IR LED (850nm or higher) based mechanism for Continuous Focus correction monitoring system to achieve drift-free autofocusing during long-term time-lapse and live-cell imaging. Focus correction technology should be usable for Glass as well as Plastic dishes.	**Accepted:** **Can be read as:** LED / Laser (830nm or better) is being considered. Since 850nm is better, it won't be a problem, and we will consider.
09	6D-Acquisition: Should support multi-dimensional imaging workflows, allowing the user to automatically acquire data across 6 simultaneous dimensions: X, Y (MultiArea/Multipoint), Z (Focus Stack), Lambda (Wavelength), Time(T), and Multipoint/Sample (M).		4D Acquisition: Should support multi-dimensional imaging workflows, allowing the user to automatically acquire data across 4 simultaneous dimensions: X, Y (MultiArea/Multipoint), Z (Focus Stack), Time(T).	**No Change / User requirement:** The 6D capability (X, Y, Z, lambda, T, M) is required to fully capture dynamic biological processes: X, Y for spatial location/area; Z (Focus Stack) for 3D information; lambda (Wavelength) for multiple fluorescent markers; T (Time) for kinetic data; and M (Multipoint) for high-throughput screening of different samples/wells. Automation of this acquisition is fundamental for reproducibility and throughput. The 4D query is incomplete as it omits the crucial Z (3D structure) and lambda (Multi-color fluorescence) dimensions. 6D is the scientific requirement for comprehensive live-cell and multi-color volumetric imaging, and should be retained.

2. Inverted Fluorescence Microscope (Motorized Inverted Fluorescence Microscope with DIC, Monochrome Camera, Software and Live-cell Imaging Capability).

Sl. No.	Reference Document (Required Specifications)	Query Raised by - Leica	Query	Response from IITI
01.	**Controls:** Body-mounted shuttle switches/function buttons (or equivalent) for filter turret rotation and fluorescence/transmitted mode selection. Intermediate magnification changer: 1.5× (user-exchangeable to 2×), The magnification must be correctly detected/encoded by the software. There should be an active right side port also to attach 2 cameras at a time.	Controls: Body-mounted shuttle switches/function buttons (or equivalent) for filter turret rotation and fluorescence/transmitted mode selection. Intermediate magnification changer: 1.5× (userexchangeable to 2×), The magnification must be fully motorized in nature and correctly detected by the software. There should be an option to upgrade for an active right side port to attach 2 cameras at a time	For a fully motorized microscope frame, this should be built-in and all the companies can provide that. For coded system, it should be moved/adjusted manually. For one camera system, the 2nd port will be of no use.	**No Change / User Requirement** The Body-mounted controls provide immediate, tactile control for rapid manual work. The Intermediate Magnification changer is necessary for optimal camera pixel sampling (Nyquist). A Dual Camera Port on one side is necessary to perform simultaneous multi-channel imaging (for e.g., fast calcium imaging on one camera, and a second slower fluorescent marker on the other).
02	**Imaging FOV:** Internal optical path supporting 20-22 mm FOV or better at the imaging port for large-format cameras. Minimum 3 or more manual camera ports (two side, one rear) with selectable light path splits: eyepiece 100%, left 100%, right 100%, or eyepiece 20%/left 80% or eyepiece 20%/right 80%. Motorized light path selection for visual and camera imaging	Imaging FOV: Internal optical path supporting 19-22 mm FOV or better at the imaging port for large-format cameras. The frame should have option to upgrade for additional ports in future for additional cameras.	Presently for one camera-based system asking for 3 ports is unnecessary and not justifiable. In future if the system gets upgraded to multiple cameras, that time those additional ports can be integrated.	**No Change / User requirement:** 20-22 mm FOV or better. Minimum 3 ports are required for multi-channel imaging and future-proofing. This allows simultaneous connections of High-speed sCMOS (fluorescence), Color camera (brightfield/staining), and Point Detector/Specialized Sensor (TIRF/NIR). The selectable light path splits (for e.g.,100 to the camera) are crucial to maximize Signal-to-Noise Ratio (S/N ratio) for low-light imaging. Reduced field of view decreases the available scan area, which in turn lowers statistical accuracy in data analysis.
03	Bertrand Lens: Built-in Bertrand lens with linear scaling must be integrated and recognized by the microscope body for alignment/inspection tasks.	Please delete the point.	The Bertrand Lens is required to visualise/align laser spot at the back focal plane of the objective, and is required only for TIRF systems. For routine inverted fluorescence microscope it is not required at all and will increase the cost unnecessarily without being used.	**No Change / User requirement:** The Bertrand Lens is necessary for viewing the objective's Back Focal Plane (BFP). This is a fundamental optical check for aligning specialized illumination techniques (DIC, Phase Contrast, or TIRF) to ensure optimal and homogeneous light delivery.

