

Pre bid meeting held on 5th March 2020

Chapter 4: UPLC-QTOF(LC-HRMS)-01 unit funded under National Centre for Pharmacoengineering (State-of-the-art-facility), Department of Science and Technology, Government of India

Amended Technical Specifications

Specification should be available on vendor's website. System should be compatible with nano LC without change any hardware and software in Future. All submitted technical documents' data should be available on vendor's public website. All the quoted components should have proper part number.

UPLC-QTOF(LC-HRMS)-01		
S. No.	Specification	Amended Specifications
•	LC System Hardware Specification: LC system should be fully integrated MS interfacing capability. Both LC and MS should be from same manufacturer. UPLC system capable to run <2µm particle size columns.	No Change
Pump:		
•	Pump should be Quaternary Gradient Pump with Vacuum degassing capability of solvents.	No Change
•	Dual Piston in series with active damping.	No Change
•	Should have Flow Rate Range: 0.01 to 2.0 mL/min	No Change
•	Should have Maximum Pressure: 1000 bar/15000PSi or better	No Change
•	System should have gradient Delay Volume < 400 µL or better.	No Change
Auto sampler:		
•	Sample Capacity 2 Trays, Standard or deep 96-well & 96x 1.5 mL vials.	No Change
•	Auto sampler with chiller (4 – 40 deg. C)	No Change

•	Injection Volume: Range 0.1 to 50.0 µL or better	No Change
•	Injection Volume Precision: RSD ≤ 0.5% or better.	No Change
•	Carryover: Less than 0.003% (for 10 ppm standard sample).	No Change
•	Column compartment: Column Oven: Room Temperature to 80°C or better with temperature stability ± 0.1°C.	No Change
LC detection system : PDA/DAD		
•	Detector type: 512/1024 elements diode array or better	No Change
•	Wavelength range: 190 – 800 nm or better.	No Change
•	Wavelength accuracy: within 1 nm.	No Change
•	Flow cell: volume should be ≤ 500 nL	No Change
Mass spectrometer/QTOF Analyzer System Hardware Specification Ion source:		
•	System should have dedicated/combined or equivalent technology for ionization source (ESI) & (APCI) to cater broader range of Applications and APPI source or equivalent and probe for direct analysis of solid samples as optional.	No Change
•	Source Interface should maintain cleanliness of ion optics and capable of handling large batches of complex samples & Cleaning of source should be done without venting the vacuum system.	No Change
•	Sample introduction must be possible either directly or combined with suitable liquid chromatographic system automatically through integrated fluidics or via external syringe pump.	No Change
•	Source must be able to handle broader flow rate ranging from 0.1 to 1 ml or better	No Change

•	Software control gas flow and heating elements	No Change
•	Suitable accessory for sample introduction by direct infusion in the system must be supplied.	No Change
•	System should have latest technology of ion focusing to the analyser.	No Change
•	Mass Analyzer should be equipped with physical quadrupole analyzer and collision cell followed by high resolution Time of flight or equivalent mass analyzer system/ hybrid quadrupole ion trap. System should have CID for fragmentation & MS/MS, with efficient ion transmission using the latest technology.	No Change
•	Quadrupole Mass Range: 50 m/z to 10000 m/z or Better	Quadrupole Mass Range: 50 m/z to 30000 m/z or better
•	A collision cell for fragmentation purposes should be available. System must have a better ion optics with Collision Cell to eliminate cross talk and enable for optimal MS/MS performance at high data acquisition rates.	No Change
•	The Desolvation Temperature must be at least 400°C or higher.	No Change
•	Vacuum system: All accessories required for the proper functioning of the vacuum system should be supplied Suitable software controlled vacuum system to operate and maintain the instrument at highest level should be provided.	No Change
•	Gas Generator: Nitrogen gas Generator should be supplied with the system along with the oil free compressor without any troubles and appropriate capacity reservoir which should be sufficient enough to deliver the gases (purity > 99.999%) required to run the system. Generator should have three years warranty.	Gas Generator: noise free Nitrogen gas Generator should be supplied with the system along with the oil free compressor without any troubles and appropriate capacity reservoir which should be sufficient enough to deliver the gases (purity > 99.999%) required to run the system with 70L/min capacity. Nitrogen gas Generator and UPS with battery should have three years warranty from the date of installation.
•	Computer work station: One branded work station Wi-Fi enabled Desktop desk top computer processor intel core i7 @ 3.40 GHz Ram 64 GB, Memory 10 TB, Screen 27 inch or more, DVD	Computer work station: One branded work station Wi-Fi enabled Desktop desk top computer processor intel core i7 @ 3.40 GHz Ram 64 GB, Memory 10 TB, Screen 27 inch or

