

**SÁLIM ALI CENTRE FOR ORNITHOLOGY AND NATURAL HISTORY (SACON)**  
**ANAIKATTY (POST), COIMBATORE - 641 108, TAMIL NADU**

The Director, Sálim Ali Centre for Ornithology and Natural History (SACON) invites tenders for **SUPPLY AND INSTALLATION OF AUTOMATIC DNA SEQUENCER SYSTEMS** as per the specifications given below :-

The mandate of National Avian Forensic Laboratory at SACON is currently focused on developing mitochondrial and nuclear signatures of birds and help law enforcement agencies in identifying bird species from any biological samples. Next-generation sequencing is proven to be one of the major cost effective tools for high throughput sequencing which will be used to develop species-specific DNA (mitochondrial and nuclear) signatures. Further, species identification services using only a couple of marker genes identified through high throughput sequencing would need a separate low throughput machine. Therefore, to set up a state of the art DNA sequencing facility as a core research facility, SACON requires the following DNA sequencing machines and related accessories capable of handling separately high throughput and routine (low throughput) species identification services.

1. High Throughput Next Generation Sequencing System - One
2. Low Throughput Sequencing System - One

Given below are the specifications for the above systems. The manufacturer quoting must specify that the machine should offer all the applications mentioned below in the respective specifications satisfactorily.

**TECHNICAL SPECIFICATIONS**

**(A) High Throughput Next Generation Sequencing System**

**TENDER NOTICE NO. 01/2018-19**  
**COST OF TENDER DOCUMENT : Rs. 12,000/-**  
**EARNEST MONEY DEPOSIT : Rs. 4,60,000/-**

1. The next-generation sequencing (NGS) system should be a bench-top model with minimal foot print and it should support a broad range of applications including forensic sequencing and whole genome sequencing of birds at publishable depth in a single run, complete de-novo sequencing and re-sequencing of higher eukaryotes including birds, mammals and plant genomes, CHIP sequencing, small RNA sequencing, transcriptome sequencing (birds, plants and mammals), among others. The above features should be supported by product/technical brochures/publications highlighted on point-to point basis. Preference would be given to the NGS sequencing machine/technique which has produced maximum number of more recent peer reviewed publications on the above mentioned applications.
2. The system should offer a high data output of 16-120GB or higher (at least 300 million clusters) in a single run, to support a broad range of applications.
3. Single instrument performs clonal amplification, sequencing, and primary data analysis (e.g. base calling). It is desirable for the instrument to perform paired-end runs.
4. For those who are offering paired-end chemistry it is desired to support a total read length of 150 base pairs or more.
5. The system should have a reasonable runtime to perform integrated massively parallel sequencing of DNA/RNA libraries loaded directly on the system. For those who are offering paired-end chemistry it should offer both single end and paired end sequencing.
6. The sequencing technology should offer accurate sequencing of homopolymers and repetitive regions in the genome of 20 bases or more and highest read quality score of Q30 for more than 80% of the base calls having >99% accuracy, ensuring quality control steps.
7. System should be able to sequence multiple samples at a time with option of using barcodes for sample multiplexing (up to 384).

