KUSUMA SCHOOL OF BIOLOGICAL SCIENCES
Indian Institute of Technology Delhi
Hauz Khas, New Delhi - 110016

Date: August 26, 2013

NOTICE INVITING QUOTATIONS

PURCHASE OF CELL ELECTROPHYSIOLOGY SYSTEM

Sealed quotations are invited for the purchase of a *Cell Electrophysiology System* according to the specification given below. The *Technical Bid and Financial Bid* **must be sealed in separate envelopes**, placed inside an **outer cover envelope, and sealed**. Your quotation should be **superscribed "Quotation for Cell Electrophysiology System A (or System B or System A&B)"**. Your sealed quotation must reach the address below latest by 5 PM on 30th September 2013.

Prof. James Gomes
Kusuma School of Biological Sciences
Indian Institute of Technology Delhi
Hauz Khas, New Delhi - 110016, India

SPECIFICATIONS

The Complete Cell Electrophysiology Systems consists of **two units** named **System A** and **System B.** A company is free to quote for **either** *System A* **or** *System B* **or both** *System A and System B.*

SYSTEM - A

System A is a microelectrode array system to carry out electrophysiological work in individual cells or tisue slices. The system consists of the following units: microelectrode arrays, a data acquisition system for recording signals and stimulating cells, a video microscope for visualization, a vibration isolation table, software for data analysis, and accessories needed to ensure perfect installation. User Manuals must be included. Optional components including recommended accessories and a Faraday cage and should be quoted separately but within the scope of "System A".

1. Microelectrode Arrays

i. 5-10 Nos of Microelectrode Arrays with different configurations of electrodes
ii. Microelectrodes should be autoclavable and last for at least 50 reuse cycles
iii. The electrode material should be Titanium nitride, gold or equivalent
iv. The microelectrode must have a built-in temperature control
v. The microelectrode array must be suitable designed to work with upright and inverted microscopes

2. Data acquisition, recording and stimulation

i. The data acquisition system must be designed specially to measure low current (~pA) and across high impedance (~GΩ) from cells growing /attached on to the microelectrode array.

ii. The system must have an integrated stimulus generator giving an output current in the range of ±1.5 mA with a compliance voltage of ±10 V. Similarly, the output voltage must be in the range of ± 12 V with a compliance current of ±20 mA. The system must permit various stimulation patterns such as rectanglular biphasic, monophasic, pulse trains
iii. It must have a provision for real-time signal detection and feedback
iv. The desirable sampling rate of signals from the cell/tissue is up to 50kHz per channel/ about 20.5 MByte/sec data transfer rate with real-time audio output
v. The Input/Output available for triggering/synchronization must have a 16 bit Digital resolution
vi. A suitable PC with hardware and software for on-line / real-time signal processing, gain and bandwidth adjustment and integrated stimulation of selected electrode must be provided
vii. The system must be compact with small footprint

3. Video microscope system

i. The video microscope must be suitable for capturing images of the electrode array
ii. The camera for imaging must have a CMOS sensor for capturing images at 15 frames/sec with a resolution of 2560 × 1920, 5 M Pixel. It must have a macro zoom lens with a desirable magnification of 0.3~1.0X and aperture ratio 1 : 4.5
iii. The system must be equipped with a flexible LED light for illumination of the sample with manual option for Control of iris, focus, and zoom
iv. The microscope system must enable image transfer via USB 2.0 to a computer

4. Vibration Isolation Table

i. The desired dimensions of the table is 750 mm (width)×1200 mm (length)×100 mm (height) approximately, with adjustable height
ii. It should be made from corrosion resistant steel
iii. It must have anti vibration Gimbal Piston Isolators.
iv. Vibration testing must comply with vertical resonance frequencies: ~1 μm 1.0 Hz; 0.1 μm 1.5 Hz, and horizontal resonance frequencies:~1 μm 1.2 Hz; 0.1 μm 1.7 Hz and the desired efficiency of isolation should be @ 5 Hz vertical 95 % & horizontal 80 %; @ 10 Hz vertical 99 % & horizontal 95 %

5. Software

i. The software must possess necessary features to facilitate recording data from cells growing on the microelectrode array, selection of electrode for recording, stimulation, and analysis.
ii. The software must support data format used by most commercially available programs (e.g. Neuroexplorer) and include free tool for data conversion
iii. It must be able to interface with Matlab
iv. The cost of the software should be inclusive with preferably perpetual license. There should be no restriction on upgrades. License must be granted for several computers at no additional cost.

6. Optional (To be quoted separately for System A)

A. Faraday Cage with dimensions approximately 750 mm x 1200 mm including rails as required

SYSTEM - B

System B consists of motorized micromanipulators and an upright microscope for visualization and probing cells *in-vitro* using femto-tip electrodes, microinjection etc. The micromanipulators must be stable and capable of smooth and precise movement and having stepper motors of high quality. The construction should be modular to enable easy switch over from one configuration to another. The upright microscope must be modular and easily upgradeable. It should have an IR-DIC and IR oblique illumination condenser for deep cell observation. Microscope operation should have reduced vibration for electrophysiology work. The stage should be motorized with X-Y travel range of 200 mm×100 mm, and fine movement of 25 mm with a resolution of 20 nm. It should come with a camera for time-lapse imaging and recording. The system must be supplied complete with all standard accessories and components necessary for the complete installation of the system and user manuals must be included.