04	**Double-deck upgrade:** Should be upgradable to double-deck to increase infinity space for devices such as a second epi-fluorescence filter cube turret, barrier filter wheel, rear port unit, and future confocal/TIRF upgrades.	Double-deck upgrade: Should be upgradable to doubledeck/infinity port to increase infinity space for devices such as a second epi-fluorescence filter cube turret, barrier filter wheel, rear port unit, and future confocal/TIRF upgrades.	Different companies have different mechanism to include additional optical components for upgrades. Some uses additional deck, some uses additional port, the change is requested to make it more general.	**Accepted:** **Can be read as:** Microscope should be Upgradable to double-deck/infinity port to have Dual Deck (dual turret) or infinity port mechanism in future for future upgrades, such as a second epi-fluorescence filter cube turret, barrier filter wheel, rear port unit, and for the integration of a laser ablation unit/FRAP, and provisions for TIRF upgradation.
05	Should have the Laser safety interlock signal output available (as default) on the stand for coordinated control for future upgradation of laser-based systems.	Laser Safety (upgrade option): Should have option to upgrade to the Laser safety interlock signal output on the stand for coordinated control for future upgradation of laser-based systems.	As presently the system is not having any laser-based functionality, the laser-safety module is absolutely unnecessary. When the system will be upgraded to laser based system like confocal/TIRF the laser safety will come by default during then. At present it will increase the cost unnecessarily without being used.	**Accepted** **Can be read as:** Should have the option to upgrade to the Laser safety interlock signal output available on the microscope stand for coordinated control for future upgradation of laser-based systems.
06	**Fluorescence illuminator:** LED system with at least 4 independently controllable wavelengths covering DAPI (~385 nm), FITC/GFP (~475 nm), TRITC/Cy3 (~550 nm), and Cy5 (~620 nm) regions.	Fluorescence illuminator: LED system with at least 3/4 independently controllable wavelengths covering DAPI (~385 nm), FITC/GFP (~475 nm), TRITC/Cy3 (~550 nm), and Cy5 (~620 nm) regions.	The LED model Leica provides has to independently controllable LEDs, but provides all the wavelengths asked here, as for the Red and Far-red it uses one broad-band LED and the Blue and Green are separate and have relatively narrow bands.	**Accepted** **Can be read as:** Fluorescence illuminator: LED system with at least 3-4 independently controllable wavelengths covering DAPI (~385 nm), FITC/GFP (~475 nm), TRITC/Cy3 (~550 nm), and Cy5 (~620 nm) regions.
07	**DIC optics:** Complete DIC set for large-FOV imaging, including analyzer and polarizer compatible with the system's turret, plus DIC prisms/sliders matched to the supplied objectives.	DIC optics: Completely motorized DIC set for large-FOV imaging, including analyzer and polarizer compatible with the system's turret, plus DIC prisms/sliders matched to the supplied objectives, all components should be fully motorized.	The system is mainly for live cell imaging, i.e. for time lapse images of several frames. if the DIC components are not motorized, they will not go out of the light-path during the fluorescence imaging as well and will unnecessary cut-out signals during such imaging	**Accepted:** **Can be read as:** Complete automatic/motorized DIC set for large-FOV imaging, including analyzer and polarizer compatible with the system's turret, plus DIC prisms/sliders matched to the supplied objectives. Fluorescence to DIC should be changed -should be in a single click of software.

08	**20X Objective:** Plan Fluor/Apochromat, NA ≥0.45, extralong WD (6.9–8 mm), cover glass correction collar 0–2 mm. • 60X/63X Oil Objective: Plan Fluor/Apochromat, NA ≥1.42	20X Objective: Plan Fluor/Apochromat, NA ≥0.40, extralong WD (6.9–8 mm), cover glass correction collar 0–2 mm. • 60X/63X Oil Objective: Plan Fluor/Apochromat, NA ≥1.40	Request to make it more generalized numbers, so that we can also participate.	**Accepted** Can be read as: 20X objective: Plan Fluor/Apochromat, NA ≥0.45, extra-long WD (6.9–8 mm), cover glass correction collar 0–2 mm. 60X/63X Oil Objective: Plan Fluor/Apochromat, NA ≥ 1.40 or better).
09	**Camera:** High-resolution, high-sensitivity Monochrome CMOS Camera with an 85% peak QE at 500 nm (sCMOS or CCD equivalent) **Sensor:** ≥ 35MP or better resolution on a large sensor approximately full frame (minimum ~35 × 23 mm or better) for maximal FOV utilization	High-resolution, high-sensitivity Monochrome CMOS Camera with an 80% peak QE at 500 nm (sCMOS or CCD equivalent) Sensor: ≤ 35MP or better resolution on a large sensor approximately full frame for maximal FOV utilization.	The camera specification is very specific to a particular one model of a particular one company, changes requested to make it more generalized so that everyone can participate.	**No Change / User requirement:** High-resolution, high-sensitivity Monochrome CMOS Camera with an 85% peak QE or better at 500 nm (sCMOS or CCD or CMOS equivalent). QE is non-negotiable for our application. The 35 MP resolution on a large sensor (e.g., 35*23 mm) ensures that the camera can capture the full Field of View (FOV). The scientific necessity of maximizing FOV is non-negotiable for high-throughput efficiency.
10	**Controller:** The quoted On-stage Incubation system should have the facility to control Humidity / Temperature / CO2 etc. with built-in digital gas mixer for 100% CO2 cylinder; precise control of CO2 concentration; humidification and temperature control for live-cell imaging.	Controller: The quoted On-stage Incubation system should have the facility to control Humidity / Temperature / CO2 etc. with built-in digital/manual gas mixer for 100% CO2 cylinder; precise control of CO2 concentration; humidification and temperature control for live-cell imaging.	Change requested to make it more generalized so that everyone can participate, and it won't limit any scientific imaging application of the system.	**Accepted** **Can be read as**: The quoted On-stage Incubation system should have the facility to control Humidity / Temperature / CO_2, etc., with a built-in digital/manual gas mixer for 100% CO_2 cylinder; precise control of CO_2 concentration; humidification and temperature control for live-cell imaging.
11	Software should have a Computational Image Deconvolution (Out-of-focus blur removal) via an AI model to achieve Confocal-like image quality from 2D and 3D widefield fluorescence data. -- Automatic and significant increase in Signal-to-Noise (S/N) ratio and image contrast. -- One-Click Enhancement that applies the model instantly to raw, archived, or live images with no user training required.	Please make this point as optional or upgrade option.	This is very specific to a particular company. Requesting to generalize and make it as upgrade option.	**No Change / User Requirement** We require Software having a Computational Image Deconvolution (Out-of-focus blur removal) via an AI model to achieve Confocal-like image quality from 2D and 3D widefield fluorescence data. -- Automatic and significant increase in Signal-to-Noise (S/N) ratio and image contrast. --One-Click Enhancement that applies the model instantly to raw, archived, or live images with no user training required.

