



| Running Contract Details       |                            |
|--------------------------------|----------------------------|
| Equipment Name                 | Tandem Mass Spectrometer   |
| Running Contract Valid Till    | 27-11-2025                 |
| Tender Ref No                  | KMSCL/EP/T497/1669/2023    |
| Tendered Quantity              | 3                          |
| Supplier Name                  | M/s Triune Solutions Inc., |
| GST No                         | 29AAGFT6307H1ZZ            |
| Installation & Delivery Period | 8 Week(s)                  |
| Up-time / PM vist              | 95% & 4 Visits per year    |
| Warranty period                | 3 Years                    |

| Supplier`s Details  |                 |                           |
|---|-----------------|---------------------------|
| Address   | Contact Details |                           |
| Sai Green Apt S-14<br>2nd floor<br>Babusapalya<br>Opp chellkere Lake<br>Kalyan Nagar Bangalore-560043 | Contact Person  | Mr. Suresh Babu           |
|   | Phone           |                           |
|   | Mobile No       | 9844073864                |
|   | Email           | sureshbabu@triunesoln.com |

| Item-wise Price Details |   |   |                                    |             |
|-------------------------|---|---|------------------------------------|-------------|
| #                       | Item Details  | Unit Rate<br>(Incl.all taxes & charges) | Service Charges<br>(Through KMSCL) | Grand Total |
| 1                       | <b>Tandem Mass Spectrometer</b><br><i>Model &amp; Make : XEVO TQ-S Cronos/ WATERS PACIFIC PTE LTD</i>   | 14348800<br>Incl.GST :18%               | 1004416                            | 15353216    |
| 2                       | <b>"Kit to detect Inborn errors of metabolism: Amino acids - Standard Pack size and Rate to be mentioned"</b><br><i>Model &amp; Make : 250Test/Pack</i>               | 184375<br>Incl.GST :12%                 | 13597.66                           | 197972.66   |
| 3                       | <b>"Kit to detect Inborn errors of metabolism: Fatty acid acyl carnitine - Standard Pack size and Rate to be mentioned"</b><br><i>Model &amp; Make : 250Test/Pack</i> | 184375<br>Incl.GST :12%                 | 13597.66                           | 197972.66   |
| 4                       | <b>"Kit for Succinyl acetone, Nucleosides and Lysophospholipids - Standard Pack size and Rate to be mentioned"</b><br><i>Model &amp; Make : 250Test/Pack</i>          | 125000<br>Incl.GST :12%                 | 9218.75                            | 134218.75   |

