NATIONAL INSTITUTE OF PLANT GENOME RESEARCH
(An Autonomous Research Institution of the Department of Biotechnology
Ministry of Science and Technology, Govt. of India)
Aruna Asaf Ali Marg, New Delhi – 110 067
Phone: 26735139, 26735141 Fax: 26741658, 26741146

CORRIGENDUM

This has reference to our Tender No. 8/I/NIPGR/S&P/2018-19 towards supply and installation of **Integrated High Performance Thin Layer Chromatography (HPTLC) system**. In this context, this is to mention that the dates for submission/opening of Tenders have been revised and extended upto **9/8/2018** (3.00 P.M/3.30 P.M respectively).
Placed below are the revised specifications, however, all other terms and conditions of the tender remain unchanged.

Specifications

Integrated High Performance Thin Layer Chromatography (HPTLC) system for quantification, identification, finger printing and micro-preparative separations of plant secondary metabolites with TLC-MS interface for direct mass analysis on TLC plate with following items: automated TLC applicator, Scanner, UV cabinet, photo-documentation, TLC plate heater, TLC chamber, software, computer system, printer, UPS, nitrogen cylinder with regulator

1. **AUTOMATIC TLC/HPTLC SAMPLER**
   Fully automatic TLC sample application, 4th generation and stand alone or with system manager control. It should have 6 mode applicator for 1) Quantitative analysis 2) Micro-preparative chromatography (190mm band length & any vol. selectable) 3) Superimpose – internal standard or derivatization reagent in same method 4) in-situ clean-up (sample application at 110mm on y axis) 5) Rectangular application for fast application for aqueous samples 6) heated nozzle blowing hot nitrogen on samples for quick drying. Accepts sample syringes 10, 25 and 100µl with fixed or removable needles. Can be used as aid for mobile phase development. Min. application volume 10µl.

2. **GRADIENT AUTOMATIC MULTIPLE DEVELOPMENT CHAMBER**

   PC controlled chromatogram developing chamber and its control module. Upto 25 times stepwise multiple gradient development in same direction must be possible. Use of upto 5 solvents to make gradient. Plate drying time must be 1 – 5 min. Gas phase equilibration after every step must be possible. Mobile phase front monitoring by CCD must be possible. Vacuum sensor must be built in. Gradient display on screen, validation software + self-diagnostics built-in. Vacuum connector, Optional link to system manager, Vacuum pump is required

3. **AUTOMATIC DEVELOPING CHAMBER WITH HUMIDITY CONTROL**

   Automatic Developing Chamber for fully automatic development of TLC and HPTLC plates 20 x 20 cm, 20 x 10 cm and 10 x 10 cm (glass, plastic, aluminium). Development in 20 x 10 cm twin trough chamber must be possible. Solvent front detection by CCD must be possible. Activity and preconditioning of the layer, chamber saturation, developing distance and final drying can be pre-set and automatically controlled by the system. Sensor monitored humidity control must be present, which allows reproducible chromatography at defined activity of the layer.

4. TLC / HPTLC SCANNER WITH DATA EVALUTION :

System Manager controlled Scanner / Densitometer for automatic spectrum scanning for identity check as well as purity check; Automatic quantitative measurement by absorbance & fluorescence; All TLC / HPTLC plate sizes must be acceptable; Scan speed 100mm/sec @ 25µm resolution; Wavelength range 190-900 nm; Monochromator flushing by nitrogen; Data sampling rate – 4000 / sec; Special Macro optics for TLC & Micro optics for HPTLC. Spectrum scan speed 100 nm / sec; Max 999 spectra / plate; Visible pilot slit image / scan compartment illumination with UV to check sample alignment with scan beam; D2, Hg, W lamps must be built-in. Plate can be easily placed inside scanner

Data evaluation 32 bit software (latest version), Good S/N ratio. High reproducibility; Controlled by system Manager, automatic / manual data integration, Auto baseline correction. Spot check facility. 3D display with data storage and auto calculation of each peak at its λmax. Calibration - single level, multilevel, linear / non-linear. Statistics CV / CI. Reproducibility check facility. Auto calculation of data from wts and dil. factors must be present. Lamp use tracking. Service Dialog + Self Diagnostics + Tutorial all built – in. Meets GLP. Optional IQ-OQ and 21 CFR Rule 11 certification.