3. **Imaging & Processing Facility (Motorized Inverted Fluorescence Microscope with DIC, Color Camera and Software)**

Sl. No.	Reference Document (Required Specifications)	Query Raised by - DSS	Query	Response from IITI
01.	**Controls:** Body-mounted shuttle switches/function buttons (or equivalent) for filter turret rotation and fluorescence / transmitted mode selection. Intermediate magnification changer:1.5×(exchangeable to 2×). There should be an active right side port also to attach 2 cameras at a time.	Body-mounted shuttle switches/function buttons (or equivalent remote pod with screen) for filter turret rotation and fluorescence / transmitted mode selection.Intermediate magnification changer: 1.5/1.6 better and 2×, The magnification must be correctly detected /encoded by the software. There should be an active right side port also to attach 2 cameras at a time.	The exchangeable 2X intermediate magnification chamber is specific to a single manufacturer. Evident offers 3 position built-in coded Intermediate magnification changer with 1x, 1.6X and 2X.	**Accepted** **Can be read as:** Body-mounted shuttle switches/function buttons (or equivalent remote pod with screen) for filter turret rotation and fluorescence/transmitted mode selection. Intermediate magnification changer: 1.5×/1.6X (exchangeable to 2×). There should be an active right side port also to attach 2 cameras at a time.
2	Imaging FOV: Internal optical path supporting 22mm or better FOV at the imaging port for large-format cameras. Minimum 3 or more manual camera ports (two side, one rear) with selectable light path splits: eyepiece 100%, left 100%, right 100%, or eyepiece 20%/left 80% or eyepiece 20%/right 80%. Motorized light path selection for visual and camera imaging	Imaging FOV: Internal optical path supporting 22 mm FOV or better at the imaging port for large-format cameras. Minimum 3 or more manual camera ports (two side, one rear / trinocular) with selectable light path splits: eyepiece 100%, left 100%, right 100%, or eyepiece 20-50%/left 50-80%. Motorized light path selection for visual and camera imaging.	Evident by default offers Motorized 4 positions Eyepiece 100%, left 100%, right 100%, eyepiece 50%/left 50%. Please make this change to allow us.	**Accepted** **Can be read as:** Internal optical path supporting 22 mm FOV or better at the imaging port for large-format cameras. Minimum 3 or more manual camera ports (two side, one rear) with selectable light path splits: eyepiece 100%, left 100%, right 100%, or eyepiece 20%/left 80% or eyepiece 20%/right 80% or eyepiece 50%/left 50%. Motorized light path selection for visual and camera imaging.
3	**Objectives:** 10X Objective: Plan Fluor / Apochromat, NA ≥0.30, WD ≥15.0 mm or better. ▯ 20X Objective: Plan Fluor / Apochromat, NA ≥0.45, extra- long WD (6.9–8.0 mm or better), cover glass correction collar 0–2 mm.	10X Objective: Plan Fluor/Apochromat, NA ≥0.30, WD ≥10.0 mm or better. ▯ 20X Objective: Plan Fluor / Apochromat, NA ≥0.45, extra-long WD (6.5–7.8 mm or better), cover glass correction collar 0–2 mm.	Evident offers Plan fluor 10X objective with excellent field flatness and chromatically corrected from 400-1000nm with a NA of 0.3 and WD of 10mm. Evident offers 20x Long working distance objective lens with 0.45 NA and WD of 6.5 to 7.8mm with correction collar. Therefore the mentioned changes will allow us to participate.	**No Change / User Requirement:** Compromising the NA is not acceptable, and a longer working distance provides greater physical clearance between the objective and the sample, accommodating thick culture dishes, microfluidic chambers, and similar accessories.

