

**Kusuma School of Biological Sciences
Indian Institute of Technology, Hauz Khas, New Delhi 110016**

August 27, 2012

Quotations are invited for the purchase of a **next generation sequencer / deep sequencer** for the Kusuma School of Biological Sciences. Interested suppliers are required to submit their quotations as per the specifications given below. The sealed quotations are to be submitted in two separate envelopes;

**A - for Technical Quote (Specifications) &
B - for Financial Quote**

(For details see Annexure I)

Both these envelopes should be enclosed in an outer envelope, which should also be sealed and addressed, clearly mentioning on top right corner of the envelope "**Quotation for next generation sequencer / deep sequencer**" due on **17th September, 2012**.

The quotations should reach the office of **Dr. Vivekanandan Perumal, Room No. 302, Kusuma School of Biological Sciences, by 5 PM on 17th September, 2012**

Institute reserves the right to accept or reject any of the offers without assigning any reasons.

Technical Specifications

1. The next generation sequencer should be optimized for all the following applications
de novo sequencing of small genomes
Custom amplicon sequencing
Small RNA sequencing
Custom enrichment
metagenomics
RNA-seq with robust quantitative information
ChiP-Seq with robust quantitative information
2. Authentic literature and proof for all the above-mentioned applications should be duly attached.
3. System should have a small footprint and should be offered as a single, integrated instrument capable of performing template amplification, sequencing, and data analysis (base calling, alignment, variant calling, and reporting).

4. The software required for applications in specification no.1 should be in-built or provided with the instrument. Free upgrades and a perpetual licence should be provided for the software.
5. Sequencing by Synthesis method using nucleotides with reversible terminators is preferred.
6. The sequencing chemistry should mimic natural biological chemistry with simultaneous addition of all four bases in the sequencing reaction for competitive addition to the DNA template.
7. The sequencing workflow should allow fully automated with walk-away operation, without user intervention, for template amplification to analyzed data on a single machine, and support unattended operation for at least 250 sequencing cycles.
8. System should offer greater than 6 Gb of high-quality data passing filter from > 250 bp paired or single reads to allow high throughput multiplexed sequencing of diverse genomes and greater than 25 million paired-end reads from a single run to enable robust counting applications, like RNA-seq and ChIP seq.
9. Sequence output should generate accurate base calls and high error free reads with greater than 85% bases with high quality Q30 score at 2x100 bp read length, derived directly from intensity data and not from a reference sequence-based, multiple-color encoding scheme.
10. Clonal amplification of DNA template should be accurate and should quantitatively reflect the amount of starting template. This step should be fully automated, without the involvement of emulsion PCR is preferred.
11. The sample preparation workflow should offer low sample input (for example FFPE DNA) and high throughput with robust multiplexing of multiple samples in a single run, such as highly multiplexed amplicon sequencing of greater than 200 amplicon targets per sample, totalling approximately 20000 amplicons for 96 samples in a single run.
12. Sample preparation for multiplexed amplicon sequencing should employ simple and user friendly workflow, and should enable preparation and unique indexing of 96 samples simultaneously starting from as little as 1 ng DNA input.
13. The custom amplicon sequencing workflow should be simple and should allow for easy probe design, capture of target region to sequence ready templates for fully automated downstream base calling and secondary data analysis for variant calling.
14. The sequencer should be able to read through at least 15 bases homo-polymer stretches in the genome accurately.
15. The sequencing chemistry should be robust and globally proven, as demonstrated with greater than 1000 peer reviewed publications. Documented publication for deep sequencing on mutation detection, miRNA, de novo sequencing is essential.
16. The sample preparation workflow should be simple, without the involvement of accessory hardware, and enabled in minimal turnaround time for sample to analyzed data.