5. ESSENTIAL SOFTWARE FOR SCANNER

a. Spectrum Scanning option
b. Scanner Quantification
c. Multi Wavelength evaluation: Measures, stores and calculates automatically quantitative results from upto 30 wavelengths. Data stored & 3-D displayed in 3 ways. Colour plots of data. Automatic quantification with respect to λ max of separated fractions, in absorption & fluorescence mode.
d. Spectrum Library: Facility to create your own library. All files searched automatically for λ max as well as Rf.

6. PROFESSIONAL TLC / HPTLC PHOTODOCUMENTATION SYSTEM under GLP :

For fully automated image documentation at 254nm, 366nm and visible light. Illumination Unit, Industrial Camera and HPTLC specific software must be present.

a. **Illumination unit** – with 254 + 366 nm UV and Visible light (from above & below the plate). Uniform illumination. 60 KHz supply for instant, flickerless illumination. Easy access for changing tubes & filters and PCB. Auto switch off. Total darkness. Viewing window to observe plate in UV. Safety - UV switched off if door opened.

b. **Camera** 48 bit, high resolution industrial camera head (248 grey level resolution). Images of the highest quality. True colour capture. Very linear response. Individually calibrated. Camera head must be PC operated and does not have any controls. Image data and report through system manager software only, with ability to generate tamper proof data.

c. HPTLC Specific Software – Automatic image optimization, exposure time to suit brightest zone within dynamic range of CCD. Full function annotation. R_f scale. Child image with or w/o ROI (Region of Interest) blow up. Auto image capture at 254nm and or 366nm and/or white light. Spot application tool to detect faintest fractions. High speed data transfer, control by system manager. Options to process the image. High Resolution Documentation software for IQ-OQ, performance check, clean plate correction, image averaging, image subtraction, white adjust and flat field corrections. Very useful to create the best possible image for evaluation.

d. Image comparison viewer software: Allows comparison of different tracks from different plates under GLP. A must for accurate comparison. Extremely user friendly. Can create artificial plate with relevant data.

7. HPTLC/TLC – MS Interface 2 :

HPTLC interface for MS- rapid and contamination free elution of TLC/ HPTLC zones with online transfer to MS for guaranteed substance identification. Plug and play with most mass spectrometers. Elution into vials for further analysis e.g. NMR, IR and other MS techniques. Oval head for elution built-in. Circular head optional. Improved elution head and easily exchangeable filter before switch valve. Push button cleaning of elution path by compressed gas to prevent clogging. Laser for alignment of elution head and zone. Plate table with scale. Adjustable plate stopper. Suitable for glass and aluminum foil backed plates. 4 bar N2 required. Pump for Elution solvent required (50-300 µl / flow min.)

8. TLC / HPTLC PLATE HEATER

For in-situ derivatization and layer activation, stain resistant ceran glass top; temp range 25 to 200^0C. Uniform heating of plate. Digital display of set & actual temperature. Display remains on as long as plate is hot. Upto 20 x 20 cm size plates.

9. CHROMATOGRAPHY VISUALISATION : UV CABINET

Latest model of dual wavelength 254 nm + 366 nm with guaranteed minimum intensity, as follows : UV lamp at 17 cm distance. Short wave UV (254 nm) 1600, long wave (366 nm) 1000, Visible light (<400nm) 0.4. Full protection to viewer's eyes and skin from UV light for safety. High tech 50 kHz power supply for flickerless, instant illumination. Auto switch off after 10 min. Thermal sensor and tilt sensor built in for user safety

10. DERIVATIZER

Must have micro-droplet spraying technology for derivatization of TLC plates, highly homogeneous reagent distribution through optimized droplet size, recommended settings for the most common derivatization reagents, safe and environmentally friendly operation through closed system, intuitive handling and easy cleaning. Both 20x20cm & 20x10cm TLC/HPTLC plates compatible with 2ml derivitization reagent consumption for 20x10cm plates & 4ml for 20x20cm plates

