

National Research Center on Plant Biotechnology
Pusa Campus, New Delhi-110012

Tender Specifications for Different Equipments

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Tender Spec. A. : Freezer (-80°C)

Microprocessor controlled, programmable, digital upright deep freezer with 570 L capacity, Programmable temp. control range -20 to -80 °C with accuracy better than $\pm 1^\circ\text{C}$: Scratch and rust-resistant 18 gauge steel with 1.2mm thickness of powder coating: Stainless steel(304L grade) interior: Polyurethane insulation of 130 mm thickness: five inner compartments with insulated inner doors: Door handle with removable lock and key: Door latch with cam action: Front mounted air filter: Onboard SMART diagnostic built in software: Battery backup: Automatic reset: Programmed Restart-Random startup(1-1.5 min apart): Four digit password facility: Audio/visual alarms for high/low temperature: power out, system fail, battery low etc: Provision for remote alarm contacts: CFC-free and HCFC-free system: Capacity to bring down temp to -86°C in less than 4 hours: Suitable Voltage stabilizer: 230 volts.

Tender Spec. B. : Deep Freezer (-80°C)

Upright with 4-5 compartments, doors having double real gaskets for individual compartments, temperature -40°C to -85°C, inner chamber made up of heavy gauge corrosion resistant zinc coated galvanised steel, outer shell of heavy gauge cold rolled steel, capacity about 20 cubic ft, heavy duty CFC + HCFC free, microprocessor controlled, self diagnostic alarm warning system in case of power failure and over temperature conditions, digital temperature controlled & LCD display, CO₂ or nitrogen security back up with stabilizer of appropriate ratings.

Tender Spec. C. : Electronic Balance

Electronic analytical weighing balance with weighing capacity of 210g, readability of 0.1mg, repeatability of $\pm 0.1\text{mg}$ & linearity of $+0.2\text{mg}$; High contrast liquid crystal display; Bidirectional interface port; AC adaptor; ISO 9001 certified; Two year warranty

Tender Spec. D. : Plant Tissue Grinder/ Homogeniser with accessories

for rapid & efficient grinding/homogenising of 10-100mg each of 192 plant samples simultaneously using tungsten carbide/steel beads: should be programmable to provide variable speed upto 30Hz and time: should have facility to prevent tube-to-tube contamination: should include all the necessary accessories including adapter plates, beads and tubes sufficient for high throughput grinding.

Tender Spec. E : Clustered SERVER, Storage and Application Software**1. Sun Fire V880Z server with Solaris 8 OE or higher/equivalent 64 bit Linux based system**

General Server Specifications:

- Server should have full 64-Bit architecture. SUN FIR V880Z Server SOLARIS /or Equivalent 64 bit Linux based System
- State of Art technology
- Operating system should be Solaris8/ 64 bit Linux
- The Server be enabled should support clustering with another similar server for high-availability
- Server should support the following communications standard – TCP/IP, NFS Client Server, FTP Client Server
- The Servers should be configured as rack mountable in a minimum 17U industry standard rack.

SPECIFICATIONS

SUN FIR V880Z Server SOLARIS /or Equivalent 64 bit Linux based System: One System

Specifications: MNC Brand Server (2 Qty)
Architecture: EPIC architecture based RISC/ Itanium 2.
Number of CPUs & Scalability: 1 CPU's scalable up to 8 on a Single Operating System Image.
CPU Clock-speed: 1.5Ghz or higher.
Cache/CPU: minimum 4-MB L3 on-chip cache per CPU
Main Memory: Configured with total globally shared 2GB ECC RAM memory scalable to 16 GB Memory.
2 no. of 2GBps FC Card, 2no. of 1 GBPS Ethernet card
DVD-ROM: DVD-ROM
Management Console
Internal HDDs: 2 x 250 GB, SATA/ SCSI Disks.
OS: SUN Solaris 8 or later / 64-Bit Linux Operating system with unlimited user license. OS to have the following features:- 64 bit hardware & application Support Confirming to TCP/IP, Server & Services, NFS Client Server, FTP Client Server, DHCP, LPD, DNS, and BOOTP.
Cluster Management Software for clustering
Manageability features: Built-in manageability features

2. Software's for integration of various platforms**Requirements for a genome db/ info system:****Data components:**

- Genome sequence types, literature, external data (plant spp, others), expression info, pathways, maps, anatomy, populations, species, ecology, stocks, people
- Standard data structure and exchange schema (sequences, tables, XML)

Structure:

- Complex document structure; tabular data; etc. Organize: Table of contents, Reports, Indexing
- Browse contents; Search / retrieve from biological questions
- Bulk data search / retrieve for bio-informatics

Content:

- Literature (abstracted and curated), Sequence and feature analyses, maps, controlled vocabulary/ontologies, people, biologics, contacts, etc.
- Metadata describing primary data, along with protocols, notes, sources

Data exchange:

- XML data definitions & schema
- Controlled vocabularies of science terms, ontologies
- Minimal information for collaboration, sharing

Informatics / software:

- Backend database, data collection, management, analyses
- Front-end services (hypertext web, search/retrieval); ease of understanding and usage
- Middleware software, interfaces
- Genome specialized: maps, BLAST searches, ontologies

Integration with Existing Information System and Applications:

- Integration with existing DBMS Systems and application at NRCPB
- Integration with existing infrastructure
- Porting of existing application to the new environment

Architecture Requirements of the Information System:

- Web Server Based, standard, open-source
- Relational database for data management
- FTP server for bulk data exchange
- Search and retrieval software for flat file data
- Flexible – data schema changes common
- Biotechnology Analysis Program (BLAST, other bio-informatics tools)
- Limited, secure access for project data management (WEB, FTP, Other)
- Public access for released data (web, ftp)

3. DLT (tape)-IV Media:

- 40/80GB HP DLT-IV Media
- Unit Price of the media has to be quoted
- Number of Items will be decided at the time of placing the order

4. Three year Warranty

- Three years comprehensive warranty has to be quoted for the entire system and services

5. Two year post warranty AMC

- Two years post warranty AMC has to be quoted for the entire system and services

Tender Spec. F : Sun Server or Equivalent**Name of the equipment: Sun Storage Server or equivalent (1 qty):****Specifications:**

MNC Brand SAN Storage Solution
RAID Capacity needed : Total Storage of 1.2 TB scalable to 5TB in RAID environment
RAID Controller : Dual RAID controller with 256 MB Cache
Dual ported Disk drives of 300GB 10 K rpm to be used.
Support for Clustered File system
Max heat dissipated from a fully configured server < 1600 BTU/hr.
Max power consumption for a fully configured server < 450 W.

2. Three years comprehensive warranty has to be quoted for the entire system and services
3. Two years post warranty AMC has to be quoted for the entire system and services

General Instructions for Tenderers for Server, Storage and Integration/Application Softwares

General Instructions for Tenderers

1. NRCPB invites tenders from established and reliable System Integrators for an end-to-end solution for the establishment of a state of the art technology for NRCPB Genome Data Centre on **Turnkey basis**.
2. The broad specifications are as indicated in above. The bid will be submitted in Three separate sealed envelopes, viz. (i) Pre-Qualification Documents and EMD(2% of total cost of Instrument in the form of a crossed Demand Draft in favour of Project Director, NRCPB payable at any scheduled Bank at New Delhi)(ii) Technical Bid and Commercial terms(iii) Financial Bid. Companies who are eligible to bid should meet individually and all the criteria viz. (a) annual turn over of not less than Rs. 100 Crores during last financial year, (b) having successfully executed contracts of similar nature in mission critical environment and have implemented scientific data centers at least one in the last three years (attach proof). Preference may be given to those who have operational office in NCT region.
3. All offers in the prescribed format should be submitted before the time and date fixed for the receipt of offers as set forth in the tender papers. Offers received after the stipulated time and date are liable to be rejected. The Tenderer must ensure that the conditions laid down for submission of offers detailed below are correctly and completely fulfilled. Tenders found to be deficient in any respect shall be summarily rejected. Similarly, conditional offers and offers with terms and conditions inconsistent with those contained in this document shall be rejected.
4. In the event of the tender being submitted by a firm, it must be signed separately by each member thereof, or in the event of the absence of any partner, it must be signed on his behalf by a person holding power of attorney and in case the firm is registered, a copy of the certificate issued by the Registrar of firms be furnished. In the event the tender submitted by a Company, it must signed by a person who is authorised under the Articles of Association of the Company to do so or by a person holding a duly authorised power of attorney supported by Board Resolution of the Company.
5. The service providers will install/test/commission the required hardware and software and demonstrate the throughput of the system integration with the setup of NRCPB including existing databases and currently under development databases.
6. It is also expected that the service provider will incorporate the technological changes happening in the field and accordingly integrate/install such equipment, which can be adopted easily without sacrificing the main objective of the tender. The Service provider will be a single point of source for all details/troubleshooting and provide detailed traffic statistics periodically.