| Item-wise Price Details                              |   |                      |                      |                         |                      |                      |                       |
|--|---|----------------------|----------------------|-------------------------|----------------------|----------------------|-----------------------|
| 5  | <b>"Kit for Vitamin D analysis- Vit D2 and D3 determination and vitamin D metabolite analysis - Standard Pack size and Rate to be mentioned"</b><br><i>Model &amp; Make : 250Test/Pack</i>  |                      |                      | 125000<br>Incl.GST :12% | 9218.75              | 134218.75            |                       |
| 6  | <b>"Kit for analysis of pain management drug Methadone and its metabolite from DBS - Standard Pack size and Rate to be mentioned"</b><br><i>Model &amp; Make : 250Test/Pack</i>   |                      |                      | 187500<br>Incl.GST :12% | 13828.12             | 201328.12            |                       |
| 7  | <b>"Kit for Steroid panel of min 10 steroids (of diagnostic value). - Standard Pack size and Rate to be mentioned"</b><br><i>Model &amp; Make : 250Test/Pack</i>  |                      |                      | 250000<br>Incl.GST :12% | 18437.5              | 268437.5             |                       |
| 8  | <b>"Kit for analysis of Methotrexate an anti-cancer and immunomodulator drug - Standard Pack size and Rate to be mentioned"</b><br><i>Model &amp; Make : 250Test/Pack</i>   |                      |                      | 100000<br>Incl.GST :12% | 7375                 | 107375               |                       |
| 9  | <b>"Kit for femtogram level detection for testosterone hormone - Standard Pack size and Rate to be mentioned"</b><br><i>Model &amp; Make : 250Test/Pack</i>   |                      |                      | 250000<br>Incl.GST :12% | 18437.5              | 268437.5             |                       |
| 10   | <b>"Kit for quantitation of biotherapeutics peptide from human plasma such as Angiotensin I &amp; II, Neo- endorphin, Arg-Vasopressin. - Standard Pack size and Rate to be mentioned"</b><br><i>Model &amp; Make : 250Test/Pack</i> |                      |                      | 500000<br>Incl.GST :12% | 36875                | 536875               |                       |
|  |   |                      |                      | <b>16255050</b>         | <b>1145001.94</b>    | <b>17400051.94</b>   |                       |
| Annual / Comprehensive Maintenance Charges (Exl.Tax) |   |                      |                      |                         |                      |                      |                       |
| Rate   | 4 <sup>th</sup> Year  | 5 <sup>th</sup> Year | 6 <sup>th</sup> Year | 7 <sup>th</sup> Year    | 8 <sup>th</sup> Year | 9 <sup>th</sup> Year | 10 <sup>th</sup> Year |
| <b>Tandem Mass Spectrometer</b>                      |   |                      |                      |                         |                      |                      |                       |
| Labour   | 3,50,000.00   | 3,50,000.00          | 3,75,000.00          | 3,75,000.00             | 4,00,000.00          | 4,00,000.00          | 4,25,000.00           |
| Comprehensive  | 9,00,000.00   | 9,90,000.00          | 10,89,000.00         | 11,97,900.00            | 13,17,690.00         | 14,49,459.00         | 15,94,404.00          |

### Other terms & conditions

1. The supplier shall execute an agreement with the purchaser as per tender conditions (agreement format is given in the tender document).
2. The supplier shall submit performance security amounting to 5.00% of the value of the supply order.
3. The labour & comprehensive charges of equipment after the completion of warranty period is finalized by KMSCL as mentioned above.
4. Since discount rate is not applicable for equipment under Running Contract of KMSCL, purchase/supply order can be issued directly to supplier at the given rate with tax & other charges (exclusive of KMSCL service charges).
5. If purchase/supply order is issued directly to the supplier, KMSCL service charge need not be paid. But the copy of the said order may be forwarded to KMSCL for information.

## Technical Specification

### Equipment : Tandem Mass Spectrometer

#### Tandem Mass Spectrometer(LC-MS/MS System inclusive of all accessories)

1. A compact Triple Quadrupole LC-MS/MS system for routine analysis with high though put automated Auto sampler and suitable software for system control, operational and data analysis & reporting.
2. It should be with all the essential components for making the system fully functional such as UHPLC system, Nitrogen Gas Generator and all accessories, consumables & equipment with software.
3. Instrument should be well suitable for various Qualitative and Quantitative analysis of various analysis which includes New Born Screening (NBS), Inborn Error of Metabolism (IEM), Steroid, Biomarker assays, lysosomal storage disorders and other suitable Lab Developed Test method and other clinical applications.
4. Should have user-friendly Complaint Software should control both the Autosampler, LC Pump and MS instrument without the need for multiple operations.
5. It should be a modern machine that utilizes the newest technology and advancements, with a market age of no more than half a decade

#### A. TRIPLE QUADRUPOLE LC-MS/MS SYSTEM

The MS system should be a Tandem Quadrupole MS system, capable of carrying out MS and MS/MS experiments.

The instrument should have the following minimum specifications

1. Mass Range: 5-2000 m/z or better
2. Resolution: Unit mass FWHM (Full Width Half Maximum) < 0.7 or better
3. Mass Stability: 0.1 Da over 24 hours or better
4. Sensitivity:
  - a) MRM ESI Positive mode: 1pg/ $\mu$ L on column reserpine should give S/N greater than 3,00,000 :1 based on 1 $\mu$ L injection volume or better.
  - b) MRM ESI Negative mode: 1pg/ $\mu$ L on column Chloramphenicol should give S/N greater than 30,000 :1 based on 1 $\mu$ L injection volume or better.

