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**Annamalai University**  
**DEPARTMENT OF BIOCHEMISTRY & BIOTECHNOLOGY**  
DST-FIST & UGC-SAP Assisted  
**Faculty of Science**  
Annamalainagar-608 002, Tamil Nadu



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From  
Dr. N. Nalini  
Professor and Head  
Department of Biochemistry & Biotechnology  
Annamalai University

To  
The Registrar  
Annamalai University

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26.09.2019

Through

The Dean  
Faculty of Science

Sir,

Sub: Request to upload specifications for Biospectrometer fluorescence -Reg.  
Ref: 1. DST letter No. SR / FST / LS-II / 2017 / 90(C) dt. 28<sup>th</sup> Dec, 2018.  
2. AU Project code No. 335-C-27.

The DST-FIST, New Delhi has sanctioned Rs. 9.5 Lacs for the purchase of Biospectrometer fluorescence under DST-FIST programme.

M/s Eppendorf Agency, Germany has given a proprietary certificate for that instrument. I request you to kindly upload the documents (Proprietary certificate and the specifications) in our website for open information, to submit objections, comments, if any, from any manufacturer regarding proprietary nature of the equipment within 10 days.

Thanking you,

yours sincerely,

(N. NALINI)

**Encl:** CD containing proprietary certificate and Specifications

**Copy to:** The Director  
Innovation Centre  
Annamalai University

PROFESSOR AND HEAD  
Department of Biochemistry  
and Biotechnology  
Annamalai University  
Annamalai Nagar - 608002,  
Tamilnadu.

The Registrar  
Annamalai University  
Annamalai Nagar  
608 002 Chidambaram  
Tamil Nadu  
India

Hamburg, 11. March 2019

### Proprietary Certificate

Dear Sir / Madam,

We, Eppendorf AG, Hamburg, Germany, who are a proven and reputable manufacturer of Laboratory Equipment, having factories in Germany, the United Kingdom and the United States of America, do confirm that the Eppendorf BioSpectrometer® fluorescence has following proprietary features:

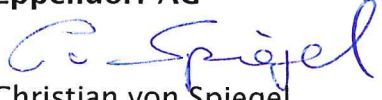
- Cuvette based stand-alone instrument combines both fluorescence and absorbance spectrophotometer.
- Confocal filter fluorometer and Absorption single-beam photometer with reference beam as measuring principle.
- Combination of Xenon flash lamp as light source, Holographic aberration-corrected concave grating monochromator with CMOS photodiode array beam receiver.
- Combination of LED as light source with photodiode as fluorometer beam receiver.
- Integrated data processing using Eppendorf SpectraZoom® method.

The Eppendorf µCuvette® G1.0 has following proprietary features:

- Microvolume measuring cell for measuring 1.5 – 10 µL sample volumes.
- Hydrophobic surface coating on quartz glass for precise formation and positioning of the sample volume.

For the avoidance of doubt, the liability under this declaration is limited to the product itself. To the best of our knowledge, there is no instrument available in the market with identical specifications.

Yours faithfully,  
**Eppendorf AG**



Christian von Spiegel  
Head of Legal and Compliance



Dr. Andrés Jarrin  
Head of Market Support Management APA



Sales  
Barkhausenweg 1  
22339 Hamburg  
Germany

## **Cuvette-based stand-alone Spectrometer to perform both fluorescence and UV/Vis spectrometric applications (BioSpectrometer® fluorescence – 230V/50 – 60 Hz, part No. 6137 000.006)**

Single compact instrument for both fluorescence spectrometer and UV/Vis spectrometer allowing quantification of sample volumes from 'microlitres to millilitres', with at least 100 installations of BioSpectrometers.

### Fluorescence spectrometer mode (Specifications):

- System should be capable of determining very low concentration of biomolecule using fluorescent dyes, with an excitation wavelength of 470 nm and emission wavelengths of 520 and 560 nm
- Must allow to choose up to 12 standards for standard curve calibration with curve fit analysis viz., regressions (linear, cubic & quadratic) and interpolations (linear & spline)
- Number of sample data display graphically should not be restricted
- Should allow using conventional visible cuvette with volume range starting from 50  $\mu\text{L}$  and NOT special or specific tubes
- Should have in-built pre-programs for nucleic acids and protein quantification by fluorescence intensity using dyes such as PicoGreen®, OliGreen®, RiboGreen® and NanoOrange®.
- Fluorescence intensity should be across a range of 0.5 nM - 2,000 nM fluorescein
- Should be compatible with microliter measuring cells and standard cuvettes
- Detection limit for dsDNA should be 1  $\text{pg}/\mu\text{L}$
- Measuring principle should be confocal filter fluorimeter with reference beam
- Should have the combination of LED as light source along photodiodes as beam receiver
- Should have excitation wavelength 470 nm with 25 nm bandwidth
- Should have emission wavelengths 520 nm with 15 nm bandwidth and 560 nm with 40 nm bandwidth
- Random error should not exceed  $\pm 2\%$  at 1 nM fluorescein (emission wavelength 520 nm)

### UV/Vis Spectrometer mode (Specifications):

- System have preprogrammed methods for rapid and reliable analysis of Nucleic acids and proteins, OD600, dye methods (parallel measurement of biomolecule and dye label), FOI (frequency of incorporation) calculation.
- Should allow measuring and recording of UV/Vis spectral wavelengths from 200 to 830 nm, with smallest increment: of 1 nm
- Should allow extinction measurement for one or several wavelengths
- Should allow using sample volume  $\geq 2 \mu\text{L}$ .
- Must be supplied with 200 numbers of plastic cuvettes to handle minimum of 50  $\mu\text{L}$ .
- Recording of wavelength scans should be possible with Integrated data processing
- Should have in-built methods with analysis via factor, standard or standard series
- Should allow performing Dual-wavelength method with subtraction and division analysis
- Should have data evaluation methods for concentration via standard series (Regression: linear, cubical, Quadratic) and (Interpolations: linear and Spline)
- Should have freely selectable wavelengths providing maximum flexibility for all current and future applications

- Should have SpectraZoom<sup>®</sup> technology to analyze and process curve sections in detail view directly on the instrument display and for peak detection
- Should have the combination of Absorption single-beam spectrophotometer with reference beam as measuring principle with Xenon flash lamp as light source and beam receiver as CMOS photodiode array
- Spectral band width should be < 4 nm
- Photometric measuring range should be 0 A to 3.0 A at 260 nm
- Random error should be  $\leq 0.002$  if  $A = 0$ ,  $\leq 0.005$  (0.5 %) if  $A = 1$
- Systematic error should be  $\pm 1\%$  if  $A = 1$

Additional System features:

- System should be small, lightweight, mobile and should be easy to operate with its integrated 5.7 inch color display in combination with the keys of the device
- Data transfer of measured data to a PC by connecting the device directly to a PC should be possible without any additional software or should be through USB stick
- Should have guided software sequence to minimize errors
- Should allow direct operation on the device and must not require PC to operate
- Should have facility for saving > 1,000 measured results in the instrument directly
- Should allow user to program and save > 100 new methods
- Light beam height should be 8.5 mm
- Cuvette shaft should have dimension of 12.5 mm x 12.5 mm, allow using Quartz/ UV transparent plastic cuvettes (UV range); Glass / plastic cuvettes (visible range) and micro-volume cuvettes
- Display should be VGA TFT-5.7"
- Power consumption should be as low as 15 W during operating step
- Power supply: 100 – 240 V, 50 – 60 Hz
- Should weigh 5.4 kg
- Dimensions (W x D x H) in mm: 295 x 400 x 150
- One-year warranty