4	**Digital imaging System** **Sensor:** ≥20 MP on a large sensor approximately full-frame (minimum ~35 × 23 mm)	Sensor: ≥8-20 MP on a large sensor approximately full-frame (minimum ~10-35 × 10-23 mm) for maximal FOV utilization.	These camera specs are for Nikon Digi Sight 10, hence the suggested change will ensure participation of maximum bidders	**Accepted** **Can be read as:** Camera: High-resolution, low-noise color CMOS. Sensor: 18-20 MP on a large sensor full frame for maximal FOV utilization.

3. Imaging & Processing Facility (Motorized Inverted Fluorescence Microscope with DIC, Color Camera and Software)

Sl. No.	Reference Document (Required Specifications)	Query Raised by - Zeiss	Query	Response from IITI
01.	Minimum 3 or more manual camera ports (two side, one rear) with selectable light path splits: eyepiece 100%, left 100%, right 100%, or eyepiece 20%/left 80% or eyepiece 20%/right 80%. Motorized light path selection for visual and camera imaging		Minimum 2 or more motorized camera ports.	**No Change / User Requirement:** Three ports are often required for advanced imaging systems to simultaneously accommodate different detectors: High-resolution scientific camera (e.g., sCMOS) for fast, low-light imaging; Color camera for histological/brightfield work; and a Point detector (e.g., PMT or specialized sensor) for advanced techniques like TIRF Imaging or future Near-Infrared (NIR) detection. The ability to select the light path is crucial to optimize signal-to-noise ratio by ensuring 100% of the signal goes to the most sensitive camera for specific tasks (e.g., low-light fluorescence).
02	Controller:Dedicated integratedcontroller/joystick with LCD display controlling allmotorized/intelligent components.	Requested to remove.	For Manual stage Joystick will not work	**No Change / User requirement –** Dedicated integrated controller/joystick with LCD display controlling all motorized / intelligent components. It is not only for the Stage.

03	Double-deck upgrade: Should be upgradable to double-deck to increase infinity space for devices such as a second epi-fluorescence filter cube turret, barrier filter wheel, rear port unit, and future confocal/TIRF upgrades.	Requested to remove.	specific to one manufacturer.	**Non-Specific / User Requirement:** A dual-deck system is required for future upgradation, for the integration of a laser ablation unit/FRAP, and provisions for TIRF upgradation, so that the same microscope frame can be used for correlative study by combining different microscopy techniques on the same microscope platform. The upgradability for future-proofing and accommodating advanced techniques (confocal/TIRF) is a critical long-term requirement and should be maintained.
04	Sensor: ≥20 MP on a large sensor approximately full-frame (minimum ~35 × 23 mm) for maximal FOV utilization.	Sensor: ≥20 MP on a large sensor approximately 1 inch of sensor size	specific to one manufacturer.	**Accepted:** **Can be read as -** High-resolution, low-noise color CMOS camera. Sensor: 18-20 MP on a large sensor full frame for maximal FOV utilization.

3. Imaging & Processing Facility (Motorized Inverted Fluorescence Microscope with DIC, Color Camera and Software)

Sl. No.	Reference Document (Required Specifications)	Query Raised by - Leica	Query	Response from IITI
01.	**Controls:** Body-mounted shuttle switches/function buttons (or equivalent) for filter turret rotation and fluorescence/transmitted mode selection. Intermediate magnification changer: 1.5× (user-exchangeable to 2×), There should be an active right side port also to attach 2 cameras at a time.	Controls: Please remove this point.	For fluorescence microscopy people normally don't use any additional optical component which will unnecessarily decrease the signal further without any significant advantage.	**No Change / User Requirment** The Body-mounted controls provide immediate, tactile control for rapid manual work. The Intermediate Magnification changer is necessary for optimal camera pixel sampling (Nyquist). A Dual Camera Port on one side is necessary to perform simultaneous multi-channel imaging (for e.g., fast calcium imaging on one camera, and a second slower fluorescent marker on the other).