	<p>write drive, key board and mouse with laser jet multi-functional printer with high speed USB, wireless connect, up to 26 pages per minute and toner capacity 1200 pages or more for running the equipment and software.</p> <p>Vendor may also quote all in one computer with same specifications with licensed mass software</p> <p>License version of windows professional OS & MS-Office professional and driver with original CD.</p>	<p>more, DVD write drive, key board and mouse with laser jet multi-functional printer with high speed USB, wireless connect, up to 26 pages per minute and toner capacity 1200 pages or more for running the equipment and software.</p> <p>Vendor may also quote all in one computer with same specifications with licensed mass software</p> <p>License version of latest windows professional OS & latest MS-Office professional and driver with original CD.</p> <p>License version of adobe creative cloud</p>
Performance Specifications:		
	<p>Acquisition modes: Mass spectrometer should have the following scan options:</p> <ol style="list-style-type: none"> 1. MS scan 2. MS/MS Product ion scan 3. Ionization mode switching (positive to negative or vice versa). 4. Simultaneous full scan and MRM or better Detection. 5. Fast DAD/MS to MS/MS. 6. Automated MS to MS/MS Switching, 7. Identification and quantification of compounds or complex molecules at high resolutions 	No Change
	<p>Mass measurement accuracy: The mass accuracy of the system should be minimum 1 ppm, with both internal & external calibration standards for both MS& MS/MS modes on 10 consecutive repeat measurements.</p>	No Change
	<p>Dynamic range: 4 orders of magnitude or better</p>	No Change
	<p>Mass resolution: The Resolution of system must be better than 40000 FWHM (Full Width Half Maximum). 1.0 ±0.1 amu resolution over the entire mass range for quantitation.</p>	No change

<ul style="list-style-type: none"> • 	<p>MS sensitivity: Sensitivity at Lower detection and highest sensitivity in both ESI & APCI Mode with high sensitivity for qualitative and quantitative analysis.</p> <p>Supplied system should specify sensitivity for standard injected on column.</p> <p>The best sensitivity achievable with instrument must be 1500:1 or higher in 1pg reserpine /standard in all modes of analysis along with conc. of the standards and analytical conditions used in experiment MS and MS/MS mode</p>	<p>No Change</p>
<ul style="list-style-type: none"> • 	<p>Scan speed should have 30 spectra per sec or better in MS mode and 30 spectra per sec or better in MS/MS mode</p>	<p>No Change</p>
<p>Software:</p>		
<ul style="list-style-type: none"> • 	<p>Suitable software for operating both – LC and QTOF system should be provided.</p>	<p>No Change</p>
<ul style="list-style-type: none"> • 	<p>LC system should be fully integrated MS interfacing capability.</p>	<p>No Change</p>
<ul style="list-style-type: none"> • 	<p>LC and MS QTOF should be from the same manufacturer.</p>	<p>No Change</p>
<ul style="list-style-type: none"> • 	<p>The software should have capabilities to perform the following functions: Automated mass calibration, resolution, sensitivity check should be performed by software. Software tools for addressing Screening, Component Identification & Structural Elucidation workflows. The data processing software must incorporate an elemental composition calculator as standard. Included into the calculator must be algorithms for isotope pattern modelling that allow data interpretation of actual isotope patterns. A goodness of fit from actual to theoretical isotopes must be included. The ability to filter out incorrect elemental composition calculations.</p>	<p>No Change</p>
<ul style="list-style-type: none"> • 	<p>5 Nos licences for data processing / interpretation.</p>	<p>No Change</p>
<ul style="list-style-type: none"> • 	<p>Automatic library searching against free and</p>	<p>No Change</p>

