# EXPRESSION OF INTEREST ( E.O.I )

**for**

# Supply of Bioreactor System

**CSIR-INSTITUTE OF HIMALAYAN BIORESOURCE TECHNOLOGY**
**(Council of Scientific and Industrial Research)**
**Post Box No.6, Palampur -176061, Himachal Pradesh (INDIA)**
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## EXPRESSION OF INTEREST ( EOI )

CSIR- Institute of Himalayan Bioresource Technology ( CSIR – IHBT ) Palampur, HP, India is one of the premier laboratories under Council of Scientific and Industrial Research, an autonomous body under Department of Scientific and Industrial Research (Government of India), New Delhi.

Situated among pristine environ in the lap of Dhauladhar ranges, CSIR-IHBT is the only laboratory of the Council of Scientific and Industrial Research in the State of Himachal Pradesh (H.P.), India. Institute has a focused research mandate on bioresources for catalysizing bioeconomy in a sustainable manner.

The institute has: state-of the art laboratories; remote sensing and mapping facilities; internationally recognised herbarium; animal house facility; pilot plants in nutraceuticals, essential oil and herbals; farms and polyhouses. The young and dynamic team of scientists propel the research and work dedicatedly to discover and find solutions to new challenging problems faced by the society. International collaborations further strengthens scientific interactions at a global scale. Promoting industrial growth through technological interventions is a constant endeavour and several technologies developed by the institute are transferred to industries. For socio- economic upliftment, regular training programmes and advisory services are rendered to farmers, floriculturists, tea planters and small entrepreneurs involved in food processing sector. Institute has been recognised as one of the Incubation Centres by MSME GoI and in the area of Affordable Health Care by DSIR. Institute encourages industries to share the technological problems faced them, such that efforts could be made in developing a viable solution. Confidentiality is strictly maintained.

Work on plant adaptation studies and high altitude medicinal plants are further strengthened by the field lab "Centre for High Altitude Biology (CeHAB) situated at Ribling in Lahaul & Spiti district of H.P. Through this centre, institute disseminates technologies by way of trainings and demonstrations that could transform the economy of the region and help in solving unique challenges faced by them.
Institute fosters student-scientist interaction and school children are welcome to visit the Institute. Post graduate students can do project and sharpen their research skills at CSIR-IHBT. Young researchers are welcome for to do Ph.D in cutting edge areas under the able guidance of expert faculty.
Institute passionately contribute its bit in the development of society, industry and environment.

With the above back ground, An Expression of Interest (EoI) is initiated at CSIR- IHBT with the prospective manufacturers, their authorized channel partners or agents/suppliers and system integrators to discuss with the Technical Committees on the aspects of utility, technology, feature, literature, design, technical parameters, clientele and other related issues of the equipment and material for the following items to be procured for CSIR-IHBT

| Sl. No. | File No. | Item Description |
|---|---|---|
| 01. | 4/5(321)19 - Pur | Bioreactor system |

1. **The address for submission of document and for obtaining further information:**

Controller of Stores & Purchase
CSIR – IHBT, Palampur -176061,
Himachal Pradesh (INDIA)
Tel. 91-01894-230425 / e-mail : spo@ihbt.res.in

2. The Bidding document can be downloaded free of cost directly from Central Public Procurement Portal (CPPP) of Government of India website http://eprocure.gov.in/epublish/app and CSIR-IHBT website www.ihbt.res.in

3. **Schedule for submission:** The prospective bidders should adhere to due dates specified in Tender Details corresponding to this Tender. The Schedule for Submission of proposals and Opening of proposals is as follows, through portal etenders.gov.in

| **Date & Time of Submission of proposals** | | **Date and Time of Opening of proposals** | |
|---|---|---|---|
| Date | Time (IST) | Date | Time (IST) |
| **03rd December 2019** | **11:00 Hrs** | **03rd December 2019** | **14.00 Hrs** |

4. **PRESENTATION BY BIDDERS. Presentation by bidders** is scheduled for 19.11.2019, from 02.30 P.M onwards. Venue is CSIR- IHBT – J.C Bose Conference Hall. **Interested bidders are requested to send email to spo@ihbt.res.in confirming their willingness for making their presentation, on or before 15.11.2019 4.00 p.m.** Bidders will be allotted time slots to make presentations

   **a.** on their products profile in brief
   **b.** detailed specifications and
   **c.** technical capabilities.

5. The bidders' representatives who will make the presentation should possess all the technical details of the machinery, its capacity, complete information on the company, previous experience, various technologies involved, service centres available in India / abroad and financial capabilities to execute project. The representatives should be capable enough to answer all queries of the Technical Sub Committee.