02	**Imaging FOV:** Internal optical path supporting 22 mm FOV or better at the imaging port for large-format cameras. Minimum 3 or more manual camera ports (two side, one rear) with selectable light path splits: eyepiece 100%, left 100%, right 100%, or eyepiece 20%/left 80% or eyepiece 20%/right 80%. Motorized light path selection for visual and camera imaging	Imaging FOV: Internal optical path supporting 19-22 mm FOV or better at the imaging port for large-format cameras. The frame should have option to upgrade for additional ports in future for additional cameras.	Presently for one camera-based system asking for 3 ports is unnecessary and not justifiable. In future if the system gets upgraded to multiple cameras, that time those additional ports can be integrated.	**No Change / User requirement:** **22 mm FOV or better** Minimum 3 ports are required for multi-channel imaging and future-proofing. This allows simultaneous connections of High-speed sCMOS (fluorescence), Color camera (brightfield/staining), and Point Detector/Specialized Sensor (TIRF/NIR). The selectable light path splits (for e.g.,100 to the camera) are crucial to maximize Signal-to-Noise Ratio (S/N ratio) for low-light imaging. Reduced field of view decreases the available scan area, which in turn lowers statistical accuracy in data analysis.
03	**Stage:** Manual X–Y stage with stage plate 250 × 250 mm or better; travel 110 mm (X) × 70 mm (Y) or better. Include universal sample holders (ring holders, 96-well plate clamps, slide/dish holders).	Stage: Manual X–Y stage with stage plate; travel 110 mm (X) × 70 mm (Y) or better. Include universal sample holders (ring holders, 96-well plate clamps, slide/dish holders).	Different companies have different stage size. For user the parameter that matters is the travel range of the stage, not the size of the stage plate. So request to remove that part.	**Acceptable:** **Can be read as:** Manual X–Y stage with stage plate; travel 110 mm (X) × 70 mm (Y) or better. Include universal sample holders (ring holders, 96-well plate clamps, slide/dish holders).
04	**Double-deck upgrade:** Upgradable to double-deck to increase infinity space for devices such as a second epi-fluorescence filter cube turret, barrier filter wheel, rear port unit, and future confocal/TIRF upgrades.	Double-deck upgrade: Should be upgradable to doubledeck/infinity port to increase infinity space for devices such as a second epi-fluorescence filter cube turret, barrier filter wheel, rear port unit, and future confocal/TIRF upgrades.	Different companies have different mechanism to include additional optical components for upgrades. Some uses additional deck, some uses additional port, the change is requested to make it more general.	**Accepted:** **Can be read as**: Microscope should be Upgradable to double-deck/infinity port to have Dual Deck (dual turret) or infinity port mechanism in future for future upgrades, such as a second epi-fluorescence filter cube turret, barrier filter wheel, rear port unit, and for the integration of a laser ablation unit/FRAP, and provisions for TIRF upgradation.
05	**Fluorescence illuminator:** LED system with ≥4 independently controllable wavelengths covering DAPI (~385 nm), FITC/GFP (~475 nm), TRITC/Cy3 (~550 nm), and Cy5 (~620 nm) regions.	Fluorescence illuminator: LED system with at least 3/4 independently controllable wavelengths covering DAPI (~385 nm), FITC/GFP (~475 nm), TRITC/Cy3 (~550 nm), and Cy5 (~620 nm) regions.	The LED model Leica provides has to independently controllable LEDs, but provides all the wavelengths asked here, as for the Red and Far-red it uses one broad-band LED and the Blue and Green are separate and have relatively narrow bands.	**Accepted** **Can be read as:** Fluorescence illuminator: LED system with at least 3-4 independently controllable wavelengths covering DAPI (~385 nm), FITC/GFP (~475 nm), TRITC/Cy3 (~550 nm), and Cy5 (~620 nm) regions.

06	**20X Objective**: Plan Fluor/Apochromat, NA ≥0.45, extralong WD (6.9–8 mm), cover glass correction collar 0–2 mm.	20X Objective: Plan Fluor/Apochromat, NA ≥0.40, extralong WD (6.9–8 mm), cover glass correction collar 0–2 mm.	Request to make it more generalized numbers, so that we can also participate.	**No Change / User Requirement:** 20X objective: Plan Fluor/Apochromat, NA ≥0.45, extra-long WD (6.9–8 mm), cover glass correction collar 0–2 mm. *(The higher the NA better the resolution).*
07	**Camera:** High-resolution, low-noise color CMOS. **Sensor:** ≥20 MP on a large sensor approximately full-frame (minimum ~35 × 23 mm) for maximal FOV utilization.	Camera: High-resolution, high-sensitivity Monochrome CMOS Camera with an 80% peak QE at 500 nm (sCMOS or CCD equivalent) Sensor: ≤ 20MP or better resolution on a large sensor approximately full frame for maximal FOV utilization.	The camera specification is very specific to a particular one model of a particular one company, changes requested to make it more generalized so that everyone can participate.	**Accepted** **Can be read as:** Camera: High-resolution, low-noise color CMOS. Sensor: 18-20 MP on a large sensor full frame for maximal FOV utilization.

4. **High-End Optical Microscope NIT Kurukshetra**
(Inverted Fluorescence Microscope with DIC, Colour Camera and Software)

Sl. No.	Reference Document (Required Specifications)	Query Raised by - DSS	Query	Response from IITI
1.	**Controls:** Body-mounted shuttle switches/function buttons (or equivalent) for filter turret rotation and fluorescence / transmitted mode selection. Intermediate magnification changer:1.5×(exchangeable to 2×). There should be an active right side port also to attach 2 cameras at a time.	Body-mounted shuttle switches/function buttons (or equivalent remote pod with screen) for filter turret rotation and fluorescence/transmitted mode selection. Intermediate magnification changer: 1.5×/1.6X (exchangeable to 2×). There should be an active right side port also to attach 2 cameras at a time.	The exchangeable 2X magnification changer is only offered by a single company.	**Accepted** **Can be read as:** Body-mounted shuttle switches/function buttons (or equivalent remote pod with screen) for filter turret rotation and fluorescence/transmitted mode selection. Intermediate magnification changer: 1.5×/1.6X (exchangeable to 2×). There should be an active right side port also to attach 2 cameras at a time.