OR

- a. IDL should be ? 2.25 Femtogram for both Reserpine and Chloramphenicol for 10fg or better
5. Scan Speed: Should have the scan speed minimum 20,000 Da/s or above
  6. Source Interface:
    - a. The interface should be such that it should be able to handle large batches of complex sample matrices over a long period of time without performance degradation.
    - b. The cleaning of the sampling cone within the source should be simple & should be done without venting the system.
    - c. ESI Ionization Source or similar efficient technology capable of avoiding interference from solvents and other extraneous matter.
    - d. Interface capable of ambient temperature operation and without complex apertures to maintain structural integrity of thermally labile and fragile molecules without losing sensitivity.

**7. Polarity Switching time:** Switch from positive to negative polarity in **20 msec or better**. Lower Switching time is preferred.

#### **8. Vacuum System:**

- a. Robust high efficiency vacuum system with minimum maintenance
- b. Vacuum read backs must be digitally monitored and controlled through software to ensure fail-safe operation in the event of power failure.
- c. All accessories required for the proper functional of the vacuum system should be included.

## 9. Quadrupoles:

- a. High quality mechanical tolerance and minimum co-efficient of thermal expansion for high standard of mass stability in varying lab temperature conditions.
- b. Support to minimise ion losses for better sensitivity in ion optics.
- c. Enhanced transmission with the ions actively transferred into the mass analyser, improving sensitivity and robustness.

## 10. Collision Cell:

- a. To allow very low dwell times allows inter channel delays (1 milliseconds or better) without sacrificing sensitivity.
- b. Eliminate cross talk to enable multiple MRM studies with a single run.
- c. Fast data collection of at least 500 MRM data points per sec or better without compromising performance.
- d. MS and MS/MS along with matrix monitoring to be performed in single run.

**11. Gas Control:** All gases must be controlled by the software.

**12. Dynamic range:** 5 orders of magnitude or better

## 13. Operating modes:

Mass spectrometer should have the following scan options

- a. Full scan
- b. Selected Ion monitoring/ recording (SIM/SIR)
- c. Product ion scan
- d. Precursor ion scan
- e. Neutral loss scan
- f. Multiple Reaction Monitoring (MRM)
- g. MS and MS/MS in a single injection with matrix background monitoring.
- h. Simultaneous full scan and MRM

## 14. Detector:

- a. A high sensitivity, high throughput detector with zero dead time, low noise and high accuracy at low level detections.
- b. An off-axis dynode photomultiplier/Electron Multiplier detector
- c. Detector/CEM/ Discrete-dynode detector and it must operate in both positive and negative ion modes **and detector life should be minimum 10 years.**
- d. Capable of switching polarity rapidly.

## 15. Nitrogen Generator & Other gas:

- a. The system should be with N generator inbuilt or should be supplied with compatible system with fully functionality and trouble free inbuilt compressor and appropriate capacity reservoir which should be sufficient enough to deliver the gases required to run the system
- b. Should be complete with all necessary accessories
- c. In case for Argon Gas requirement, should include minimum 1 gas cylinder with all necessary fittings

## 16. Computer and Operating system:

A compatible high performance computer with core i5 or better processor, 32 GB Ram, 1 TB Hard disk, DVD Writer, 25" led monitor, Window 10 Operating System (or higher) with Laserjet Printer should be supplied.

## 17. Workstation Software:

- a. Software must be Multitasking type. It must acquire and process the data simultaneously
- b. Software should be capable of Data acquisition, calculations and flagging. Also sample based result processing and Instrument calibration and tuning.
- c. Automated calibration and quantitative optimization.
- d. All software required for New Born Screening (NBS), Inborn Error of Metabolism (IEM) must be included
- e. Should be able to control LC, Detector and auto sampler.