6. The Technical Sub Committee ( TSC ) shall finalize specifications after knowing/obtaining details about relevant/available technology in the market suiting to the requirement and R&D needs of our Laboratory.

7. For evaluating the responses, CSIR-IHBT may call for further presentations of their case in person or Presentation can be considered via Skype/Video Conferencing also.

8. The Director, CSIR- Institute of Himalayan Bioresource Technology ( CSIR – IHBT ) Palampur HP, India reserves the right to accept or reject any or all EOI Notification/tenders/offers or withdraw the Notice at any stage of processing without assigning any reason whatsoever, such an event would not cause obligation of any kind to CSIR- IHBT

- Controller of Stores & Purchase

## 1. INTRODUCTION

CSIR IHBT requires the Bioreactor system for enzyme production from microbial cells.

## 2. OBJECTIVE

The objective of this EOI is to receive complete technical proposals, detailed specifications of various machinery / process involved, study drawings, study plant lay outs, understand various technologies and processes involved, understand bidder capabilities to execute such supplies and then finalize specifications, list of machinery / items etc and also set eligibility criteria for bidders etc.

## 3. SCOPE OF SUPPLY

### A. Pilot Scale Bioreactor (Quantity: 01 Number)

1. Vessel capacity
    a. Minimum working volume 35 lts or lower.
    b. Total working volume 100 lts or higher.
2. Vessel construction
    a. Cylindrical vessel as per ASME certification.
    b. Aspect ratio (H: D) 3:1
    c. Vessel finish internal: electro-polish Ra ≤ 0.4 µm.
    d. Vessel finish external: Ra ≤ 1.25 µm.
    e. Material of construction: SS316L.
3. Vessel design
    a. Operation type: batch, fed batch and continuous.
    b. Design pressure reactor ≥ 3 bar.
    c. Design pressure jacket ≥ 3.40 bar.
    d. Flat top head plate lid.
    e. All utility piping to be made of SS 304/ 316/ 316L.
    f. View glass with illumination port on top plate.
    g. Longitudinal sight glass.
4. Agitation system
    a. Impeller type: Rushton turbine impellers with 6 flat vertical blades configuration.
    b. No. of impeller: 03 nos. (adjustable)
    c. Drive: Bottom/top driven agitator.
    d. Seal: double mechanical seal or magnetic coupler.
    e. Agitation range: 100-500 rpm ± 5 rpm or better.
    f. Sensor: Tachometer/photo-optical encoder.
    g. Baffles: 04 nos. (removable)
5. Aeration system
    a. Separate TMFC (thermal mass flow controller) for air, $O_2$ & $N_2$.
    b. Gas supply capacity
        i. Air: 150 LPM or better
        ii. Oxygen: 60 LPM or better
        iii. Nitrogen: 60 LPM or better
    c. Cylinders for $O_2$ & $N_2$ with separate pressure gauge and regulator should be provided.
    d. Gas inlet line and exhaust gas line to be provided with SIP 0.22 µm air filter (with SS316L filter housing).
    e. Air condenser installed in exhaust gas line to minimize water loss from fermenter.
6. Control platform & software

a. A splash proof microprocessor based/PLC control platform with atleast 12-inch touchscreen interface.
b. Windows based **S**upervisory **C**ontrol **A**nd **D**ata **A**cquisition (SCADA) software for monitoring, record and control of following parameters with security features.
    i. pH
    ii. Temperature
    iii. Dissolved oxygen (cascade control function with any one and any combination of the following parameters stirrer speed, aeration rate, gas mix etc. simultaneously.)
    iv. Agitation speed
    v. Gas flow
    vi. Vessel back pressure
    vii. Foam
    viii. Level
c. The software must be cGMP compliance and compatible with quoted model.
d. It should have facilities for manual override of all values, set points and process parameters during the process.