1. Micromanipulators and Stimulator System

The Micromanipulator System will consist of the following components and accessories for executing electrophysiology work.

i. 2 Nos. Motorised with a 3 axis smooth micromanipulator having about 20 mm travel range, and a resolution of 20 nm or better in XYZ and fourth virtual approach axis. The drift must be less than 1 micron over a period of 2 hours. The design should permit low (shallow) angle positioning of headstages or probes.
ii. 2 Nos control units for controlling micromanipulator. The device must have weighted wheels connected to rotary optical encoders for easy control of micromanipulator movement.
iii. A Motorized Top Plate with mounting carriages, recording chamber, magnetic mounting ring and perfusion tools must be included (or with microscope or as required)
iv. User interface for motorized remote positioning and tracking software must be included with homing, recall and memory position features.

2. Microscope for Electrophysiology

i. Microscope

Upright microscope must be specially designed and suitable for electrophysiology work with low vibration body and infrared illumination.

a) The microscope must have bright field and infrared illumination with DIC attachment for 10X and 40X objectives
b) The condenser should have long working distance with a slot for DIC prisms for the above objectives and should be equipped with IR polarizer, Analyzer, IR filters and DIC prisms for all objectives.
c) Lamp house for infrared light application, connecting cable for halogen lamphouse, Power supply 230V, Transformer for 100 W Halogen lamp, 220-240 V.

ii. Objectives & eyepiece

a) The objectives must have long working distance, Fluorite coated, no-cover water immersion type - 10X /0.3, W.D. 3.3mm and 40X/0.8, W.D. 3.3 mm
b) Objective must have high transmissions over the entire wavelength range from UV to Infrared
c) The eye piece should be 10X having adjustable diopters with FOV 22 or more

iii. Camera

a) The camera should be CCD real-time camera (30 frames/sec full resolution). It should have sensitivity across the entire visible and near IR spectrum. It should have a 8-12 bit digital output with readout frequency of about 24 Mhz. It must have

1280×1024 light sensitive pixels or higher, with a USB 2.0 interface An optional computer interface board should be provided for applications such as electrophysiology, infrared differential interference contrast (IR-DIC)

iv. Fluorescence attachment

a) The fluorescence attachment should consist of a turret for 6 fluorescence cubes with high transmission narrow bandpass excitation, centerable aperture with UV protective shield
b) It should have a 120 watt (2000 hour life) metal halide discharge lamp and built in attenuator for adjustable light intensity
c) The system should have a band blue excitation, exciter filter and a dichroic beam splitter
d) It must have Epi fluorescence unit with filters for DAPI, FITC, and TRITC
e) It should have 2/3" monochrome cooled CCD camera with I.4 Megapixel resolution and Pixel Size of 6.45X6.45 and 12 or 14 bit Digitization for fluorescence imaging

4. Optional (To be quoted separately for System B)

i. **Objective Lens**

Long Working Distance with high NA Objective Plan 25X, NA 1.05, water dipping type with collar correction suitable for IR deep imaging and electrophysiology applications.

ii. **Dual Port with Magnification changer** (to be used in place of Dual port adapter)

For mounting two separate cameras and for simultaneous IRC DIC and Fluorescence observation with suitable dichroic mirror and inbuilt magnification changer

iii. **Motorized stage for microscope**

Motorized translational stage for high-resolution X-Y movement of microscope. The manipulators and sample are fixed while the microscope moves, allowing different fields of view.

TERMS AND CONDITIONS

1. Please submit the TECHNICAL and FINANCIAL bids in separate sealed envelopes. Mark the two envelopes clearly as "Technical Bid" and "Financial Bid". Both the sealed envelopes should be sent inside a single sealed envelope, clearly marked as mentioned on Page 1 and the quote should reach the following address on or before the date and time mentioned on Page 1.

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2. The company must be the principal or the authorized dealer with valid certification.
3. A company is free to quote for **either** *System A* **or** *System B* **or both** *System A and System B.*
4. Please quote prices at FOB New Delhi, inclusive of installation charges. CIP charges should also be quoted separately.
5. IIT Delhi is exempted from paying custom duty under notification No.51/96 (partially or fully) and necessary "Custom Duty Exemption Certificate" can be issued after providing following information.
   a. Shipping details i.e. Master Airway Bill No. and House Airway No. (if exists)
   b. Forwarder details i.e. Name, Contact No., etc.
   Custom Duty Exemption Certificate will be issued to the shipment in the name of the Institute and Bills of Entry should be submitted to IIT Delhi later on.
6. Either the Indian agent on behalf of the Principal/OEM or Principal/OEM itself can bid but both cannot bid simultaneously for the same item/product in the same tender. If an agent submits bid on behalf of the Principal/OEM, the same agent shall not submit a bid on behalf of another Principal/OEM in the same tender for the same item/product.
7. If the bidder is an authorized dealer of any manufacturer, the authorized Indian dealership certificate from the principles should be enclosed. Similarly, proprietary certificate for proprietary items should be provided from the principals stating,
   "Certified that _____ is a proprietary item of M/S _____ and no other manufacturer makes these items"
8. IIT Delhi is exempted from paying Excise Duty and necessary Excise Duty Exemption Certificate will be provided for which following information is required.
   a. Quotation with details of Basic Price, Rate & Amount on which ED is applicable.
9. **Three years** comprehensive warranty be provided and **AMC price for 2 more years** should be mentioned separately
10. Payment Options - Letter of Credit: 90% payment against shipping documents & balance 10% after satisfactory installation.
11. Delivery period: within 1 month from the issue of supply order
12. The quotations must have validity of at least three months.
13. The products will be used for educational purposes. Any applicable academic institution discounts should be offered and stated clearly.
14. **Authority of IIT Delhi reserves the right to reject any or all quotations without assigning any reasons.**