- f. It must be able to regulate the gas pressure and flow during the data acquisition and append to the relevant data file.
- g. Software must have automated calibration and Quantitative optimization.
- h. Automated MS to MS/MS switching during a single run with user selectable criteria.
- i. Technology for the system optimization and status monitoring, performing the following parameters.
- j. System parameters checks and alerts
- k. Integrated sample/calibrant delivery system and programmable divert valve.
- l. Automated mass calibration
- m. Automated sample tuning
- n. Automated SIR and MRM method Development
- o. MS and MS/MS in a single run.

#### 18. Method Package:

The vendor should provide method packages providing readymade methods for LC and MS parameters and MRM transitions for various applications as follows.

- a. Neonatal Solution for newborn screening using a tandem mass spectrometer (LC/MS/MS) enables the simultaneous measurement of 20 or more indicator substances, such as amino acids and acylcarnitine. Should supply minimum of 100Nos ready to use kit for NBS.
- b. Primary metabolites- The method package must include complete method of analysis of minimum 100 number of metabolites covering major metabolic pathways associated with different clinical conditions.

### **B. ULTRA HIGH PERFORMANCE LIQUID CHROMATOGRAPHY SYSTEM**

#### **1. Pump:**

- a. Quaternary Gradient System
- b. Pressure tolerance up to 14,000 psi or better
- c. Online membrane Vacuum Degasser – 5 channel
- d. Operating flow range: 0.010-2.0ml/min with 1µl increments
- e. Plunger seal wash integral, active, programmable
- f. Gradient profiles
- g. Flow Accuracy:  $\pm 1.0\%$  or better
- h. Flow precision: 0.075% RSD or better

#### **2. Auto Sampler with Sample Cooler:**

- a. Number of samples: **96Nos of 1.5mL/2ml** vials (or similar sample holder) or equivalent
- b. Pressure tolerance 14,000 psi or better
- c. Injection volume range: 0.5µl in 0.1µL increments or better.
- d. Sample delivery precision: <0.3% RSD or better
- e. Sample temperature: 5-40°C or better
- f. Sample carry over < 0.05% or better
- g. It should have sample pre-treatment function

#### **3. Column Oven with Heating and cooling Capability:**

- a. Column oven to accommodate at **least two columns** of 25 cm length each.
- b. Column temperature control 5°C above ambient to 80°C or better.
- c. Column Tracking & Storage Device/**similar utility** should be provided

#### **4. Column to be offered Along with the system:**

- a. 1 No. C 18 Column, 1.9 micron or better (compatible)
- b. 1 No. of C 18 Column 5 micron (or better) [compatible]
- c. 1 No. C 8 Column 2-2.5 micron (or better) [compatible]

#### **5. Flow Divert Valve:**

Should be compatible and fully functional to the MS unit

#### **6. Installation & Demonstration:**

- a. IQ/OQ/PQ to be performed as per OEM Protocol. Should be done free of cost with necessary traceable standards along with necessary performance kit standard solutions.
- b. Documents, kits & standards etc, as required being supply along with the instrument and should not be used from “Method Package” mentioned above (the items listed in method package should be supplied separately and should not be used for installation or demonstration purpose).

#### **7. Training:**

- a. Basic training for a period of one week after installation and commissioning of the equipment to technical personnel to be provided at onsite.
- b. There should be minimum two basic pieces of training namely installation training and after few months advanced application training every 6 months on a mutually convenient date.

#### **C. UPS and others:**

- a. A branded UPS system with built in Isomer Transformer, SMF Batteries of appropriate capacity (with minimum backup of 1 hr) and input/output phases as per requirement of the LC MS/MS System.
- b. Any gas cylinder (1 No) which is required for collision induced dissociation/fragmentation should be offered with pressure regulators and SS fittings.