7. Sterilization
    a. Fully automatic SIP process.
    b. The vessel should be designed for:
        i. Automated empty vessel sterilization
        ii. Automated full vessel sterilization.
8. Temperature control system
    a. Sensor: RTD/Pt 100
    b. Range: at least 10$^{o}$C above cooling water temperature up to 130$^{o}$C or more with an accuracy of ± 0.5$^{o}$C.
9. pH control system
    a. The pH control range: 2-12 pH with an accuracy ± 0.01 units.
    b. Probe: gel filled pH probe with plug and cable.
    c. Probe should be SIP and CIP compatible.
10. Dissolved oxygen system
    a. DO control range: 0-100% with an accuracy ± 1.0%.
    b. Polarographic dissolved oxygen probe with plug and cable.
    c. Probe should be SIP and CIP compatible.
11. Foam and level sensor: Separate foam sensor and level control sensor should be provided.
12. Automatic back pressure control in the range of 1 to 10 PSIG (with an accuracy ± 0.2 PSIG).
13. Feed lines and feeding pumps
    a. 04 nos. of re-sterilizable addition ports with valve sets for acid, base, antifoam, media/inoculum addition.
    b. 05 nos. of peristaltic pumps per vessel with atleast 2 variable speed control pumps. All the pumps must be “assignable” and should be able to deliver against 1 atmospheric pressure.
14. Sampling and harvesting system
    a. Sampling device with a provision for independent sterilization cycle.
    b. A re-sterilizable harvest drain valve at bottom of vessel.
15. Safety
    a. Safety alarm for temperature measurement failure, agitation speed, power off.
    b. Process alarms for high and low temperature, level, pressure, foaming, pH and DO.
    c. Sanitary rupture disk in the vessel.
    d. Safety release valve on the drain jacket.

**B. <u>Seed Bioreactor (Quantity: 01 Number)</u>**

16. A fully automatic seed fermenter to be provided with the below mentioned specifications
    a. Total working volume 10 lts or higher.
    b. Cylindrical vessel as per ASME certification.
    c. Aspect ratio (H: D) 2:1 or 3:1
    d. Vessel finish internal: electro-polish Ra ≤ 0.4 µm.
    e. Material of construction: SS316L.
    f. Fermenter system should be designed to support fully automatic SIP process.
    g. Agitation system: top driven with double mechanical seal/magnetic coupler, 3 nos. of six flat bladed Rushton turbine, 4 nos. of removable SS 316L baffles.
    h. Gas inlet line and exhaust gas line to be provided with SIP 0.22 µm air filter (with SS316L filter housing).
    i. Air condenser installed in exhaust gas line to minimize water loss from fermenter.
    j. SCADA software for monitoring, record and control of various parameters like pH, dissolved oxygen, temperature, automatic back pressure control, agitation speed, gas flow, foam, level.
    k. Aeration system: separate MFC's for air & $O_2$.
    l. 03 nos. of re-sterilizable addition ports with valve sets for acid, base, antifoam, media/inoculum addition.
    m. 3 nos. of assignable peristaltic pumps per vessel with at least 01 variable speed control pumps.
    n. A re-sterilizable sampling valve and harvest drain valve.
    o. Sanitary rupture disk in the vessel and safety release valve on the drain jacket.
    p. Provision of re-sterilizable SS316L seed line to aseptically transfer the seed to large scale fermenter.
17. Both pilot scale and seed fermenter should be of same make and integrated on self-supporting SS304 frame
18. SS304 platform/stair to be provided to reach top plate of bioreactor.
19. Computer with i7 processor, 8GB RAM, 2TB HDD, Windows 10 and 21 inch LED Monitor. Laser-jet printer and computer platform must be provided.
20. Documentation: Should Provide IQ/OQ documents and performance at site as per cGMP standard.
21. Mechanical documentation, flow charts and valve matrix, P&I diagram, general arrangement drawing and layout drawing for both pilot scale and seed fermentor to be supplied.
22. Operation and maintenance manual for both pilot scale and seed fermentor to be supplied.
23. Spare parts (one set each for pH and DO sensor with cable, DO membrane kit with electrolyte, air filters for air inlet and air exhaust, all O rings, septums, gasket, diaphragms, sampling set & bottle, addition bottles complete with filters, connectors and tubing's compatible with acid, base, antifoam, inoculum and substrate), preventive maintenance kit and tool box for pilot scale bioreactor.
24. Spare parts (one set each for pH and DO sensor with cable, DO membrane kit with electrolyte, air filters for air inlet and air exhaust, all O rings, septums, gasket, diaphragms, sampling set & bottle, addition bottles complete with filters, connectors and tubing's compatible with acid, base, antifoam, inoculum and substrate), preventive maintenance kit and tool box for seed bioreactor.
25. Application support and services to be offered with free upgradation of software for atleast 5 years.
26. Warranty: 2 years from the date of installation.
27. AMC for 3 years after expiry of warranty must be quoted.