7. NRCPB will provide required documents/authorization letters/pass etc to co-ordinate with any other agencies that can be involved.
8. After completion of warranty period, NRCPB may propose AMC, in the form of an agreement, to provide Annual Maintenance of all equipment involved in the solution.

Background Information

1. The tenderer shall provide the following information with the technical bid to provide background information of the tenderers.
2. Complete technical details of the product quoted including make, model, manufacturer, detailed technical catalogue, details on quality certification (with copy of certification) brief write up describing the key features why the product is suitable for meeting the NRCPB's needs.
3. The bid should include an assessment of modular and integrated databases.
4. Recommend the most efficient, economic and effective solution(s) in terms of money, time and effort.
5. Review on current and anticipated vendor independent technologies that could be utilized.
6. Document the benefits and risks of each possible solution including: data management architecture; interoperability; management and resilience issues and formulate any conclusions into a requirements versus option matrix.

Evaluation of offer

1. The Departmental Purchase Committee, NRCPB will evaluate the tenders on the basis of techno-commercial parameters. The short-listed tenderers may be called for detailed discussions at a specified date, time and venue including demonstration of their products, if need be.
2. The Financial Bid of the technically short listed tenderers only shall be used for making comparative statements.. **The Financial bid should quote the price of the solution and its maintenance for a period of 2 years separately other than 3 years warranty.**

The NRCPB reserves the right to select the tenderer on the basis of best possible features quoted and the lowest financial quotes. The decision of the Purchase Committee arrived at as above shall be final and representation of any kind shall not be entertained on the above. Any attempt by any tenderer to bring pressure of any kind may disqualify the tenderer for the present tender and the tenderer may be liable to be debarred from bidding for NRCPB tenders in future for a period of three years.

Annexure - II

(To be filled and sent with technical bid)

FORMAT OF QUATATION FOR TECHNICAL BID (COMPLIANCE STATEMENT)

Name of the Company: _____

S. No.	Make/Model Offered	Technical Specification as per tender	Technical Specification of the product offered	Deviation (if any) with remarks

- Please give brief description on the technical superiority/inferiority of each item to be supplied by Tenderer separate sheet may be attached if necessary.

Date:**Signature & Seal of the Tenderer**

Annexure - III

(To be filled and sent with financial bid)

FORMAT OF QUOTATION FOR FINANCIAL BID

S. No.	Description of Items	Qty.	Basic/Unit Price	Taxes (As Applicable)	Total Amount
1.	SUN V480 SOLARIS /or Equivalent 64 bit Linux based Servers with Cluster Software	2			
2.	Software's for integration of various platforms and Applications	1			
3.	40/80 GB HP DLT IV Media	1			
4.	Three Year warranty Support for entire system	1 Lot			
5.	Two year AMC for the entire system	1 Lot			

We agree to supply the above goods in accordance with the technical specifications for a total contract price of(amount in figures) (.....amount in words) within the period specified in delivery terms in tender document (.....).

Date:**Signature & Seal of the Tenderer**Annexure - III

(To be filled and sent with financial bid)

FORMAT OF QUOTATION FOR FINANCIAL BID

Description of Items	Qty.	Basic/Unit Price	Taxes (As Applicable)	Total Amount
RAID Storage	1			
Three Year warranty Support for entire system	1 Lot			
Two year AMC for the entire system	1 Lot			

We agree to supply the above goods in accordance with the technical specifications for a total contract price of(amount in figures) (.....amount in words) within the period specified in delivery terms in tender document (.....).

Date:**Signature & Seal of the Tenderer**

Tender Spec. G : Proteomics System

A complete proteomics system starting from sample preparation to the identification of individual protein spots after 2-D separation for expression profiling. The system must have the following components with proper integration. Individual components would be considered separately only where integration is not a problem.

(A) Sample Preparation and Purification module (1 number):

- System for sample Purification/ preparation and quantification of Proteins.
- System should come with Binary Gradient pumps, Flow rate of 0.01 – 100.0 ml/min with pressure upto 3500 psi.(10Mpa)
- System should be completely biocompatible to protect protein functionality.
- Should have variable wavelength UVdetector (190 to 700nm), with minimum 3 wave length simultaneous detection.
- Should come with conductivity detector (0 – 999 mS/cm or more) and pH.
- Fraction collector with time, drop, volume mode of collection. Should be compatible with various tubes, eppendroff tubes should be cold room compatible.
- Should come with Injector valves with various loops of different volumes. Data Acquisition and integration software should also come with the system.
- System should come with one each of Ion exchange, Gel Filtration (size exclusion-high range: 20-1000 KD), and affinity column as standard accessory.
- A data processor to run the above software should also be there (P4, 512 MB RAM, 80 G HDD, 17" monitor, Windows XP Pro, CD/DVD Combo Drive or better and printer.
- Any alternative system for sample preparation/concentration prior to electrophoresis separation