#### **D. Tentative list of kits**

##### **a. Columns & Sample preparation system**

##### **b. Inborn errors of metabolism (Tier 1) IVD approved All for analysis of**

1. IVD approved kit for the analysis Amino acids (Ala, Arg, ASA, Citru, Gln, Glu, Gly, Leu / Isoleu / Pro-OH, Meth, Orn, Phe ala, Pro, Tyr, Val,)
2. IVD approved kit for the analysis Amino acids (Ala, Arg, ASA, Citru, Gln, Glu, Gly, Leu/Isoleu/Pro-OH, Meth, Orn, Phe ala, Pro, Tyr, Val,)
3. Fatty acid acylcarnitine (C0, C2, O3, C3DC/C4OH, C4, C4DC/C5OH, C5, C5:1, C5DC/C6OH, C6, 6DC, C8, C8:1, C10, C10:1, C10:2, C12, C12:1, C14, C14:1, C14:2, C14OH, C16, C16:1, C16OH, C16:1OH/C17, C18, C18:1, C18:2, C18OH, C18:2OH, C20, C22, C26)
4. Succinyl acetone,
5. Nucleosides
6. Lysophospholipids
7. Maple syrup urine disease
8. Methylmalonic acidemia
9. Propionic acidemia
10. Congenital adrenal Hyperplasia
11. Pompe
12. Krabbe
13. X-ALD
14. Measurement of isobaric C5 Acylcarnitines in dried blood spot

**c. Kit for the determination of enzyme activity for the biomarkers of (Gaucher Disease, Niemann-Pick A/B Disease, Pompe Disease, Krabbe Disease, Fabry Disease and MPS 1 Disease)**

##### **d. Other Clinical Applications**

1. Vitamin D analysis- Vit D2 and D3 determination and vitamin D metabolite analysis in serum
2. Analysis of pain management drug Methadone and its metabolite from DBS
3. Analysis of flaxseed metabolite in preclinical research on mice.
4. Steroid panel of 10 steroids.
5. Analysis of pheochromocytomas tumor markers viz Metanephrine (ME) and Normetanephrine (NME) from serum.
6. Analysis of phthalates exposure to human body from plastic.
7. Analysis of Methotrexate an anti-cancer and immunomodulatory drug from human serum
8. Analysis of pain management drug from urine (Drug of abuse: Fentanyl, Norfentanyl, Pentazocine, Meperidine)
9. Femtogram level detection for testosterone hormone
10. Quantitation of biotherapeutics peptide from human plasma such as Angiotensin I & II, Neo-endorphin, Arg-Vasopressin.

#### **E. Reagent Calculation**

- a. The rate for each kit (Rate to perform 1 reportable test) shall be quoted in the BOQ. The rate offered for each parameter shall include the no. of tests required for the calibrations
- b. For each kit, the standard pack size and the rate for the same shall also be mentioned in the BOQ. This rate will be fixed for 5 years from the date of price bid opening.
- c. Available pack sizes of each kit should be mentioned in the Offer Form. The rate offered in the BOQ shall be applicable to all pack sizes. If any of the smaller pack size available with the company is not offered in the offer form then suitable action will be taken against the firm including disqualification from the tender.
- d. The workload considered for L1 calculation is as follows;
  1. 500 reportable tests (all kits ) in 90 days
  2. Cost per reportable test should be offered by including the cost of number of tests used for calibration in 90 days.
  3. For L1 calculation, the following calculation shall be used = Equipment Cost incl. of GST + Cost of 10000 tests (2000 tests x 5 year)
  4. All reagents supplied shall have minimum 80% of the shelf life at the time of supply. Reagents of lower shelf life, if supplied, shall be replaced free of cost on request by the user.
  5. All Controls, Calibrators & Consumables required to perform the tests should be supplied free of cost along with the reagent.

Note: Warranty exclusions if any shall be discussed at the time of prebid meeting else the tender condition as per clause 6.31.20 shall prevail