28. Utility: Steam generator with below mentioned specifications
    a. Electrical driven with steam generation capacity ≥ 70 kg/hr.
    b. Steam heater capacity ≥ 45 KW.
    c. Steam outlet pressure ≥ 3 bar.
    d. Low water level sensor for auto-cut off in case the water level falls below the prescribed level.
    e. Auto refill feature to ensures automatic refilling from a facility-supplied water source to ensure the proper fluid level is maintained.
    f. Safety pressure relief valve to protect the equipment in case of over pressurisation.

29. Compliance certificate: A compliance table in addition to marking in technical brochure (quoted models) as per the specifications point by point must be submitted by the vendor.

30. Technical brochure and literature of the quoted models to be submitted if available.

## 4. Eligibility Criteria

### Technical

1. Original Equipment Manufacturers (OEMs) / Authorized Agent who have proven expertise in successful supply of Bioreactor system. **The bidder should have successfully supplied and installed at least one Bioreactor system of similar specifications, in the last 2 years as on the date of bid submission. Documentary evidence to this effect shall be attached to the EOI / Proposal.**

### Commercial

1. The bidder should not have been black listed / holiday listed by any other CSIR laboratory, or by any other R&D organization or by Government of India. A self declaration letter in this regard must be enclosed.

2. Proposals

**1. Technical**

a) Detailed specifications of various machinery / instruments involved supported by technical brochures / data sheets in English. The Bidder shall provide the complete technical information (without any IP related material) with specific OEM name, Model Number etc.

b) Write up / detailed brochure / datasheets on the technologies / techniques involved.

c) Electrical requirements – voltage, frequency, single phase / three phases, total power consumption in kwh.

d) Requirement of special foundation / flooring for each machine. If required, then clear details.

e) Plant lay out drawing in English. Dimensions must be in Metric (mm / cm / Metres).

f) Other utilities required

g) Air conditioning, UPS requirements if any.

h) Stabilized power supply requirements (like servo stabilizer etc.).

i) Backup power supply like diesel generator requirements

j) Total space for plant requirements

**2. Bidder Information**

a) Company information – Status of bidder, registration certificate, and detailed write

up about bidder history.

b) Details of Personnel – Details of all key technical, commercial and service personnel.

c) Details of Production capacity, location of factory involved in production of machinery etc.

d) Details of financial information about company in the last 3 years, like turnover, copies of audited balance sheet etc.

e) Copy of solvency certificate from banker.

f) Details of service setup in India.

g) Self certified letter about holiday listing / black listing in bidder letter head.

h) If dealer / authorized channel partner / distributor etc. Manufacturer authorization letter.

i) Copies of Purchase orders / contracts of similar supply made in the last 2 years and the performance certificate from the respective clients.

j) The Bidder shall indicate the timelines necessary for supply / installation / commissioning of the items under Scope of Work.

