Confocal Laser Scanning Microscope (CLSM)

Model Name: Leica TCS-SP8

Specifications

- AOTF controlled Five laser lines 488, 514, & 633nm
- Five fully adjustable PMT detectors (i.e. can be set to capture any given range of emission from 400 to 800 nm),
- Transmitted light detector with DIC option
- Two filter cube based avalanche photo diode (single photon sensitivity) detectors which can be used with green and far-red fluorophores for imaging or FCS
- 10x, 20x, 40x, & 100x (oil immersion) objective lenses
- Resonant scanner (8kHz) for very high speed image acquisition
- Uses Leica Specific Software (LASX)

Applications:

Confocal Laser Scanning Microscopy (**CLSM**) is an optical microscopic technique for obtaining the 2-D and 3-D high-resolution optical images, projections as well as 3-D reconstructions of auto fluorescent objects excited with aid of laser-induced light operating at variable visible wavelength. The key feature of confocal microscopy is its ability to acquire in-focus images from selected depths, a process known as optical sectioning. Images are acquired point-by-point and reconstructed with a computer, allowing three-dimensional reconstructions of topologically complex objects. CLSM can be utilised to study microfossil, organic walled spores, pollen, fungi and fossil protists as well as helpful in determining the structure and composition of the fossilised cell wall of higher plants.

Capability:

- High resolution blur-free confocal imaging in fluorescence and reflected light modes;
- Individual continuous cellular tomograms without slicing cells and stereographs which are observed by three dimensional reconstructions;
- High depth of focus extended focus images approaching SEM quality without special object preparation;
- Easy visualization of 3D structures by stereo pairs, red/green anaglyphs, 3D reconstructions, animation;
- Concurrent analysis of surface structures and internal structures (e.g. cavitation, wall structures);
- Multi-channel fluorescence imaging, including blue fluorescence (excitation 405 nm) through far red fluorescence (excitation 633 nm);
- Co-localization analysis;
- Live cell imaging and quantitative analysis over time.
- Spectral imaging;
- Topography analysis, surface roughness data, and Z height profiling;
- Stereology acquisition and analysis;
- Transmitted imaging (bright-field, phase contrast, polarized light, DIC).

Type of Material:

Both, microfossils bearing petrographic thin sections (thickness up to 150 – 200 Micron) and palynological slides and live biological specimens prepared through standard protocols can be studied on the microscope.

Dos or don't for CLSM Laboratory:

- Only authorised/registered users are allowed to access the CLSM laboratory;
- Non authorized users are not allowed to remove objectives of the microscope or attempt any maintenance;
- Users are not permitted to setup, alter and save new configurations of lasers and filters. The pre-programmed configurations are suitable to cover most of the applications in the Institute.
- There is only one on/off switch for the entire system. Do not touch any other on/off switch on the microscope, computer or power supplies.
- When completed your studies and imaging work please switch off the lasers and wait until they are properly shut down before exiting the LMS software;
- Copy your images to CD, and DVD or network drive before you leave. There is no scope of long time storage of images left on the microscope operating system and may be deleted at any time without warning.
- Please bring England Finder Co-ordinates of your specimens to save time.
- Data generated will be provided on CD (Compact Disc) or DVD (Digital Versatile Disc).
- Petrographic thin section slides are to be mounted with XXXX epoxy.
- Keep thickness of the mounted rock slice between 100-200 μm.
- Analysis of palynological material shall be conducted on Permanent slides. Analysis of samples is restricted to generation of spectra in case 3D imaging in case of CLSM.
- Interpretation of spectra and imaging is available in certain cases and it will be chargeable extra.

BIRBAL SAHNI INSTITUTE OF PALAEOSCIENCES

(An Autonomous Institute under the Department of Science and Technology, Govt. of India)
53, University Road, Lucknow- 226007, India

REQUISITION FORM FOR USING CONFOCAL LASER SCANNING MICROSCOPY UNIT

User Information

1. Name :
2. Designation :
3. Affiliation :
4. Address for communication :
5. Phone number :
6. Email address :
7. Special Instruction(s) :

Certification and undertaking by financially responsible person (HOD / Principal / Guide / Director)**:**
I agree to pay the charges for this analysis and certified that the user is a student / employee of our organization. I assure you that, all publications arising out of research work, where in the analytical services of the BSIP, Lucknow have been made use of, the Center shall be duly acknowledged.

