भारतीय
प्रौद्योगिकी
संस्थान
काशी हिन्दू विश्वविद्यालय

IIT INDIAN INSTITUTE OF TECHNOLOGY
BANARAS HINDU UNIVERSITY

भैषजकीय अभियांत्रिकी एवं प्रौद्योगिकी विभाग

DEPARTMENT OF PHARMACEUTICAL ENGINEERING & TECHNOLOGY
Indian Institute of Technology (BHU), Varanasi - 221005
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No. IIT/PH/2018-19/366 Dated: 05.12.2018

CORRIGENDUM

Brief Description of Procurement: Pre-Clinical In- vivo Imaging System for Small Animals: 1 complete Unit

Bid Ref.: IIT (BHU)/PH/FY/2018-19/QTN/M/58 Dated: 17.11.2018

A. Modification in Specification

Description /Technical Specification - Annexure 1
Attached separately

Technical Compliance Statement - Annexure 2
Attached separately as Annexure 2 with following changes

Se. No.	Tender Terms/ Specification	Modified Tender Terms/ Specification
1.	Page No 31: Se. No.: 07 : Real effective imaging pixel must be minimum 4 MP or better	Real effective imaging pixel must be minimum 2030 x 2030 or better
2.	Page No 31: Se. No.: 12 : Minimum FOV down to 2 to 20 micron	Minimum FOV down to 20 micron

B. CDEC Certificate

CDEC will be provided at the time of custom clearance by IIT (BHU).

C. Bid submission end date and Bid opening date:

The Bid submission end date has been extended **till 15.12.2018 02:00 p.m.** and bid opening date will be **17.12.2018 03:00 p.m.**

S. Hemalatha 5/12/18
Head of the Department
विभागाध्यक्ष / Head
भैषजकीय अभियांत्रिकी एवं प्रौद्योगिकी विभाग /
Department of Pharmaceutical Engineering & Technology
भारतीय प्रौद्योगिकी संस्थान / INDIAN INSTITUTE OF TECHNOLOGY
(बनारस हिन्दू विश्वविद्यालय) / (BANARAS HINDU UNIVERSITY)
वाराणसी-२२१००५ / Varanasi-221005