(B) Electrophoresis module

Iso-Electric focusing units (2 numbers):

- Should have In-Built Power supply : 100 V to 10000 V
- Built in Peltier based cooling: Operating Temperature: 15-25 °C
- System should be able to take IPG strips of 7cm, 11cm, 18 cm, 24 cm size
- IPG strip holding capacity: 12 strips
- Should come with accessories like Forceps, electrode wicks, mineral oil etc.
- Should also come with Cup Loading tray
- System should come with USB computer interface and data handling unit.
- The software for 2D with the DIGE application to analyze 2D gels
- Should supply Cy2, Cy3, Cy5 minimal labeling kit for first use and demo of DIGE application.
- Should provide documentary evidence/publications on DIGE
- **Thermostatic circulator (1 number)** to control temperature (-10 to 90°C) for SDS PAGE units
- **Small SDS PAGE units (2 numbers):** 7x 8 cm gels, complete with accessories like combs (1.0mm,10 well combs, Glass Plates, Spacers, Casting chamber, sample loading guide etc.
- **Medium SDS PAGE units (2 numbers):** 16x18 cm gels to run four gels simultaneously with built in heat exchanger
- **Large SDS PAGE units (2 numbers):** 18 cms (two each) to run 6 gels simultaneously. Gel Caster should also be quoted.
 - Should be able to take precast gels and have provision for casting gels.
 - Should come with Gradient former
- Should also come with an **gel stainer/ destainer** tray

- **Power Packs (4 numbers)** Power Pack Basic, 600 V, 400 mA, 400W, with 2 recessed port in parallel.

C) Proteomics imager with advance image analysis software (1 number)

- Imager for high sensitivity detection and analysis of 2 D protein gels. Protein samples in Gels, Blots and DIGE compatible applications. Fluorescence detection
- The imaging screen should take both 20X25 cm and 35 x 43cm sample size System should come with following
 1. Exposure Cassette (2 large and 4 small)
 2. Small Screen (4) 20X25 cm
 3. Large Screen (2) 35 x 43cm.
 4. Common eraser for both the sizes should also be there.
- Three laser source with auto aligning mechanism and indicated power of the laser i.e., 532 nm solid state laser (25mw), 488/457nm argon ion laser (20 mw), 635 nm laser (10mw). All three lasers should be inside the machine.
- The resolution should be 25micron, 50 micron, 100 micron, 200 micron and 800 micron, user selectable
- The system should be open for any type of manufacturers' screens as per users choice as well large area eraser to take care of small and big size screens
- Linear Dynamic range should be 5 order and uniformity should be +/- 5 % over entire scan area
- Linearity (r 2) should be less then 7.5%
- The system should have confocal/fiber optic scanning mechanism and should scan from top/bottom of the sample, and be able to read blot, ELISA plates, medium density arrays, and fluorescence gels both in dry and wet conditions. It should also take thick samples (up to 3mm thick gels).
- System should come with USB computer interface.
- The software for ID and 2D with the DIGE application.
- System can be used as protein array scanner in future with protein arrayer.
- Should be able to seamlessly integrate with other components of proteomics work Flow.
- Automatic Spot Detection & Quantification, Simultaneous analysis of unlimited gels Databases of unlimited numbers of gels
- Batch processing of experiments , Suitable for DIGE analysis
- Should be able to compare experiments and warp matching.
- Ability to detect and separate merged, overlapping spots.
- Background removal algorithm for most accurate representation of faint abundance proteins. Multiplex Gel Normalization with normalization table feature.
- Filter wizard finds the most optimal image, Gel land marking and automatic spot matching
- Should be able to Export data in XML file format and/or TIFF / JPEG file format.
- Group consensus feature to review consensus data for individual gels classes or replicate groups/ batches.
- Can be integrated with data from IMAGING SYSTEM , SPOT CUTTER etc
- Should be GLP/GMP Compliance, and should have facility for up-gradation in future.
- Network license supporting for more number of user.

