1. "A real-time PCR amplification/detection system for HPV genotyping and oncology parameters like BRAF, KRAS and EGFR"

1. The system should be USFDA and CE-IVD approved for screening and detection of HPV 16 and HPV 18 genotype along with detection of 14 high-risk human papillomavirus types (31, 33, 35, 39, 45, 51, 52, 56, 58,59, 66 and 68) in a single analysis.

2. The system should be fully automated for sample preparation/extraction combined with automated amplification and detection by Real time PCR technology.

3. The system should be able to screen at least 180 samples per day (8 working hour).

4. The system should be peltier based 96 well real-time PCR designed for both in-vitro diagnostic (CE-IVD) and open applications.

5. System should offer at least 5 excitation and 5 emission filters with fast amplification and fixed optics for detection of SYBR, FAM, HEX, VIC, JOE, TAMRA, etc.

6. Licensed and authorized Real-time PCR platform should be supplied along with the licensed software for HRM, Simple probes, Taqman Chemistry, Hybridization probes

7. The system should offer clinically validated HPV assay which can be used as a primary screening test without PAP cytology for Cervical Cancer screening.

8. The system should have multiple inbuilt features to prevent/minimize contamination like U.V light, UNG enzyme, CORE tip technology etc. The system shall have effective enzymatic contamination control (i.e. uracil-N-glycosylase) to allow the flexibility for the sample processing instrument and the real-time PCR analyzer to be operated either in one room or separate rooms

9. The instrument shall perform automated sample extraction and PCR reagent setup without any user intervention.

10. The instrument shall incorporate the total aspirate and dispense monitoring mechanism to monitor every liquid handling step to detect clogs and ensure liquid volume is accurately pipetted every time.

11. The system should offer Human Papillomavirus (HPV) detection and simultaneous genotyping assay. The assay should also incorporate an internal control to monitor the entire process from fully automated extraction to result interpretation.

12. The system should be capable of processing multiple specimen types directly from liquid-based cytology (LBC) vials.

13. System should accommodate the addition of laboratory-developed protocols to the existing test menu. The system should have a well-defined pre-analytical workflow and automate result interpretation

14. The system should offer US-FDA approved common assays like KRAS, BRAF and EGFR mutation tests along with HPV.

15. The system should offer approved microbiology assays for CT/NG, MRSA/SA, HSV1/HSV2 and C.difficle.

16. The company should be able to supply the reagents for the essential experiment in open channel.

17. Should come with the latest version of compatible Desktop/Laptop and compatible UPS with 1 Hr Backup.

2. "Automated multiplex PCR system with panels - respiratory panel, blood culture identification panel, gastro-intestinal panel, encephalitis/meningitis panel"

1. Molecular system should be based on nested PCR technology and detection by DNA microarray technology.
2. The detection should be based on dye hybridization and high resolution melting curve analysis (HRM).
3. Reports should be generated automatically without setting any threshold or manual base line adjustments.
4. System should be able to do the comprehensive multiplex infectious syndrome based testing at one go (comprehensive panels) such as respiratory pathogens panel, gastrointestinal pathogens panel, blood culture pathogens panel and meningitis pathogens panel.
5. System should be very compact and should not require molecular setup or infrastructure such as per PCR area, amplification area and post PCR area.
6. Should have minimum manual hands on time less than 5 min and results should be available within 90 mins.
7. Gastro intestinal panel should detect bacteria, viruses as well as protozoa, especially for organisms like - vibro, V cholera, shigella , diarrheagenic, E. coli, rota virus, entamoeba, cryptosporadium etc. directly from stool samples.
8. Blood culture ID should detect most common gram positive , gram negative bacteria and fungus (yeast) with antibiotic resistance genes especially- mecA , vanA/B and KPC.
9. Respiratory panel should combine- viral and bacterial targets directly from nasopharyngeal swab.
10. Pneumonia panel should be a semi quantitative test, which should include antibiotic resistance genes especially, ESBL: CTX-M, Carbapenemases: KPC,NDM, Oxa48-like, VIM,IMP, Methicilin Resistance : mecA/mecC and MREJ.
11. Reagents (kit) should have US FDA / DCGI/ CE-IVD certification.

3. "Mass Spectrophoto- meter (Maldi TOF MS)"

Technical Specifications of MALDI TOF/TOF MS: -

The MALDI-TOF/TOF MS instrument having features to deliver highest quality performance in resolution, sensitivity and mass accuracy for comprehensive proteomics applications.

[A] Complete Molecular Characterization and analysis of Metal-organic complexes, Oligonucleotides, PNA-DNA Hybrids, Polymers, Dendrimers, Supramolecular assemblies e.g., Synthetic Metalloporphyrins, Phthalocyanines and multiporphyrins and a Specialized software to determine Molecular mass, End group analysis ,co-polymer study and impurities.

