Carl Zeiss Optical Fluorescence Microscope 'Imager.Z1' with APOTOME

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Authorized Users:
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5) Reshma Bharadwaj
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7) Yashwanth Narayan

Materials allowed on the Microscope

1) No restriction on samples unless they are non-standard biological samples requiring level 3 or greater isolation rooms.
2) For biological samples, prior approval from respective supervisor is required.
3) No oil immersion or contact mode microscopy can be carried out because the lenses aren't meant for that. All analysis must be done using a non contact mode; i.e. the lens and the sample must not come in contact with each other.
4) It is better for the candidate to know the excitation frequency for the sample but it is not a mandate.

Training and Authorization Procedure
The training procedure includes
1) The understanding of the general components of the Microscope; i.e. the fluorescence source, the different filters, the magnification tool and other basics. If required, apotome hardware details are discussed
2) An understanding of the data capturing software is also given. Data storage and transfer is permitted using a CD/DVD. No USB drives allowed.
3) Hands on experience using the trainee's sample is carried out a couple of times.
4) 'Safe switching on' and 'switching off' of microscope is shown repeatedly.
5) Once the trainee is confident, he or she performs at least 2 imaging exercises which, if satisfactory, results in system authorization.

Standard Operating Protocol
The standard rule for the microscope's use is to complete one's work and

leave the microscope back to its initial state; made ready for the next operator's use.

1) When the Microscope is off, all the electrical switches must also be off. The eyepiece cover, the plastic encapsulation must be in the right place and the APOTOME module must be placed in its slot which is on the right side of the microscope. The lever that helps switch from the camera to the eyepiece must at all times in a switched off mode be directed to the eyepiece.

2) When using the microscope for normal fluorescence microscopy, the mains must be switched on first. The computer must not be switched on along with the microscope. First, the microscope's power module must be switched on, then the microscope and then the Fluorescence power source (Xcite). Fluoroarc is another module that sits just below the Microscope's power source. This is the secondary Fluorescence source. As long as the 'Xcite' source is functional, 'Fluoroarc' must always be kept off.

3) Before turning ON the microscope, always check the log book for last user entry. If the fluorescence lamp was used in the past hour, allow it to cool. Also, report any abnormalities in the log book to the system owner.

4) Before placing the sample on to the microscope table and before switching the system off, please ensure that the magnification has not been set to max or minimum; i.e. 100X or 1X.

5) While switching off, the system must be left as found by the user before switching it on.

<u>Violation Policy</u>

The violation policy is classified into class 1 and class 2 violations

1) Class 1 violation

If the last user for instance forgets to write proper details of his/her run in the log book

If after use, the eye-piece cover or the microscope encapsulation has not been put on properly

If the table-top has not been cleaned properly after the experiment.

If the violations as mentioned above are not severe in nature, the violation might be excused stating a warning.

2) Class 2 violation

If the user does not operate the hardware or the software properly and is visible in the form of remnants after the experiment or not saving data appropriately thus putting other users' data at risk

If the fluorescence lamp is left on. These components even though long lived with an average life of around 2000 hours, are very crucial to the

operation of other experiments as well. Leaving it on results in unnecessary heating of the lamp not allowing the next user to use it.

If the user does not take care of the lenses and does not report a mishap. This negligence might result in others loosing precious working hours.

Class 2 violations are of a more severe nature than of Class 1 as they put the system at absolute risk and shows direct negligence towards other users.

Reauthorization of tool

If an operator has not used the system for 1 year, his/her authorization will be canceled. Since the tool is general microscopy, not involving any major safety hazards, a reauthorization will be given on the basis of one test run.

Manual

An electronic copy of the maul as provided by the manufacturer is available on the computer supporting the Microscope's data capture.

Logbook

The Logbook clocks in every activity by the authorized user as well as the final reading of the Fluorescence lamp which acts as an indicator of skipped readings as well as gives us information on what kind of samples are being analyzed using the particular equipment

First Level Tool Maintenance

The first level maintenance involves a weekly check of the vital part of the microscope namely,

1) Eye piece, Lens - for dirt

If dirt is found, the system owner must be notified who will then schedule an appointment with the Carl Zeiss engineer for a cleanup.

Dust and dirt are very common as the environment in which the microscope is placed is not a clean room and thus invites a lot of unwanted entities as well.

The Carl Zeiss engineer has himself instructed us not to try and clean up any of the internal components because each one is extremely expensive.

2) Fluorescence lamp

If the intensity of the lamp or any of its filters is seen to be different, it must be reported and the engineer must be notified of the issue.