(D) Robotic Spot picker and cutter (1 number)

- **High throughput Automatic Spot Cutter for cutting gels, blots on glass back, plastic backed or free gels (non backed gels)**
- **Cuts as high as up to ~200 or more spots per hour**
- Up to 4 gel hands free processing
- Should be able to cut gels/ blots with visible and Flourescent stained gels.(Visible and UV stain compatible)
- Cuts upto 2.0 mm thick gels

- Should come with Cooled CCD , 1200 X 1600 pixels
- Integrated advanced software for 1-D and 2-D gel cutting with features like Automatic Spot Detection & Quantification, Simultaneous analysis of up to 100 gels, Databases of unlimited numbers of gels,
- Liquid handling and vacuum assisted pick up/delivery of spots = 99.5% accuracy
- 100 um resolution or better
- Microtiter plate holder for 96 well, 384 well, and 96 deep well plates.
- Removable gel holding tray for easy handling
- Should have ability to detect and separate merged, overlapping spots.
- Multiplex Gel Normalization with normalization table feature.
- Gel land marking and automatic spot matching
- Creates analysis sets, which integrate the functioning of spot cutter.
- Integrates image to the data from proteomics Imager, Mass Prep station and Mass Spectrometry
- Should be GLP/GMP Compliant, and should have facility for upgradation in future.

(E) Protein digester (1 number)

- Highly versatile instrument design to perform in-gel digestion of proteins captured from 2-D gel electrophoresis spots.
- Digestion protocols should optimized with and compatible with Coomassie silver, and fluorescence staining system.
- Standard microplates increase ease of use as low salt buffers, which eliminates the need of desalting.
- Parallel multi-samples handling. Approximately 384 samples can be processed in less than 10h.
- It should supplied with computer and monitor, control software, 500ul syringe, needles, enzyme tube holder, enzyme tubes, calibration plate, calibration tool, tubing kit, tubings an fittings, and waste bottles.
- Operating temperature is 18-30oC, voltage 220-240V, 50/60Hz single phase, power consumption 200VA with sensitivity 100 fmol or better.

(F) Spotter for the MALDI ToF plates picker (1 number)

- Design to automatically mix and spot digested proteins and matrix onto any MALDI-ToF target.
- Easy to setup and run, directly on digester output files.
- Needles to eliminate cross contamination.
- Automatically spots 384 samples/batch in less than 4h.
- It should supplied with computer and monitor, control software, 100ul syringe needle, vial with cap, and tubings and fittings.
- Should work at 220-240V
- Spotting capacity 384 samples (batch mode), 96 samples (manual mode), processing capacity 96 samples, in less than 1h

(G) Maldi-ToF/ToF (matrix-assisted laser desorption ionization-time of flight) for protein identification with software (1 number)

The **MALDI TOF/TOF** instruments having features that are required for protein analysis in general and for proteomics studies in particular with as:

Ion transmission in linear mode for protein MW measurement. High resolution in reflectron mode ($R > 25000$), high mass accuracy. High sensitivity in both linear mode and reflectron mode (nm to fm range) fragmentation modes LID, CID, LIFT and ISD. Versatile mass range upto 350'000 Da. In addition, the system should have a sample throughput capability for analysis in a 96/384 plate formats.

The system include following

(a) The source which should have

- an accurate motorized plate holder for handling MTP compatible targets coated with an hydrophobic film onto which hydrophilic anchors are imprinted for concentration and better positioning of the sample.
- a high repetition rate solid state N2 laser (200Hz SmartBeam laser for fast acquisition)
- a grid-less delayed extraction source (necessary for higher mass accuracy vital to PMF analysis)

(b) The analyzer and tandem MS part should come with

- a first time-of-flight (TOF) region for ion separation
- a collision cell (CID)
- a parent ion selection device (Timed Ion Selector or TIS)
- a second ion source device which slows down and reaccelerate the ions for fast and sensitive MS/MS analysis of meta-stable ions and CID products.
- this device should be followed by the second TOF region of the instrument that is used to analyze the fragments of the meta-stable ions when the LIFT is activated

(c) The ion refocusing region and detector with a two stage gridless reflectron to better refocus the ions on the detector plane (necessary for higher mass accuracy vital to PMF analysis) with a fast detector coupled to fast electronics for high digital sampling rate.