2	**Imaging FOV:** Internal optical path supporting 22mm or better FOV at the imaging port for large-format cameras. Minimum 3 or more manual camera ports (two side, one rear) with selectable light path splits: eyepiece 100%, left 100%, right 100%, or eyepiece 20%/left 80% or eyepiece 20%/right 80%. Motorized light path selection for visual and camera imaging.	Imaging FOV: Internal optical path supporting 22mm or better FOV at the imaging port for large-format cameras. Minimum 3 or more manual camera ports (two side, one rear /trinocular) with selectable light path splits: eyepiece 100%, left 100%, right 100%, or eyepiece 20-50%/ left 50-80% or eyepiece 20%/right 80%. Motorized light path selection for visual and camera imaging. Motorized light path selection for visual and camera imaging.	Our system can offer two side ports and one trinocular port. Please make the necessary changes to allow us.	**Accepted** **Can be read as:** Internal optical path supporting 22 mm FOV or better at the imaging port for large-format cameras. Minimum 3 or more manual camera ports (two side, one rear) with selectable light path splits: eyepiece 100%, left 100%, right 100%, or eyepiece 20%/left 80% or eyepiece 20%/right 80% or eyepiece 50%/left 50%. Motorized light path selection for visual and camera imaging.
3	**Condenser turret:** Manual turret with 6-7 positions or better, including modules for brightfield, DIC, and neutral density filters for intensity control. Must include Long Working Distance (LWD) Lens for System suitable for cell culture vessels (greater than 40mm or better).	Condenser turret: Manual turret with 4-7 positions or better, including modules for brightfield, DIC, and neutral density filters for intensity control. Must include Long Working Distance (LWD) Lens for System suitable for cell culture vessels (greater than 40mm or better).	The 6-7 position manual LWD condenser is offered by a specific company. The tender asks for 3 objectives with DIC attachments, so 4 condenser positions can offer DIC prisms for each objective and one empty slot for BF imaging. Hence, there is no need for the 5 and 6 position practically. Therefore, requesting to amend the point for a practical reason and allow us.	**No Change / User Requirement** A condenser turret with more positions provides the flexibility to add additional objective-specific DIC prisms in the future. A turret with fewer positions will limit future applications.
4	**Objective:** 10X Objective: Plan Apochromat, NA ≥0.45.	10X Objective: Plan Apochromat, NA ≥0.40.	Evident offers apochromatic XAPO 10X objective with excellent field flatness and chromatically corrected from 400-1000nm with a NA of 0.4 and WD of 3.1 mm.	**No Change / User Requirement** Compromising the NA directly affects the resolution and resolving power, and a longer working distance provides greater physical clearance between the objective and the sample, accommodating thick culture dishes, microfluidic chambers, and similar accessories.

5	**Image Sensor Type**: Large Format CMOS Sensor with a physical size of 35 mm diagonal or larger, designed for optimal wide Field of View (FOV) imaging. **Maximum Resolution:** Ultra-High Resolution: Capable of recording images at a minimum of 20 megapixels or better.	Image Sensor Type: Large Format CMOS Sensor with a physical size of 14-35 mm diagonal or larger, designed for optimal wide Field of View (FOV) imaging. Maximum Resolution: Ultra-High Resolution: Capable of recording images at a minimum of 8-10 megapixels or better.	The camera specs are limited to a single manufacturer. As per the asked objective magnification and resolution more than 10 mega pixel is scientifically required for fluorescence imaging.	**Non-Specific / User Requirment** Image Sensor Type: Large Format CMOS Sensor with a physical size of 35 mm diagonal or larger, designed for optimal wide Field of View (FOV) imaging. Maximum Resolution: Ultra-High Resolution: Capable of recording images at a minimum of 18-20 megapixels or better.
6	**Exposure Time:** Wide exposure range suitable for low-light fluorescence: Must be adjustable from 100 microseconds up to a minimum of 120 seconds or better.	Exposure Time: Wide exposure range suitable for low-light fluorescence: Must be adjustable from 24-100 microseconds up to a minimum of 15-120 seconds or better.	The tender spec asks for a camera from a particular company that needs very high exposure time as the camera sensitivity is very poor, hence by making the requested changes we will be able to offer a better sensitivity camera. Also, 120s exposure time not required for any kind of fluorescence / BF imaging with high performance or high sensitive cameras.	**Non-Specific / User Requirement** The vendor may offer better specifications if available, but the original specifications will remain unchanged.

4. High-End Optical Microscope NIT Kurukshetra
(Inverted Fluorescence Microscope with DIC, Colour Camera and Software)

Sl. No.	Reference Document (Required Specifications)	Query Raised by - Zeiss	Query	Response from IITI
1.	Controls: Body-mounted shuttle switches/function buttons (or equivalent) for filter turret rotation and fluorescence/transmitted mode selection. Intermediate magnification changer: 1.5× (exchangeable to 2×). There should be an active right side port also to attach 2 cameras at a time.	Requested to remove.	specific to one manufacturer.	**Acceptable** **Can be read as:** Body-mounted shuttle switches/function buttons (or equivalent remote pod with screen) for filter turret rotation and fluorescence/transmitted mode selection. Intermediate magnification changer: 1.5×/1.6X (exchangeable to 2×/in-built). There should be an active right side port also to attach 2 cameras at a time.