DATE:

Signature with date & seal
(HOD / Principal / Guide / Managing Director)

Sample Information for Analysis:

1. Title of Project: _____
   _____
2. Nature of the Project : Inhouse [ ] Sponsored [ ]
3. Number of samples: _____ Nature of Sample _____ Magnification: _____
4. Analysis charge in (Rs). (DD. No with date & Bank) ----------

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(To be filled by the Center Incharge)

Date of receipt of Sample : _____
Scheduled date of sample analysis : _____
Faculty in-charge for sample analysis: _____

Signature of Indenter

Signature of Lab In-charge

Note:

The charges for external users have to be paid at the time of sample submission. All payments should be made in the form of a demand draft (**D.D**) in favour of **"Director, Birbal Sahni Institute of Palaeosciences"** payable at Lucknow. **Reports will be released only after payment is received.** Kindly send us the publication reference of all publication arising out of analysis done at the Center. (Journal name, Volume number, Names of the authors, Date of issue of the publication etc).

BIRBAL SAHNI INSTITUTE OF PALAEOSCIENCES, LUCKNOW

BSIP/SA/2021-22/Consultancy/L-739

October 11, 2021

NOTIFICATION

The Competent Authority has approved to revise the charges of sample processing of ***Laser Raman Spectroscopy*** and ***Confocal Laser Scanning Microscopy*** including 18% GST as contained in **Schedule 'J'** under **Bye-laws 31.1** as given below with immediate effect till further orders:

REVISED ANALYSIS CHARGES FOR LASER RAMAN SPECTROSCOPY

	Revised Charges		
Nature of Sample	**In house users (Sponsored Project/Inspire /CSIR Fellow)**	**External students, Academic Research Institutions/ Organizations (CSIR Labs, IITs,) and Govt. Universities**	**Private industries, Research Institutions and Universities and Profit-making laboratories**
Raman Spectra	Rs. 1000 (for 04 spectra per sample) + 18% GST Rs. 1300 per subsequent specimen	Rs. 3000 (for 04 spectra per sample) + 18% GST Rs. 500 per subsequent spectra in same sample	Rs. 8,000 (for 04 spectra per sample) + 18% GST Rs. 800 per subsequent spectra in same sample
Raman spectra with imaging	Rs. 2000 (for 04 spectra) + 18% GST	Rs. 5000 (for 04 spectra per sample) + 18% GST Rs. 500 per subsequent spectra in same sample	Rs. 10,000 (for 04 spectra per sample) + 18% GST Rs. 500 per subsequent spectra in same sample
Raman spectra with Confocal microscopy	Rs. 2500 (for 04 spectra) + 18% GST	Rs. 8000 (for 04 spectra per sample) + 18% GST Rs. 500 per subsequent spectra in same sample	Rs. 15,000 (for 04 spectra per sample) + 18% GST Rs. 500 per subsequent spectra in same sample

REVISED ANALYSIS CHARGES FOR CONFOCAL LASER SCANNING MICROSCOPY

	Revised Charges		
Nature of Sample	**In house users (Sponsored Project/Inspire /CSIR Fellow)**	**External students, Academic Research Institutions/ Organizations (CSIR Labs, IITs,) and Govt. Universities**	**Private industries, Research Institutions and Universities and Profit making laboratories**
Petrographic Thin section Palynological slides (fossil)	Rs. 1000 (for 04 specimens) + 18% GST Rs. 300 per subsequent specimen	Rs. 5000 (up to 04 specimen) + 18% GST Rs. 1300 per subsequent specimen	Rs. 8,000 (up to 04 specimen) + 18% GST Rs. 2200 per subsequent specimen
Palynological slides (living material)		Rs. 6000 (up to 04 specimen) + 18% GST Rs. 1800 per subsequent specimen	Rs. 10,000 (up to 04 specimen) + 18% GST Rs. 2800 per subsequent specimen

11/10/2021

(Sandeep K. Shivhare)
Registrar

Copy to:

1. Persons concerned/संबंधित व्यक्तिगण
2. परियोजना समन्वयक/Project co-ordinator)
3. Prof. Mukund Sharma, Scientist 'G', BSIP, Lucknow
4. Dr. Veeru Kant Singh, Scientist 'E', BSIP, Lucknow
5. अनुसंधान विकास एवं समन्वय प्रकोष्ठ(RDCC)/निजी सचिव(PS)/ रजिस्ट्रार कार्यालय(Registrar Office)
6. Convener, Website Committee to upload in everyone@res.in
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