(d) Data System and Software should have

- HP Workstation/Windows™ XP operating system, ≥ 3.0 GHz dual-Xenon-processor, 1 GByte RAM, 160 GB hard disk, DVD+RW drive, DVD-ROM drive, 1xEthernet connection for external networks, 2 GHz Digitizer plug-in-card; ≥ 20" HP LCD-Display
- Laser printer HP laserjet color 3800dtn printer with 22ppm black and 22 ppm color printing speed, 699x600 dpi black and color print resolution, HP ImageREt3600 print technology, 288 MB printer memory, 533 MHz MIPS 20 Kc Embedded processor, automatic duplex printing, 100-sheet multipurpose tray, 250-sheet input tray, 500-sheet paper tray, letter, legal, 8.5x13in, excutive, statement, envelopes supported paper size standard networking and 1 USB, 1EIO connectivity.
- Mass spectrometry software Compass™ 1.1 for Flex software package for MS control, data acquisition and processing, AutoXecute™ with fuzzy-logic optimization for automated acquisition
- Remote Service capability via 128-bit SSL-security WEBEX-sesion

(e) Miscellaneous

- Should do complete Installation; training for two after installation with 1-year warranty
- Any additional power points and special work bench required must be provided

General terms and conditions:

- 1) EMD and cost of tender must be placed in a separate envelop from that of the quotation and should be clearly marked accordingly.
- 2) If offers of more then one item are submitted by a firm, the offer for each item must be submitted in a separate envelope, however all such envelopes can be sent under the cover of a single envelop.

- 3) The offer must include:
 - a) Signed declaration that the rates quoted are the lowest quoted to any other buyer of same equipment
 - b) Signed declaration that hard copies of relevant operating instructions and service manuals in English will be supplied along with the equipment
 - c) Printed detailed technical brochures/literature of the equipment
 - d) Representative user list with certificates of satisfactory performance and contact numbers for reference
 - e) Company profile with special reference to after sale service support set up and current authorization letter of the Principals in case of agents/partners
- 4) The offer must carry a two year parts and service warranty and should include a proposal for annual maintenance contracts after the expiry of warranty period
- 5) The offer must include a list of fast moving maintenance spares together with their cost under optional
- 6) The offer must include the cost of installation, demonstration, and on site training for two persons from our lab in the use of sophisticated equipment
- 7) All the essential accessories and support equipment are needed for the successful installation and use of the equipment must also be quoted. **This includes proper bench and power cables etc needed for the equipment (please inspect the lab before quoting)**
- 8) The Firm must provide evidence from at least two customers for the previous supply, successful installation and after sale service support for similar equipment within India. Bid of small time commission agents without proper infrastructure and manpower for providing after sale maintenance service support will be rejected.
- 9) In case of proprietary items a certificate must be provided from the Principals/Manufacturer stating that no other company is manufacturing and marketing items with similar functionality by any other name
- 10) Firm must have all the proper marketing licenses for the sales of any IPR protected items to enable them provide legitimate and trouble free after sale service support. Offer without proper IPR license would be rejected.

11) Separately sealed technical and price bids should be submitted.

Tender Spec. H : Microarray System**Microarray set up including arrayer, scanner and hybridization station**

High resolution microarray platform capable of spotting oligo-arrays, cDNA clones, hybridization oven, wash station, microarray scanner & computer workstation with integrated software capable of data acquisition from arrayer, wash station and scanner. System should be capable of running gene expression, validation and genotype expression having capability to generate high quality statistically validated MIAME compliant publishable data. All the equipments should be quoted with three years warranty.

A. RNA Quantification module

1. High-speed tabletop refrigerated centrifuge with 22,000rpm, temperature -15C to + 40C, automatic rotor and electronic imbalance recognition. Brushless, maintenance free induction drive motor with hermetically sealed CFC free refrigerant. LED display for speed, time and temperature display. The system should accommodate microtitre plates, 1.5/2-50ml tubes with 9 acceleration and deceleration profiles.
2. To measure the integrity of RNA samples essential in gene expression analysis. System should have cartridges to use one micro litre sample to carry out RNA quality control. The software should provide RNA quality and grade, electrophoretic trace of the RNA sample, presence or absence of degradation products and handle DNA and proteins.
3. Additionally the module should have high quality 12 bit CCD Camera with motorized control, 1.4 million pixel resolution and fire wire connectivity for faster data transfer along with 1D Software with features for quantitation, mol wt. Calculation, lane-band matching, differential display studies, dendrograms construction, phylogenetic tree construction, Similarity coefficient etc. It should come with a data processor specification of centrino, 512 RAM, 80 GB HDD, 20" TFT, laser jet printer, OS Windows XP Pro.

B. Micro array module

1. **Spot arraying:** System should have TeleChem chipmaker stealth pin type, with a standard print head capable of holding 48 pins. It should have complete user control over array design wrt to array placement, size and shape of arrays; number of spots/sample, number of spots per sub array, array spacing, number of array samples per array, sample blotting (preprinting) feature onto microwell-plate size blot pad with pause and restart control for print runs. The system should be quoted with minimum 4 pins.