2	Minimum 3 or more manual camera ports (two side, one rear) with selectable light path splits: eyepiece 100%, left 100%, right 100%, or eyepiece 20%/left 80% or eyepiece 20%/right 80%. Motorized light path selection for visual and camera imaging		Minimum 2 or more manual camera ports (two side, one rear) with selectable light path splits: eyepiece 100%, left 100%, right 100%, or eyepiece 20%/left 80% or eyepiece 20%/right 80%. Motorized light path selection for visual and camera imaging	**No Change / User Requirement:** Three ports are often required for advanced imaging systems to simultaneously accommodate different detectors: a High-resolution scientific camera (e.g., sCMOS) for fast, low-light imaging; a Color camera for histological/brightfield work; and a Point detector (e.g., PMT or specialized sensor) for advanced techniques like TIRF Imaging or future Near-Infrared (NIR) detection. The ability to select the light path is crucial to optimize signal-to-noise ratio by ensuring 100% of the signal goes to the most sensitive camera for specific tasks (e.g., low-light fluorescence).
3	Double-deck upgrade: Should be upgradable to double-deck to increase infinity space for devices such as a second epi-fluorescence filter cube	Requested to remove.	specific to one manufacturer.	**Non-Specific / User Requirement:** A dual-deck system is required for future upgradation, for the integration of a laser ablation unit/FRAP, and provisions for TIRF upgradation, so that the same microscope frame can be used for correlative study by combining different microscopy techniques on the same microscope platform. The upgradability for future-proofing and accommodating advanced techniques (confocal/TIRF) is a critical long-term requirement and should be maintained.

4	Image Sensor Type: Large Format CMOS Sensor with a physical size of 35 mm diagonal or larger, designed for optimal wide Field of View (FOV) imaging.	Image Sensor Type: Large Format CMOS Sensor with a physical size of 17.5 mm diagonal or larger, designed for optimal wide Field of View (FOV) imaging.	specific to one manufacturer.	**Non-Specific / User requirement:** The physical size of the camera sensor (e.g., 35 mm diagonal or large format) is directly linked to the Field of View (FOV) captured. Modern microscope optics project a wide, highly corrected image circle. To maximize throughput (samples imaged per unit time) in applications like High-Content Screening (HCS), the camera sensor must be large enough to capture the entire image circle without vignetting or wasting the objective's corrected area. This maximizes the biological information captured per image and reduces overall experiment time.
5	Color/Monochrome Mode: Camera Unit should be capable of acquiring both Color (for brightfield/staining) and Monochrome (for high-sensitivity fluorescence) images.	Requested to remove.	specific to one manufacturer.	**Non-Specific / User Requirement:** A single system must support two distinct types of applications: 1. Histology/Brightfield: Requires a Color camera to accurately capture stained tissues (e.g., H&E). 2. Fluorescence/Low-Light: Requires a Monochrome (Black and White) camera.

4. High-End Optical Microscope NIT Kurukshetra
(Inverted Fluorescence Microscope with DIC, Colour Camera and Software)

Sl. No.	Reference Document (Required Specifications)	Query Raised by - Leica	Query	Response from IITI
01.	**Controls:** Body-mounted shuttle switches/function buttons (or equivalent) for filter turret rotation and fluorescence/transmitted mode selection. Intermediate magnification changer: 1.5× (user-exchangeable to 2×), There should be an active right side port also to attach 2 cameras at a time.	Controls: Please remove this point.	For fluorescence microscopy people normally don't use any additional optical component which will unnecessary decrease the signal further without any significant advantage	**No Change / User Requirment** The Body-mounted controls provide immediate, tactile control for rapid manual work. The Intermediate Magnification changer is necessary for optimal camera pixel sampling (Nyquist). A Dual Camera Port on one side is necessary to perform simultaneous multi-channel imaging (for e.g., fast calcium imaging on one camera, and a second slower fluorescent marker on the other).