	commercially available libraries.	
•	A commercial library more than 5,00,000 compounds including plant, human metabolomics, proteomics and lipidomic should be supplied by the supplier along with work station.	<i>A commercial library more than 5,00,000 compounds including plant, human metabolomics, lipidomics and lipidomic should be supplied by the supplier along with work station. MPP pathway software should be quoted along with system. The system should include complete proteomics analysis tool for protein identification, characterisation, quantification, and comparing data across multiple data across multiple experiment runs.</i>
•	Necessary software for metabolite, polymer, oligomer and organic Targeting mass screening, for presence/absence/confirmation of large number of compound in complex mixtures. Automatic quantification and reporting of acquired samples. Pesticide ratio analysis, toxin analysis, antibiotic and pharma compounds analysis	No Change
•	Provision to identify and characterize the drug metabolites	No Change
•	De convolution software shall be quoted.	No Change
•	System should have real time dynamic background subtraction for identifying trace level metabolites even in the presence of high abundant one.	No Change
Accessories:		
•	Pre requisite for MS: Calibration kit and any other gas cylinder for the working of the system shall be provided minimum one number with all accessories such as regulator; cylinder cage or Bracket etc. should be supplied and commissioned	No Change
•	Demonstration: Demonstration and Training on system to our Lab personal at site to be incorporated, responsibility of the supplier for training of the lab personnel at supplier	No Change

	<p>site/installation site.</p> <p>The model offered by the vender should have capability to demonstrate the above mention parameter like fast LC, high resolution, high mass accuracy in one single run.</p>	
•	Training Free of cost at site minimum 3 weeks training for operating instrument at the time of installation.	Training Free of cost at site with minimum 2 weeks training for operating instrument at the time of installation.
•	There will be two trainings, installation training and after few months advanced application training. Apart from these two, there will be application training every six months (till warranty period) on a mutually convenient date.	<i>There will be 16 days' trainings after installation till the warranty period for advanced application as per NIPERG requirement at mutually convenient date. For above trainings, single visit for minimum of two days training may be quoted as optional item.</i>
•	<p>Instrument qualification should be quoted</p> <p>Installation certificate will be issued only after satisfactory working of the instrument (Demo of all the modules) & onsite training. The instrument will consist of Ion source API (ESI /APCI), mass analyzers (Quadruple Time of flight / hybrid quadrupled ion trap MS-MS or equivalent system), data analyzing system and Nitrogen generator.</p>	No Change
•	UPLC waste reservoir 2 numbers: Capacity up to 8-10 liters, compatible for storage of polar and non-polar solvents. Should be supplied with 30 meters connecting tube	No Change
•	Wrist action shaker 01 number of wrist action shaker should be quoted along with system. This should be able to shake the 04 sample of 500 mL at a time.	No Change
•	<p>LC columns and accessories:</p> <p>➤ LC columns: C18 (6 (half with 1.8-micron size and half with 3-micron size)), C8 column (05), HILIC (05), Phenyl hexyl (05), Cyano column (05), DAB column (05), Normal Silica columns (05), Pentafluorophenyl with TMS endcapping columns (05), 3.5-μm particle 4.6 \times 150 mm X bridge amide column</p>	No Change