Capacity	: At least 48 slides; 4 pins, 15 membranes (80 X 122mm) and 2 source plates
Supported sample plates	: 96- and 384-well format; compatible with a variety of manufacturers
Throughput / Speed	: 2000 spots in duplicate per slide on 50 slides in 1 hour with 48 pins
Positional Resolution	: Spotting diameter of 100micron with 3 microns or better matching accuracy.
Positioning system	: High-performance servomotor with robotic precision of 2 microns or better (x, y axis) and 1 micron (z axis)/automatic slide alignment mechanism.
Control Software	: Flexible and easy-to-use: multiple duplication options, calibration settings, input plates, substrates, and wash scheme with multi user license.
Tip Cleaning	: Tandem combination of sonication, efficient washing and vacuum dry.
Enclosure	: Clear panels for complete visibility; roll top door for easy deck access
Environmental Control	: Positive pressure enclosure with 0.3 micron HEPA filtration for dust-free printing with a provision for humidity control capability to increase/ decrease humidity.
Plate arraying	: Should have an option of barcode reader and plate arraying.
Workstation and Software	: Dual Xeon Processor 3.0 GHz or higher; 2.0 GB RAM or higher; 250 GB or higher hard disk; Windows XP latest version; 20" Flat screen LCD or better and compatibility for complete platform control with multi-user license.

2. Hybridisation and processing

An automated system with true walk-away freedom for hybridization of microarrays. It should automate all hybridization temperature cycles and post hybridization washes of microarrays spotted on standard glass slides. Should be a 12 position unit and multi-protocol software to run 6 independent sets of hybridizations or run all arrays under the same conditions.

Six independently controlled peltier modules to a run as few as 1 slide and 1 blank or upto 12 slides with **user definable** parameters

- | | |
|------------------------------|--|
| a) Hybridization temperature | : 30 – 95° C (1° C variability per hour) |
| b) Wash Temperature | : 30 – 65°C (1°C variability per hour) |
| c) Ramp rate | : 1° C per second or better |
| d) Incubation Times | : 1 second to 72 hour |
| e) Agitation | : for probe hybridization |
| f) Wash Cycles | : multiple washes with >100 cycles |
| g) Wash Timings | : from 1 second to 1 minute per wash cycle |
| h) Reagent Bottles | : 5 or more |

with an ability to program and run multiple protocols with different experiments to be run simultaneously and without the requirement to load all modules prior to a run.

Polysulfone slide chamber covers (Chemical resistant) maintaining physical characteristics over a broad range of temperatures, translucent and should allow viewing of the liquids in the slide chamber.

Clear fluidic manifold and translucent tubing to allow the user to ensure current fluid flow.

Translucent slide covers to allow user to see hybridization surface, while preventing photo-bleaching of fluorescent dyes.

Probe injection using standard laboratory pipette and disposable tips. 100 ul hybridization volume with no dead volume to minimize probe dilution and solution usage.

At least 2 programmable waste bottles to allow the user to separate solutions as necessary.

Internal pentium processor and operating system with touch screen programming for standalone operation and capability to be networked to a computer for PC control.

Software should have the capacity to network up to 8 Hybridisation stations with control from a single PC, allowing user to process at least 12 slides in a single run.

3. Scanning

The system should be able to read slides of varying sizes including non-traditional ones like ceramic, metal, nylon, plastic or silicon and should be able to read slides with cover slip or wet. It should include user-friendly & intuitive software for microarray grid generation, data collection, evaluation and storage, signal to noise ratio and dynamic regulation tools and related analysis functions. It is preferable to have facility to check arrays for spot presence before hybridization without using of special reagents. Integrated barcode reader should be included in the system along with a duplex ADF reprography (64MB) section.

Sample Capacity : At least one slide per universal slide carrier.

Optics : Confocal or semiconfocal (dark filed imaging) with simultaneous/sequential/both excitation and scanning mode with or without averaging.

Laser : Two independent solid state laser without any warm up time requirement with auto-set laser power and 0-100% PMT for easy data optimization. Lasers should have at least 20,000hrs of life time with excitation and emission at multiple wavelengths band pass compatible with dyes Cy3, cy5 and Alexa 555,647 and 660.

Scanning & Sensitivity : System should offer user selectable scanning resolution as low as 3micron to 100micron with possibility to scan entire slide surface at five micron. Sensitivity should be <1 chromophore equivalents/um² or better

Dynamic range : The System should be able to optimize dynamic range and signal to noise ratio in real time during slide scan process with 16 bit data or higher for most accurate quantitation. Scanner should meet less than 5%CV for static and dynamic repeatability to ensure confidence in results.