SL. NO.	Name of Items	Description /Technical Specification
1	**Pre-Clinical In-vivo Imaging System for Small Animals** System should be of latest generation fully automated In-Vivo small animal multimodality for mice and rats with additional in vitro imaging capability.	**Specifications:** 1. **In- vivo Imaging System for Small Animals** Should be a complete system inclusive of light tight cabinet, CCD or other high tech, camera system, high efficiency excitation and emission filters, sample stage (Heated 20 to 40°C) and computer work station, and other standard and essential accessories to work for small animals like mice and rat. 2. A high efficient and sensitive In-Vivo Imaging system should be ideal for the non-invasive monitoring of disease progression. Capability of detection, localization and quantification of dynamic bioluminescence and fluorescence optical singles, in vivo and also in vitro with full spectrum imaging capabilities from blue to near-infrared in bioluminescence and fluorescence. It must have selection of detection wavelength from minimum 400 nm to 900 nm or better. It must also be capable for Radioisotopic Cerenkov Imaging. System should be able to detect near infrared fluorescent probes and should be compatible with 96 and 384 well plates. System should be capable of imaging multiple fluorophores with capability of spectral un-mixing. 3. System should have very high sensitive CCD Camera cooled Grade 1 CCD or very high tech camera & sensor system, which should provide minimum detectable radiance of at least 70 photons/s/sr/sq.cm or better. Real effective imaging pixel must be minimum 2030 x 2030 or better, should have Quantum Efficiency/Photon Efficiency minimum 85% for 500-700nm or full range. Sensor technology should also be capable to collect information at a high frequency in order to resolve biologically relevant light fluctuations. 4. System should have Maximum Optical field of View (FOV) Approx 23x23 cm or larger & minimum Field of View must be go down to approx 8 x 8 cm or smaller & it should be able to provide Image Pixel Resolution for maximum FOV 50 to 110 micron and for minimum FOV down to 20 micron to cover full body to cell size, In vivo and in vitro. 5. For Fluorescence illumination source should be either lasers or NIRF Optimized 150W long lasting Tungsten or Halogen lamp, should have adequate filters, which should be able to distinguish at least 3 to 5 optical signatures with different emission wavelengths from a single scan/ image of whole animal in vivo / in vitro tissue imaging in petri plates /slides etc. 6. System should be able to scan multiple animals, upto 5 or above 5 at a time with high throughput and fast screening. 7. Image acquisition and analysis software suitable for fluorescence, bioluminescence and Cerenkov studies licensed for in-vivo and in-vitro studies. Software able to spectrally unmix multiple reporters within same animal based on Compute Pure Spectra. In other words software should include capability for multicolour fluorescence imaging with capability of spectral separation or un-mixing. It should be proved with perpetual license. Software should be user friendly and allow us to analyze our research quickly and easily. 8. Life time software upgrade and perpetual support. 9. For multimodality, system should be compatible with other imaging modalities (eg.MRI, CT, PET) via DICOM compatible Export of data or any other compatible device. 10. System should be capable to image real time and have dynamic imaging capabilities for weak BLI/FLI signals. i.e should detect signals (both bioluminescence / fluorescence) from very first seconds of the experiment and can be stopped at any time. It should continuously display and be capable of kinetic recording of dynamic signals to study rapid and transient biological phenomenon makes it possible to image optical signals as a function of time. 11. The system should preferably have zoom capability of 1X to 15X without loss of sensitivity. 12. System's work station must be Intel(R) 7th generation Intel® Core i7-7700 (Quad cor 3.6GHz, 4.2GHz Turbo 8Mb with HD360 graphics. Class 40 M2. PCIe NVMe 256Go SATA SSD Drive.500Go 3.5 inch ATA seral Drive (7,200 rpm) Hard drive 24 inch TFT high resolution monitor, CD /DVD/combo reader/writer, or better compatible UPS (minimum 3KVa) with minimum 1 hr backup or better. 13. System should operate on 220V / 50Hz and must come with High quality Servo controlled on line UPS or voltage stabilizer. 14. System must be minimum 3-year standard warranted and vendor must provide minimum 2 years after warranty free services. 15. Vendor must provide satisfactory training on both operations of the system and standard maintenance by user level. Complete installation and application training is company's responsibility. 16. Integrated gas Anesthesia: Gas anesthesia ports and 3-5 position manifold within imaging chamber with gas flow controller to maintain anesthesia during imaging sessions. Complete working configuration inclusive of hardware/software, tubing, valves. 17. The system capable of performing 3D image re-construction will be preferred. **Optional Accessories:** 1. Upgradable or capable of 3D computed tomography with associated modules. Imager should be able to do 3D optical tomography for fluorescence and bioluminescence. Software should include capability of viewing the animals in different angles and to also create a cross sectional image planes. 2. It must also allow or upgradable to Image preferably non anesthetized animal imaging to avoid animal stress and spare time, ideal for calcium reporters. **NOTE:** **1. The system should be completely upgradable in future.** **2. Price should be quoted in INR/Foreign currency as F.O.R, IIT (BHU), Varanasi**

Annexure- 2

TECHNICAL COMPLIANCE STATEMENT

(To be submitted by bidder duly filled)

SL No.	Technical Requirement	YES/NO
1.	Light tight cabinet, CCD or other high tech camera system	
2.	Capability to detect bioluminescence and fluorescence optical singles, in vivo and also in vitro from minimum 400 nm to 900 nm	
3.	Capable for Radioisotopic Cerenkov Imaging	
4.	Compatibility with 96 and 384 well plates	
5.	Imaging multiple fluorophores with capability of spectral un-mixing	
6.	Minimum detectable radiance of at least 70 photons/s/sr/sq.cm	
7.	Real effective imaging pixel must be minimum 2030 x 2030 or better	
8.	Quantum Efficiency/Photon Efficiency minimum 85% for 500-700nm or full range	
9.	Maximum Optical field of View (FOV) Approx 23x23 cm or larger	
10.	Minimum Field of View approx 8 x 8 cm or smaller	
11.	Image Pixel Resolution for maximum FOV 50 to 110 micron	
12.	Minimum FOV down to 20 micron	
13.	Fluorescence illumination source either lasers or NIRF Optimized 150W long lasting Tungsten or Halogen lamp	
14.	Able to scan multiple animals, upto or above 5 at a time	
15.	Image acquisition and analysis software suitable for fluorescence, bioluminescence and Cerenkov studies.	
16.	Software able to spectrally unmix multiple reporters within same animal	
17.	Dynamic imaging capabilities for weak BLI/FLI signals	
18.	Integrated gas Anesthesia	

S. Herath 5/12/18

Signature of the Authorized Official with Seal