Claims

1. A microscope module (300) for a microscope arrangement (200) for imaging one or more samples (40, 270), the one or more samples (40, 270) being located in a culture medium (280), the microscope arrangement (200) comprising

    - a light source (20) for generating an illumination beam along an illumination beam path (215), the illumination beam path (215) being arranged to illuminate lower surfaces~~, including bottom and side surfaces,~~ of the one or more samples (40, 270), and
    - a detector (50) for detecting emitted light along a detection beam path,

    wherein the microscope module (300) comprises:

    - a sample holder (240), removably arranged in the microscope arrangement (200), adapted for holding the one or more samples (40, 270) in the culture medium (280), and having a bottom (260), the bottom (260) being at least partially transparent to the illumination beam and to the emitted light emitted from the one or more samples (40, 270),
    - at least one illumination objective (210), arranged in the microscope arrangement (200) to direct the illumination beam through the at least partially transparent bottom (260) onto the lower surfaces~~, including bottom and side surfaces,~~ of the one or more samples (40, 270);
    - at least one detection objective (220), arranged in the microscope arrangement (200) to collect the emitted light emitted from the one or more samples (270) through the at least partially transparent bottom (260) along the detection path (225);

    wherein the detection path (225) is at an angle to the illumination beam path (215);

    the illumination objective (210) and the detection objective (220) are located in an immersion medium (230), the immersion medium (230) being in contact with the at least partially transparent bottom (260) of the sample holder (240), and

the immersion medium (230) and the at least partially transparent bottom (260) of the sample holder (240) have substantially the same refractive index for reducing optical aberrations.

2. The microscope module (300) of claim 1, wherein the angle of the detection path (225) to the illumination beam path (215) is substantially orthogonal.

3. The microscope module (300) of claim 1 or 2, wherein the at least partially transparent bottom (260) of the sample holder (240) is made of a membrane (260) attached to walls (250) of the sample holder (240).

4. The microscope module (300) of any one of the claims 1 to 3, wherein the at least partially transparent bottom (260) of the sample holder (240) comprises a protrusion (290) adapted for holding the sample (270).

5. The microscope module (300) of claim 4 wherein the illumination beam is arranged to direct the illumination beam through a bottom (260) or a side wall of the protrusion (290).

6. The microscope module (300) of claim 5 ~~7~~, in which the protrusion (290) is elongated.

7. The microscope module (300) of any one of the claims 1-6~~8~~, wherein the illumination beam path is arranged at 30° to horizontal.

8. The microscope module (300) of any one of the claims 1-7, wherein the lower surfaces of the one or more samples comprise side surfaces and bottom surfaces of the sample.

~~8.~~9. The microscope module (300) of any of the above claims, wherein the refractive index of the culture medium (280) is substantially the same as the refractive index of the at least partially transparent bottom (260) of the sample holder (240).~~,~~

~~9.~~10. A method of imaging one or more samples (40, 270) comprising:

- placing one or more samples (40, 270) in a sample holder (240), the sample holder (270) having an at least partially transparent bottom

(260), and being adapted for holding the one or more samples (40, 270) in a culture medium (280);

- removably arranging the sample holder (40, 270) such that the at least partially transparent bottom (260) contacts an immersion medium (230), in which an illumination objective (210) and a detection objective (220) are located;
- generating an illumination beam along an illumination beam path (215) by passing light from a light source (20) through the illumination objective (210);
- illuminating through the at least partially transparent bottom (260) lower surfaces~~, including bottom and side surfaces,~~ of the one or more samples (40, 270) with the illumination beam;
- detecting along a detection path (225) with the detection objective (22) emitted light from the one or more samples (40, 270) through the at least partially transparent bottom (260); and
- creating an image of the one or more samples (40, 270);

wherein the detection path (225) is at an angle to the illumination beam path (215); and

wherein the immersion medium (230) and the at least partially transparent bottom (260) of the sample holder (240) have substantially the same refractive index for reducing optical aberrations.

~~10.~~11. The method of claim 10~~ 9~~, further comprising selecting different ones of the one or more samples (40, 270).

~~11.~~12. The method of claim 10~~ 9~~ or 11~~ 10~~, wherein the placing comprises placing the one or more samples (40, 270) in a protrusion (290) of at least partially transparent bottom (260) of the sample holder (240).

~~12.~~13. The method of claim 12~~ 11~~, wherein the illuminating further comprises illuminating the one or more sample (40, 270) through a bottom (260) or a side wall of the protrusion (290).

14. The method of one of claims 10 to 13, wherein the illuminating the lower surfaces of the one or more samples comprises illuminating at least one of side surfaces or bottom surfaces.

~~13.~~15. The method of one of claims ~~9~~ 10 to 14 ~~12~~, wherein the refractive index of the culture medium (280) is substantially the same as the refractive index of the at least partially transparent bottom (260) of the sample holder (240).