

In the Claims:

1. – 8. (Cancelled)

9. (New) A device, comprising:

(a) a stage, comprising:

(i) a sample holder, wherein said sample holder is configured to receive a solid substrate comprising a biological sample,

(ii) a heating or cooling apparatus programmable for a time and temperature parameter, wherein said heating or cooling apparatus is operationally connected to said sample holder, and

(iii) a multi-axis motion control system programmable for XY motion control of said stage;

(b) a fluidics system configured to dispense one or more reagents to said sample holder, wherein said fluidics system comprises:

(i) one or more reservoirs for containing said one or more reagents;

(ii) a fluidics dispenser configured to dispense said one or more reagents into said sample holder, wherein said fluidics dispenser is fluidically connected to said one or more reservoirs,

(iii) a pump that facilitates the dispensation of a programmed volume of fluid from at least one reservoir of said one or more reservoirs to said sample holder, and

(c) an optical system configured for volumetric imaging of said biological sample, wherein said optical system comprises:

(i) an objective,

(ii) a Z-axis motion control system operatively connected to one or more components of said optical system, wherein said Z-axis motion control system is configured for Z motion of an objective focal plane through said biological sample,

(iii) a light source configured to deliver light to said biological sample, and

(iv) one or more detectors positioned in light receiving communication with said sample holder, wherein said one or more detectors receives light intensity signals which are processed into a three-dimensional volumetric image of said biological sample.

10. (New) The device of claim 9, wherein said solid substrate is a flow cell.

11. (New) The device of claim 10, wherein said flow cell is a closed flow cell.
12. (New) The device of claim 11, wherein said closed flow cell comprises a fluid inlet and a fluid outlet, and wherein said fluid inlet comprises said fluidics dispenser.
13. (New) The device of claim 10, wherein said flow cell is an open flow cell.
14. (New) The device of claim 9, wherein said objective is a water immersion objective.
15. (New) The device of claim 9, wherein said objective is a water dipping objective.
16. (New) The device of claim 9, wherein said heating or said cooling apparatus comprises a heat sink or a Peltier element.
17. (New) The device of claim 9, wherein said heating or said cooling apparatus comprises a temperature sensor for providing temperature feedback to a thermal control system.
18. (New) The device of claim 9, wherein said multi-axis motion control system is programmable for XYZ motion control of said stage.
19. (New) The device of claim 9, wherein said pump is a syringe pump.
20. (New) The device of claim 9, wherein said fluidics system further comprises one or more valves downstream of said one or more reservoirs and upstream of said fluidics dispenser, wherein, upon actuation, said one or more valves facilitate dispensation of said programmed volume of fluid to said sample holder.
21. (New) The device of claim 20, wherein said one or more valves comprise a rotary valve.

22. (New) The device of claim 20, wherein said one or more valves comprise a solenoid valve or a microfluidic valve.

23. (New) The device of claim 13, wherein said fluidics system further comprises an aspiration system configured to remove liquid from said open flow cell, wherein said aspiration system comprises an aspiration tube that removes liquid from said open flow cell and a pump or vacuum source operatively coupled to said aspiration tube.

24. (New) The device of claim 23, wherein said aspiration tube is operatively coupled to a motor, wherein said motor is configured to adjust a motion axis of said aspiration tube to control an interface between said aspiration tube and said flow cell.

25. (New) The device of claim 24, wherein said motor is a stepper motor.

26. (New) The device of claim 9, wherein said Z-axis motion control system comprises a Z-axis linear motor configured for Z motion of said objective focal plane through said biological sample.

27. (New) The device of claim 26, further comprising a linear encoder configured to provide Z motion feedback to said Z-axis linear motor.

28. (New) The device of claim 9, further comprising an objective wetting apparatus.

29. (New) The device of claim 9, wherein said light source comprises one or more light emitting diodes (LEDs).

30. (New) The device of claim 9, said light source comprises one or more lasers.

31. (New) The device of claim 9, wherein said optical system further comprises one or more emission filters and one or more excitation filters for directing certain wavelengths of light within said optical system.

32. (New) The device of claim 31, wherein said one or more excitation filters are configured to provide light having a wavelength of about 480 nm, about 530 nm, about 590 nm, or about 640 nm to said biological sample.

33. (New) The device of claim 31, wherein said one or more emission filters are configured to provide light having a wavelength of about 510 nm, about 570 nm, about 620 nm, or about 680 nm to said one or more detectors.

34. (New) The device of claim 9, wherein said optical system is mechanically, electrically, or electromechanically coupled with a controller system configured to synchronize one or more imaging events within said device.

35. (New) The device of claim 9, where said device comprises a vibration control rigid foundation.

36. (New) The device of claim 9, further comprising, one or more microprocessors with software for automating or controlling said dispensation of said one or more reagents into said sample holder.

37. (New) The device of claim 9, further comprising, one or more microprocessors with software for automating or controlling said time and temperature parameter of said heating or cooling apparatus.

38. (New) The device of claim 9, further comprising, one or more microprocessors with software for automating or controlling image detection and acquisition of said optical system.