Resolution : 5 um pixelation or better

Fluorescence dye : Compatible list of all fluorescent dyes at excitation and emission range are to be mentioned

Application Flexibility : Should be capable of scanning new & emerging applications such as tiling, all-Exon, 500K SNP chips, etc

QC Tool Box Kit : To be quoted for scanner performance verification & onsite recalibration.

Acquisition Software : Must provide complete platform control for data acquisition, analysis, clustering, statistical output and data mining with program that can be linked to any number of public domain databases. Reports generated should contain all of annotations and necessary results in MIAME compliant format. Software for protein array expression studies should be quoted in the system.

Analysis software : Software should have the capacity for data organization, visualization, normalization, statistical analysis (such as Multiple group analysis, P-Value generation via permutations or asymptotic analysis, Multiple testing correction and interactive filtering based on p-Value, Fold-change and the number of genes expected by chance), cluster analysis, gene annotation, classification & prediction, enterprise functionality including special functions for analysis of gene expression data. It should provide wizards to import spotted array data of several scanner formats, including genepix, imagene, scanalyze, and quantarray. Automatically retrieving gene information from web sources and viewing this information. The annotation engine should offer other functionalities like pubmed correlation Matrix, Gene ontology browser, Cluster and pathway viewer through KEGG database (AVARDIS/equivalent or better data mining software)

Computer Work station : Dual Xeon Processor 3.0 GHz or higher; 2.0 GB RAM or higher; four 250 GB or higher hard disk for data storage.; Windows XP latest version; 20" Flat screen LCD or better and compatibility for complete platform control with multi-user license.

C. Microarray validation module

1) Validation of microarray data by the Real-Time PCR: Only licensed & authorized RT-PCR Platforms should be supplied along with licensing rights. The instrument should have following features.

Cooled CCD Camera with an algorithm to resolve dyes having high degree of spectral overlap.

Can be upgraded to Fast Real-Time PCR that can run the complete PCR in less than 40 minutes.

Five Excitation and Five emission filters pre-calibrated for following dyes : FAMTM/SYBR[®] Green I, VIC[®]/JOETM, TAMRATM, Cy3[®], ROXTM / Texas Red[®], and Cy5[®].

Supplier should be able to supply Assays on Demand or should be able to design and provide assays for DNA templates of our interest.

Reagents supplied must contain an internal mechanism for normalization of non-PCR related fluorescence fluctuations such as pipetting errors and sample evaporation.

Licensed probe primer design software for designing primers and hybridization probes in a single run.

RQ Software along with instrument for relative quantitation studies.

It should come with a data processor specification of centrino, 768 RAM, 120 GB HDD, 20" TFT, deskjet Printer, OS Windows XP Pro.

Vendor should have a sizable installation; good service and application support back up in India to provide an effective application related troubleshooting, support and training of two persons.

2) DNA polymorphism detection module

A liquid system to read upto 100 or more genes simultaneously in 96 well format having qualitative and quantitative analysis function including concentration calculation and best curve fitting. It should have reporter and classification

laser with reporter detection, classification detector and double discriminator detector. It also should have fluidics cuvette channel with injection rate of 1 microlitre/sec and sample uptake volume of 25-200 microlitre. A suitable reader, microplate handler, fluid module with suitable software compatible for data analysis and electronic record keeping. Vendor should have a good service and application support back up in India to provide an effective application related troubleshooting for two persons. Location and duration to be clearly mentioned

D. UPS back up and dust free environment

1. Creation of dust free environment, renovation, air conditioning, installation, calibration of the modules, compatibility compliance, training, repeatable demonstration of the samples at NRCPB should be carried out by trained technical and service personnel.
2. A 20KVA on-line UPS with 4 hrs back up should be quoted separately for micro array set up.

General Terms and conditions:

1. Price of individual module should be quoted separately along with 3yrs on site warranty. In case of tie up for different modules warranty from the original manufacturer should be given.
2. Train two scientists for suitable duration (preferably 14 days) on individual (if applicable) modules or on entire setup for hands on operation in hard ware and soft-ware components. Location, module and duration should be clearly mentioned.
3. User list, arrays and other consumables for various applications in plants such as arabidopsis, rice, wheat, maize, sugarcane, barley, soybean, medicago, tomato, pea and microbes to run the initial experiments should be quoted. Capability to produce custom made arrays both for gene expression and genotyping applications for plants should be mentioned.
4. Separate technical and price bid should be provided.