11. **HPTLC SOFTWARE** –

The software must be new generation, single software to link, control, integrate, manage the instrument for application, development, scanning and image documentation. Guides the user through chromatography steps with sample oriented approach. Numerous method library available for internet download for lifetime. Client-server system for flexibility. The software must have powerful database tracks for individual samples and ensure data integrity. Several tools for System Suitability Test. Built-in automatic back-up and restore tool for data. Produces a comprehensive GLP compliant analysis report with instrument, analyst, date, time, place, method parameters etc. and complete details. It should communicate in both directions with instruments and stores infinite number of methods and downloads them to instruments, when called for. It must be GLP compliant and 3rd generation

12. ACCESSORIES:

Workstation, Printer (Heavy duty, Color and Auto duplex) and UPS must be provided – (1 nos) The processing PC should have the following minimum configuration or better: Precision T7910 XL

processor: E5-2667 v3 (8C HT, 20MB Cache, 3.2GHz Turbo); RAM: 32GB (4x8GB) 2133MHz DDR4 RDIMM ECC; 4x2TB SATA 7.2k RPM HDD; 512MB NVIDIA Quadro NVS 310 (2DP). Monitor: 27 inches; Microsoft Office: compatible version with the operating system.

5 KVa UPS or better with 1hr power backup for HPTLC.

2 nos of N_2 cylinder with double stage regulator

Chromatogram Development Chambers

a. All glass molded, one piece, bubble free chamber for TLC/ HPTLC. Bottom divided into two equal halves with a sloping divider. Chamber top and bottoms (both outside the chamber and inside the two troughs) should be perfectly parallel to each other. Chamber ground finish on top for good seal and at bottom for perfect level. Heavy chamber to minimise effects of vibration. One piece joint less moulded chambers prevent leakage and tough to handle while cleaning. Stainless steel, rust proof lid with overhang to completely seal the chamber.
b. 20x20 cm, - 5 nos
c. 20x10 cm – 5 nos
d. 10x10 cm.- 10 nos

TLC precoated plates 20 X 20 cm silica gel F254 on Al foil – 5 Box
TLC Cutter 2 nos

General conditions: -

1. Demonstration of various specifications should be given by the successful bidder.
2. Analysis support: Since we deal with complex samples, support for analysis should be given by the vendor by sending their application specialist, free of costs during the warranty period
3. Equipment should be future proof and manufacturer is expected to offer upgrade whenever available rather than change models.

Training:

1. Complete systems should be installed and commissioned at NIPGR. After successful installation selected scientific/technical personnel from NIPGR should be provided with hands-on and in-depth training on the operation and maintenance of the system as well as specific application training by factory engineers and application specialists for not less than 30 days.
2. A live demo and analysis of our samples must be done by bidders at their cost.
3. Only Principal/Manufacturer should quote.
4. All specification must be supported by the official brochures from the company.
5. Only those bids/offers with the complete specifications mentioned above will be considered.
6. Since HPTLC are very sensitive equipment and requires regular servicing and support for smooth functioning of the facility, user's feedback as deemed by competent authority may be taken. Based on the user's feedback the competent authority reserves the right to reject the bid submitted.

Warranty period:

1. 5 Year comprehensive warranty should be quoted for the whole instrument and parts. Comprehensive warranty should be provided by principal equipment manufacturer and for all other related accessories including but not limited to third party supplies.
2. Instruments must be attended within 48 hr in case of any breakdown. The uptime for the facility should be 95% per year or more.
3. Two preventive maintenances for the complete platform should be performed every year during the warranty period.

Optional:

1. **SEMI AUTOMATIC SPOT / BAND APPLICATOR (OPTIONAL ITEM)**

Sprays sample to layer. Stand alone or System Manager Control. 4 mode applicator 1) Quantitative analysis 2) Micro-preparative chromatography (190mm band length & 500µl sample in one go) 3) Superimpose – int. std.or derivatization reagent in same method 4) in – situ clean-up (sample application at 110mm on y axis). Sample syringe – 100µl (for analytical work) 500µl (for micropreparative work). Sample position on X & Y axis freely selectable. Automatic rate of sample dispensing. Method storage – 10 built-in or infinite through system manager. Method entry – Manual or download from System Manager. Can auto – test instruments (self-diagnosis).

Company should provide a trained and qualified person for functioning and maintenance of the instrument for the first one year from the date of installation.