	(05)and CSH column (05) with ≤ 2 micron particle size should be provided. Guard column should also be quoted for all the columns.	
•	<ul style="list-style-type: none"> HRMS vials (2000 no.), glass inserts (150μL-2000 numbers) and recovery vials with cap and septa (2000 numbers each-, for low volume sample (2000 no.) each. 	No Change
•	<ul style="list-style-type: none"> Glass inserts should be compatible with HRMS and Triple quadrupole vials. 	glass inserts with bottom spring (150 μ L-2000 numbers) and recovery vials with cap and septa (2000 numbers each-, for low volume sample (2000 no.) each.
•	<ul style="list-style-type: none"> MS grade solvents: ACN (40L), Methanol (40L), Toluene (5L), IPA (30L) 	<ul style="list-style-type: none"> No change
•	<ul style="list-style-type: none"> ➤ Formic acid (2X100 ml), Ammonium formate (2X100 g); Ammonium acetate (2x 100g), 0.1% formic acid (2000mL), 0.1% Acetic Acid (2000mL), Ammonia solution for pH adjustment (1000mL), ethyl acetate (05 litre), acetone (05 litre), and trifluoroacetic acid (250 mL) ➤ Solid phase extraction C18 cartridges (2000 no.) ➤ Vacuum manifold (01) with vacuum pump (01) for solid phase extraction dedicatedly. ➤ Sterile plastic syringe 1ml and 2ml (2000 no. each) ➤ Syringe filters 0.22 micron 2000 should be quoted. (500 no. PTFE for non-sterile, and 500 no. PVDF for non-sterile, 1000 PVDF for sterile=Total of 2000) ➤ Capillary wire (charged)-04 ➤ Glass solvent filtration assembly (capacity 1 Liter with 47 mm diameter filter size or equivalent should be quoted along with the system. Filter papers for mobile phase filtration should be quoted as per filtration assembly diameter. (20 packets/total 2000 no. filter papers)) ➤ Solvent bottles (10 no.=500 ml, 10 no.= 1L, 10 no.=250mL and 10no.=100mL) ➤ Branded Micropipette with stand each (0.5-10 μL, 100-1000μL, 20-200μL and 10-100μL) ➤ Falcon tubes (15 mL and 30mL) 2000 no. 	No Change

	<p>Each</p> <ul style="list-style-type: none"> ➤ Extraction Plate Manifold KITB should be quoted including manifold 96 well plate, collection plate 1mL (100 numbers), Cap Mat, PTFE/Silicone 96 WS PRE-SL 5/P, tray reservoir, Vacuum Pump, 240V 50Hz, Oasis μElution Sorbent Selection Plate, Oasis® HLB μElution Plate for the low volume samples. ➤ Solvent will be arranged by supplier for the smooth demonstration and qualification of the system. <p>Syringe pump or equivalent to inject samples directly to the instrument for MS and MS/MS analysis.</p> <ul style="list-style-type: none"> ➤ Spare Syringes- 10 Nos. <p>Appropriate 10 KVA UPS cum stabilizer with at least 1 hour backup must be supplied.</p>	
Warranty and AMC		
<ul style="list-style-type: none"> • 	<p>3 Years comprehensive warranty for all parts including N2 generator (Noise free), Helium Cylinders 2 Nos</p>	<p>3 Years comprehensive warranty for all parts including UPS with battery, N2 generator (Noise free), Helium Cylinders 2 Nos</p>
<ul style="list-style-type: none"> • 	<p>Helium Regulators (S.S.) 2 Nos Moisture / hydrocarbon trap 1 Nos with Preventive maintenance with IQ/OQ from the date of completion of installation, training & validation to the satisfaction. The system should have GLP compliance and should strictly meet 21CFR part 11 guidelines.</p>	<p>No Change</p>
<ul style="list-style-type: none"> • 	<p>Vendor should quote IQ, OQ, and PQ (Qualification) for supplier along with software. Vendor should quote qualification kits and defined list of items along with valid cat. no. and product no</p>	<p>Vendor should quote IQ, OQ (Qualification) for supplier along with software. Vendor should quote qualification kits and defined list of items along with valid cat. no. and product no</p>
<ul style="list-style-type: none"> • 	<p>Manpower for 3 year PhD Pharmacy/Analytical Chemistry/Chemistry or M.Sc. (Analytical chemistry/chemistry) With 4 years' experience</p> <p>Prior experience in Mass spectrometer/HRMS handling preferable.</p> <p>Salary:Rs.50,000/-consolidated per month</p>	<p>Manpower for 3 year (PhD qualification with minimum of 1 years experience or Masters degree with 4 years experience)</p> <p>Prior experience in Mass spectrometer/HPLC/LC-MS handling preferable.</p> <p>Net Salary: Rs. 50,000/-consolidated per month with 5% increment every year</p>

•	Power rating As per Indian standard	No Change
•	Price details for additional five years of AMC after completion of three years of warranty and five years of AMC to be quoted.	No Change
•	Optional items	No Change
•	Should quote the GC-APCI ion source for GC-	
•	QTOF analysis applications	
•	Should quote a cryo-ESI source with temperature from +100 to -90 Deg C suitable for low temperature ESI analysis Certificate will be required from the original equipment manufacturer that technical support along with all essential spares will be provided / made available for at least 10 years after the expiry of three-year standard warranty period.	