8. The particular machine should be positioned with global dominance in NGS. It should produce high quality, accurate and highly mappable data publishable in tier one peer reviewed journals.
9. Apart from the list of equipment provided by the supplier (including the ones provided by the supplier and the others which are needed to be procured separately), there must be no other equipment needed to carry out high-throughput sequencing (the equipment supplied must be complete and capable of executing the entire process of sequencing without additional accessories). In case, if anything is needed and not specified by the supplier, it will be provided by the supplier at no additional cost.
10. The system should also include an option to integrate with the genomic computing environment, an easy, secure and cost-effective way to store, analyze, and share genomic data. The system should include latest software, hardware, accessories and technology available at the time of installation which is needed for generating high quality sequence reads. All the necessary kits, reagents and other consumables needed for the test run during installations will be provided by the supplier at no extra cost. All necessary kits, reagents and other consumables needed for training will be provided by the supplier at no extra cost.
11. The vendor should supply one 8 KVA branded UPS with at least 2-4 hour backup to run the instrument/on full load along with the system.
12. The vendor should include additional 2 yrs comprehensive warranty, i.e. manufacturer's warranty + additional 2 years (during warranty period, labour, spare parts and all other unforeseen expenses should be covered by the vendor). Two more years AMC should be quoted separately.
13. The system should be accompanied with a suitable server which will have the capacity to store, analyse and align de novo whole genome sequence data of multiple birds. Preferred specifications are: **Processor** - Intel Xenon Processor, Minimum 2 Processor with 12-18 Cores (thus a total 24-36 Cores), Clock speed of minimum 2.5Ghz; **Memory** - 1TB DDR4 2133MHz (16\*32GB) @ 2133Mhz or more (motherboard must support upgradation); **Hard Disc** - SSD 1TB X 1 (A - SATA = 3TB X 6 =18TB 3.5" SATA3 6Gbps 7.2KRPM HDD and B - SAS = 1TB X 2 = 2.4TB, 10K RPM); DVD write X 1; Nvidia GT Graphics Card x 1; Latest Intel Chipset; Intel 1217 & 1210 Gigabit Ethernet Controllers with Intel Remote Wake UP, PXE and Jumbo frames support; A 24TB NAS with RAID configuration 3+ from a provider such as Netgear good to keep the data sets and run data for archival; A network switch upgrade to 100Gbps from the machine to NAS/Server.
14. The warranty will commence only after the system is successfully installed, tested by trial runs and certified by the technical committee of SACON. SACON will be ready for installation as soon the system is received at our centre.
15. The vendor should make available their senior application scientist for first ten runs at SACON without any cost. The vendor must provide their senior application scientist's help in planning NGS experiments at SACON for next three years, and help develop custom amplicon panels and TSGNe based panels. The vendor should enable their local run manager off instrument software on SACON computer. The vendor should also provide comprehensive support on their supported workflows for targeted sequencing and variant calling application. The vendor should also enable software installation, and test data assembly and provide enablement on best practices and arrange bioinformatics data analysis training to SACON team.
16. The supplier must install the complete system at the space provided by SACON and demonstrate a successful installation using two complete test runs. The test runs must demonstrate the promised quality and output as specified in the proposal.
17. Adequate training by trained engineers and specialists using multiple complete run including data analysis, should be provided by the supplier to a few users at SACON including faculty, technical staff and some students, at no extra cost during both the installations. In addition, vendor should provide training as and when required without any cost. The details of trained engineer and specialist, clearly mentioning their experience of working with the supplier and handling a similar training in the past, should be provided with the proposal.

18. The vendor should undertake to supply the reagents to be used with the machine upon every demand raised by the users for at least 5 years from the purchase of the machine even if the machine becomes obsolete and discontinued.
19. The vendor should undertake to supply the spare parts (both critical and others) to be used in the machine upon every demand raised by the users for at least 5 years from the purchase of the machine even if the machine becomes obsolete and discontinued.
20. The vendor should ensure proper and smooth functioning of the equipment by supplying appropriate product care which includes full coverage for parts, labour and travel; Reagent replacement upon hardware failures; zero product maintenance; Remote Technical Support; 5 business day average on-site response; hardware/software updates; On-site applications support.
21. If the downtime of the machine exceeds two weeks after the information of malfunctioning or trouble in the instrument is communicated to the vendor, then the vendor will be penalized.
22. The vendor should supply following ancillary items along with main system equipment i.e. Next Generation Sequencing System as facility on turnkey basis:
  - (a) DNA fragmentation device for genomic DNA library preparation for sequencing: The device should be Bench-top and high intensity acoustic transducer. Device should have treatment power range around 70 Watts peak incident power and 20 Watts average incident power. Device should treat single sample at a time.
  - (b) Automated electrophoresis for genomic DNA library size estimation: The device should handle multiple samples at a time. It should have resolution of 3bp. It should be able to quantify DIN and RIN values for DNA and RNA. Should have suitable software to perform all DNA, RNA and fragment analysis.
  - (c) Magnetic stand 16 well: Performs efficient magnetic separation of paramagnetic beads in working volume: 10–2,000 µL, holds up to 16 standard 1.5–2 mL microcentrifuge tubes.
  - (d) Magnetic stand 96 well: Perform paramagnetic bead precipitation from standard 96-well, U-bottom microplates and 0.2 mL PCR plates with no additional accessories in easy and fast magnetic separation in as little as 30 seconds.
23. A rate contract for all the consumables (including kits and panels) should be made.
24. Vendor should provide a certificate from manufacturer that the supplied machine is brand new and not a refurbished item.