02	**Imaging FOV:** Internal optical path supporting 22 mm FOV or better at the imaging port for large-format cameras. Minimum 3 or more manual camera ports (two side, one rear) with selectable light path splits: eyepiece 100%, left 100%, right 100%, or eyepiece 20%/left 80% or eyepiece 20%/right 80%. Motorized light path selection for visual and camera imaging	Imaging FOV: Internal optical path supporting 19-22 mm FOV or better at the imaging port for large-format cameras. The frame should have option to upgrade for additional ports in future for additional cameras.	Presently for one camera-based system asking for 3 ports is unnecessary and not justifiable. In future if the system gets upgraded to multiple cameras, that time those additional ports can be integrated.	**No Change / User requirement:** **22 mm FOV or better** Minimum 3 ports are required for multi-channel imaging and future-proofing. This allows simultaneous connections of High-speed sCMOS (fluorescence), Color camera (brightfield/staining), and Point Detector/Specialized Sensor (TIRF/NIR). The selectable light path splits (for e.g.,100 to the camera) are crucial to maximize Signal-to-Noise Ratio (S/N ratio) for low-light imaging. Reduced field of view decreases the available scan area, which in turn lowers statistical accuracy in data analysis.
03	**Double-deck upgrade:** Should be upgradable to double-deck to increase infinity space for devices such as a second epi-fluorescence filter cube turret, barrier filter wheel, rear port unit, and future confocal/TIRF upgrades.	Double-deck upgrade: Should be upgradable to doubledeck/infinity port to increase infinity space for devices such as a second epi-fluorescence filter cube turret, barrier filter wheel, rear port unit, and future confocal/TIRF upgrades.	Different companies have different mechanism to include additional optical components for upgrades. Some uses additional deck, some uses additional port, the change is requested to make it more general.	**Accepted:** **Can be read as:** Microscope should be Upgradable to double-deck/infinity port to have Dual Deck (dual turret) or infinity port mechanism in future for future upgrades, such as a second epi-fluorescence filter cube turret, barrier filter wheel, rear port unit, and for the integration of a laser ablation unit/FRAP, and provisions for TIRF upgradation.
04	**Fluorescence illuminator:** LED system with ≥4 independently controllable wavelengths covering DAPI (~385 nm), FITC/GFP (~475 nm), TRITC/Cy3 (~550 nm), and Cy5 (~620 nm) regions.	Fluorescence illuminator: LED system with at least 3/4 independently controllable wavelengths covering DAPI (~385 nm), FITC/GFP (~475 nm), TRITC/Cy3 (~550 nm), and Cy5 (~620 nm) regions.	The LED model Leica provides has to independently controllable LEDs, but provides all the wavelengths asked here, as for the Red and Far-red it uses one broad-band LED and the Blue and Green are separate and have relatively narrow bands.	**Accepted** **Can be read as:** Fluorescence illuminator: LED system with at least 3-4 independently controllable wavelengths covering DAPI (~385 nm), FITC/GFP (~475 nm), TRITC/Cy3 (~550 nm), and Cy5 (~620 nm) regions.

05	**Objectives:** 10X Objective: Plan Apochromat, NA ≥0.45. • 20X Objective: Plan Apochromat, NA ≥0.70 . • 40X Objective: Plan Apochromat, NA ≥0.95.	10X Objective: NA ≥0.25. • 20X Objective: NA ≥0.40. • 40X Objective: NA ≥0.60.	None of the objectives are actually compatible with cell culture vessels and have enough working distance to suit that. Therefore, proposing a complete new set of objectives will satisfy the requirement better for the system.	**No Change / User Requirement** The higher the NA better the resolution, so we would like to keep the NA higher to achieve better results. We request that you quote better NA objectives.
06	**Maximum Resolution:** Ultra-High Resolution: Capable of recording images at a minimum of 20 megapixels or better. **Exposure Time:** Wide exposure range suitable for lowlight fluorescence: Must be adjustable from 100 microseconds up to a minimum of 120 seconds or better.	Maximum Resolution: Ultra-High Resolution: Capable of recording images at a maximum of 20 megapixels or better. Exposure Time: Wide exposure range suitable for low-light fluorescence: Must be adjustable from 100 microseconds up to a minimum of 1 second or better.	The camera specification is very specific to a particular one model of a particular one company, changes requested to make it more generalized so that everyone can participate.	**Partially accepted / User requirement:** **Can be read as**: Maximum Resolution: Ultra-High Resolution: Capable of recording images at a minimum of 18-20 megapixels or better. Wide exposure range suitable for lowlight fluorescence: Must be adjustable from 100 microseconds up to a minimum of 120 seconds or better.
07	**Software Features:** Software must include the following functionalities: 4D Multidimensional Imaging (Time-lapse, Z-series) Multichannel Imaging (FL/DIC/Phase), Snap-Shot, Movie Capture, 2D Image Stitching/Tiling, Linear Measurements, Annotations, and Report Generator, Image Arithmetic, Intensity Measurement (ROI), Binary Layers, Manual Measurement tools and Macro Automation.	Software Features: Software must include the following functionalities: Multidimensional Imaging Multi-channel Imaging (FL/DIC/Phase), Snap-Shot, Movie Capture, Linear Measurements, Annotations, and Report Generator, Image Arithmetic, Intensity Measurement (ROI), Binary Layers and Manual Measurement tools.	With a manual microscope, with manual z-focus and manual stage, Time-lapse, Z-series and stitching/tiling experiments are not possible. Therefore request to remove those points.	**No Change / User requirement:** Software must include the following functionalities: 4D Multidimensional Imaging (Time-lapse, Z-series), Multichannel Imaging (FL/DIC/Phase), Snap-Shot, Movie Capture, 2D Image Stitching/Tiling, Linear Measurements, Annotations, and Report Generator, Image Arithmetic, Intensity Measurement (ROI), Binary Layers, Manual Measurement tools, and Macro Automation.

All prospective/willing bidders are requested to take note of this report as part of the Tender document. All other terms and conditions of the tender remain unchanged.

Assistant Registrar (R&D MMS)

सहायक कुलसचिव
(अनुसंधान एवं विकास सामग्री प्रबंधन विभाग)
Assistant Registrar
(R&D-Materials Management Section)