17. The system should be offered with integrated paired-end fluidics on the instrument, supported with fully automated paired-end chemistry, without user intervention.
18. The data analysis module should enable real time, on-instrument image processing, base calling, read alignment and variant calling without the need for ancillary equipment.
19. System should offer the most user friendly sequencing experience, such as, intuitive touchscreen user interface, RFID tracking and pre-mixed/pre-filled integrated reagent cartridge for minimal user intervention.
20. The system should offer the option of seamless integration with cloud computing environment to avoid manual data transfer and analysis.
21. The vendor supplying the instrument should have its own fully functional next generation sequencing application support laboratory in India for efficient after sales service-support. The address of the application support lab should be clearly mentioned.
22. On-site training should be provided after the successful installation of the instrument.
23. Trained application / technical support personnel should be available help set-up 10-12 a year for the first 2 years.
24. Application support for data analysis should be provided for 1 year from the date of the first run on the instrument. Additional support for data analysis should be quoted separately as an optional item.
25. Any additional software improved analysis should be quoted as an optional accessory.
26. The vendor should also provide all consumables for the successful demonstration of all applications in the system (a minimum of 3-5 plates) for *de novo* DNA sequencing, RNA sequencing (transcriptome and miRNA), custom amplicon sequencing and ChIP-sequencing. The demo runs should be done as per the user convenience (upto 4 different time points).
27. Two high-end desktop computer with the following configuration (or a higher configuration) – i7 processor; 8 GB RAM; 1TB hard disk for data analysis. An UPS should be provided with each desktop computer.
28. A suitable branded UPS online (>2KVa) with 1 hour backup of the instrument should be supplied along with the instrument.
29. An appropriate instrument (as recommended by the manufacturer) for accurate quantitation and quality of the post-amplification template along with essential consumables to demonstrate functionality should be included in the quote.
30. An instrument capable of measuring A260 and A280 from 1-2 μ L of sample for checking the concentration and quality of nucleic acids in the pre-amplification template should be quoted as an optional accessory.
31. A complete list of accessory equipment required for performing all the applications on the next generation sequencer should be provided and each of them should be quoted as an optional accessory
32. A refrigerator for storage of samples (>300L) and a sonicator for sample preparation should be provided.

Annexure - I (Terms and conditions)

1. A minimum 4 years comprehensive warranty offered by the manufacturer (not the vendor) plus 1 year of AMC for all the equipments supplied as part of the quote with the exception of desktops and laptops and optional accessories.
2. Letter from the manufacturer specifically to quote for this tender is to be attached for authenticity of dealership/ agency and the dealer should be authorized service provider.
3. Vendor should get a fresh certificate directly from their product principal's clearly mentioning about warranty for four years on the systems to be delivered.
4. Special discount/ rebate wherever admissible keeping in view that the supplies made for educational purposes in respect of the public institution of national importance may please be indicated.
5. Vendors should attach the relevant product brochures for the model quoted.
6. Validity of the quotation should be at least three months.
7. Vendors will do the installation and demonstration of the equipment at IIT Delhi premises without additional charges.
8. Taxes, terms and conditions should be clearly mentioned.
9. In the case the items are proprietary products of the company, a proprietary item certificate stating the same may be provided.
10. A compliance statement for required specifications should be attached.
11. Payment terms and conditions should be clearly mentioned. No advance payment is encouraged by IIT Delhi.
12. The quotations for the equipment in foreign exchange, if it is to be imported. The cost of spares and optional equipment to be quoted separately. The cost should be based on FOB pricing. If equipment is indigenous, the quote should be in INR and all taxes applicable should be mentioned clearly. If the vendor offers special price for CIP New Delhi, it may be quoted separately from the FOB price.
13. Institute makes payment after delivery and successful installation. In case the payment terms are different, it should be mentioned clearly. If equipment is to be imported, the address of the company in whose name the LC is to be opened should be stated.
14. Firm MUST provide a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature with clear reference of page number, paragraph or lines. This statement must be signed, with the company seal, by the tendered for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification of the tender. The quotation should be complete in all respects (as per IIT-Delhi rules).

The Institute/ purchase committee has the right to accept or reject any bid or all quotations without assigning any reason whatsoever.

Sealed quotations in separate envelopes of Technical and Commercial bids kept in one sealed outer envelope (super-scribed "Quotation for next generation sequencer / deep sequencer") should be addressed to **Dr. Vivekanandan Perumal, Kusuma School of Biological Sciences, IIT-Delhi, Hauz Khas, New Delhi 110016** and should reach the **Kusuma School of Biological Sciences office, IIT-Delhi by 1700 hrs on 17th September, 2012.**

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