**(B) Low Throughput Sequencing System**

**TENDER NOTICE NO. 02/2018-19**  
**COST OF TENDER DOCUMENT : Rs. 5,000/-**  
**EARNEST MONEY DEPOSIT : Rs. 1,40,000/-**

1. Equipment must be a compact single integrated unit. Should perform advance fully automated multi-capillary, fluorescence-based DNA Sequencing analysis.
2. Equipment should be a licensed version and the vendor should quote user license to perform the sequencing reaction.
3. Equipment should be able to do high performance sequencing reaction with wide range of chemicals and chemistry, not specific to any company. The consumables should be available through multiple vendors or authorized distributors.

4. Equipment should come with 8 or more capillaries in parallel. Employ capillary arrays that use bare silica capillaries with a usage life that exceeds 160 runs. The system should have an option to upgrade to more capillaries to meet future throughput necessities.
5. Equipment should have the capacity to perform Forensic sequencing, serial analysis of gene expression sequencing, expressed sequence tag sequencing, gene regulation studies, microbial diversity analysis, epigenetic change analysis, genome analysis as well as re-sequencing. Machine should have a provision to validate serial analysis of gene expression results.
6. Equipment should have noise free CCD detection technology and a spectrograph for colour separation.
7. Equipment should have the ability to detect and analyse 6 or more fluorescent dyes simultaneously for DNA fragment analysis.
8. Equipment should come with single line 505 nm Solid State long life laser, utilizing a standard excitation source with power supply and without heat removal ducting.
9. Equipment should have signal uniformity and sensitivity with dual side illumination detection. It should be active at various temperatures in the range between 18 to 70° C.
10. Equipment should have option for different capillary sizes for smaller fragment and large fragment sequencing analysis.
11. Equipment should come with automatic Radio-Frequency Identification (RFID) Technology to track key consumables data. In addition, the equipment should have the option to overcome the expiry date based bugs to run the system.
12. The vendor should supply all the necessary softwares for de novo, contig assembly, Re-sequencing, Long Read Sequencing, comparative sequencing, fragment analysis applications like SSR, ISSR, AFLP, HMA (Heteroduplex Mobility Assay), microsatellite, SSCP, SNP validation and screening, linkage analysis, LOH (Loss of Heterozygosity).
13. The software should allow real-time data quality evaluation providing immediate access to base-calling or size-calling data to make decision about the quality of data as it is generated.
14. The supplier should perform installation free of cost and operator training should be provided by a vendor service engineer. Local service engineers, regional technical support/applications training, on-site, in-lab customer training and technical phone support should be made available free of cost.
15. In addition, supplier should arrange operator training and two levels of application training for a minimum of 6 users.
16. Equipment should come with three years (1+2) comprehensive warranty.
17. Vendor should provide a certificate from manufacturer that the supplied machine is new and not a refurbished product.
18. If the downtime of the machine exceeds two weeks after the information of malfunctioning or trouble in the instrument is communicated to the vendor, then the vendor will be penalized.

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Interested persons are to submit the completed tender documents at SACON by 05.00 p.m. on 17.05.2018.

**FOR ANY CLARIFICATIONS, PLEASE CONTACT:-**

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