[B] The system should be capable of performing the identification of intact protein, protein/peptide identification and characterization, protein biomarker research, PTM identification and analysis, de novo sequencing, gel based

and non-gel based applications, quantitative proteomics including label free and labelled (iTRAQ, ICPL,SILAC etc.) studies, MALDI ISD analysis, glycan analysis and biopolymer analysis.

[C] Further, the system should be capable of both positive and negative ion detection and MS/MS applications.

Advanced & latest systems with all the accessories required to carry out all the above applications along with all applicable application software with perpetual licenses. Relevant literature and publications that support the quoted model's ability to perform all of these capabilities must be included.

General Specifications:

1. System Hardware Specifications	• It should be operational in Linear, Reflector and MS/MS mode (TOF/TOF Configuration). • Capable of TOF/TOF uses (MS/MS mode operation with gas collision cell). • Active video viewer and scanning of the target under acquisition. • MALDI plates are to be of Industry standard and have compatibility with LC and autos potter. • Unwanted Mass/Mass range suppression. Quantification of mass peaks. • High speed data digitizer (2 GHz or higher). • The ion refocusing region and detector with latest technology to better refocus the ions on the detector plane (necessary for higher mass accuracy) with a fast detector coupled to fast electronics for high digital sampling rate.
MASS ANALYZER	• The instrument should employ TOF/TOF optics technology for highest resolution and sensitivity. • The system should be capable of performing intact protein mass identification, peptide mass fingerprinting, and precursor ion selection followed by high energy fragmentation to generate high resolution MS/MS spectra. • High sensitivity in both linear and reflector mode (pmol range or better) fragmentation at high sensibility and High energy (CID) and ISD.
MALDI ION SOURCE	• MALDI High repetition stable laser (1Hz – 50 Hz or higher) in both modes with capability to focus to 10 micron diameter or better. • The laser should have pulse energy 30 µJ or higher with long laser life 2 million shots or higher. • Collision Induced Dissociation (CID) facility with high collision energy for both type of ions. • User friendly cleaning of ion source. • A good quality pulse extraction source.
MODES OF OPERATION	The system should be operated in the following modes. **LINEAR Mode** • Measureable mass range in this mode: ≥ 100 kDa. • Minimum sensitivity for MS: 250 amol or better. • Mass Accuracy in this mode: Better than 90 PPM. **REFLECTRON MODE**

	• Mass Accuracy: ≤5 ppm with Internal Calibration. • Mass Accuracy: ≤50 ppm with External Calibration. • Minimum sensitivity: 250 amol or better with adequate S/N. **MS/MS mode** • The instrument should be capable of TOF-TOF mode and this mode operates with gas collision cell. • Mass resolution (M/ΔM): isotopic resolution of fragments should be achievable. • Minimum sensitivity: 2.5 fmol or better • Minimum measurable mass: 100 Da or less

Data System and Software, WorkStation should have:

a) Softwares related to Protein identification and characterization, de novo sequencing, protein/peptide quantitation (labelled & label free), PTM's discovery including glycan analysis and other proteomics application along with the intact molecular weight determination must be supplied. Capable of automated MS or MS/MS analysis.

b) Softwares supplied must be capable of molecular characterization and analysis of Polymers, Dendrimers and Supramolecular assemblies, oligonucleotides and PNA- DNA Hybrids.

c) Data processing software shall be compatible with data base search engines such as MASCOT or equivalent and relevant interfacing must be provided. This shall also be linked to protein annotation and classification databases.

d) High performance workstations (two in number: one for data acquisition connected to instrument and second for offline data analysis with connectivity to internet) with 24 inch LED monitor, a minimum of 1 TB storage space and high end graphic card with adequate memory and all interfacing software and hardware shall be included. Both computers shall have same specifications and these should be submitted along with the technical bid. An additional 4 TB external storage drive with networking capabilities must be provided. A total number of 5 or more user licenses shall be included.

e) Operating system shall be windows 7 or higher and the instrument firmware shall be upgradable. In case a previous version i.e. Windows XP is provided vendor must submit an undertaking that vendor takes complete responsibility of timely up gradation of the system within 2 years. Also vendor shall submit in the writing that all upgrades (software, firmware and hardware if any) up to windows 10 OS will be provided free of cost as soon as they are developed.

f) Suitable duplex B&W LAN enabled Laser printer should be provided.

g) Quoted System should have Remote Service facility for the immediate diagnosis and troubleshooting by the Vendor's Service Support team.

Other Items:

a) A complete online 10KVa UPS system including Servo Stabilizer with minimum 3 hrs backup for uninterrupted data acquisition.

b) One Helium and two nitrogen gas cylinders with appropriate levels of purity as needed for the safe and efficient operation of the instrument along with the regulator and all necessary accessories such as gas lines, connectors etc. should be quoted. Nitrogen cylinders shall be quoted with switchover system to ensure the uninterrupted gas supply in emergency situations.