**Similar Work Experience Details:**

| Sl. No. | Name of the work with location | Date & Ref. no of completion certificate (If available) | Date of start Cost of work | Reference document (Work Order/ Work Completion Certificate) to be attached, mention page no |
|---|---|---|---|---|
| | | | | |

3. Commercial: The Bidder may submit a Budgetary Estimate for all the items under the Scope of supply. The Budgetary Estimates shall be held confidential and will not be disclosed to other Bidders after the EOI responses are opened.

## 5. Other Terms

**Purchase of EOI Document**

The Expression of Interest document shall be downloaded from Central Public Procurement Portal (CPPP) of Government of India website http://eprocure.gov.in/epublish/app and CSIR-IHBT Website www.ihbt.res.in free of cost.

**Clarifications on the EOI Document**

Any clarification in the EOI document may be sent in writing to the following through email:

Controller of Stores &Purchase
e-mail spo@ihbt.res.in

However, no extension of the time or date of EOI submitted will be provided on the ground that CSIR-IHBT has not responded to any query/clarification raised by any Bidder.

**Amendment of Terms and Conditions of EOI**

CSIR-IHBT may at its discretion or as a result of a query, suggestion or comment of an Bidder, may modify the EOI document by issuing an amendment or a corrigendum at any time before opening the EOI. Any such Addendum or Corrigendum will be uploaded on CPPP Portal http://eprocure.gov.in/epublish/app and CSIR-IHBT's website and the same will be binding on all the Bidders, as the case may be.

CSIR-IHBT at its discretion may extend the due date of submission of EOI and the decision of CSIR-IHBT in this respect would be final and binding on the respondents. In the event of changes in the time schedule, CSIR-IHBT shall notify the same only through its CSIR-IHBT website www.IHBT.res.in. Interested Bidders are advised to check the above website regularly for corrigendum / addendum, if any, which will be published only in the web site.

No oral modification or interpretation of any provisions of this EOI shall be valid. Written communication shall be issued by CSIR-IHBT when changes, clarifications or amendments to the EOI document are deemed necessary by CSIR-IHBT at its sole discretion.

EOI submission should be in English language. EOI response should be free from correction, over writing, erasures etc. Duly authorized representative of the Applicant shall sign on each page of the EOI documents. EOI documents should be prepared in such a way so as to provide a straight forward, concise description of Applicant and capabilities to satisfy the requirements of this EOI.

If at any time during the examination, evaluation and comparison of EOI, CSIR- IHBT at its discretion can ask the Bidder for the clarification of its EOI. The request for clarification and the response shall be in writing. However, no post submission of EOI, clarification at the initiative of the Bidder shall be entertained.

Canvassing by respondents in any form, including unsolicited letters on EOI submitted or post corrections shall render their EOI response liable for summarily rejection.

The cost or charges incurred in preparation and submission of EOI response shall not be entitled by any respondent.

Conditional offers will be summarily rejected. EOI which is found to be incomplete in content and / or attachments and / or authentication etc. is liable to be rejected.

No Agent/Agents or third party/parties are engaged by CSIR-IHBT in this process.

CSIR-IHBT is not responsible for any firm/agency expression or representing to express himself/herself/themselves to be the agent or third party representing CSIR-IHBT in this process.

It is advised to deal directly with CSIR-IHBT representative who is the signatory to this document. Disregard of any instruction may result in offer being ignored.

EOI that are incomplete in any respect or those that nor consistent with the requirements as specified in this document may be considered non-responsive and may be liable for

rejection and no further correspondence will be entertained with such Bidders.

All cost and expenses associated with submission of EOI shall be borne by the Bidder while submitting the EOI. CSIR-IHBT shall have no liability, in any manner in this regard, or if it decides to terminate the process of short listing for any reason whatsoever.

**NON-COMMITTAL EOI.**

After short listing of bidders at this EOI stage, the second stage bidding may not be restricted to short listed bidders only and CSIR – IHBT may resort to Open / Global Tendering for further participation by potential bidders. This may please be noted by all concerned.

(S.GNANAPRAKASAM)
- **Controller of Stores & Purchase**