CLAIMS

WHAT IS CLAIMED IS:

1. An assembly comprising:

a stage having a sample positioning surface configured to receive a sample holder;

a lid comprising an aperture, wherein the lid and the stage have a coupled configuration and an uncoupled configuration such that, when in the coupled configuration, a recess is formed by at least an interior wall of the lid and the sample positioning surface, wherein the aperture defines an opening to the recess; and

one or more light sources configured to direct light within the recess.

2. The assembly of claim 1, wherein the one or more light sources are disposed in the recess.

3. The assembly of claim 1, wherein the one or more light sources comprise one or more light emitting diodes (LEDs).

4. The assembly of claim 1, wherein the one or more light sources are configured to edge light the sample holder.

5. The assembly of claim 4, further comprising the sample holder positioned on the sample positioning surface, wherein the sample holder comprises a glass support.

6. The assembly of claim 5, wherein the one or more light sources are positioned such that emitted light from the one or more light sources is guided to a sample on the glass support.

7. The assembly of claim 6, wherein the one or more light sources are positioned such that the emitted light from the one or more light sources is guided through the glass support to the sample.

8. The assembly of claim 1, wherein the lid extends from a first end to a second end, wherein the lid is rotatably coupled to the stage via a hinge at the first end.

9. The assembly of claim 8, further comprising a catch, wherein the lid further comprises a latch at the second end, wherein the latch is configured to releasably couple to the catch when the lid is in the coupled configuration.

10. The assembly of claim 8, wherein the one or more light sources are disposed in the hinge.

11. The assembly of claim 8, further comprising a cam plate, and the recess is further formed by at least a portion of the cam plate.

12. The assembly of claim 8, further comprising a cam pusher operably coupled to the hinge, wherein the cam pusher is configured to translate when the hinge is actuated.

13. The assembly of claim 12, wherein the cam pusher translates within a cam plate.

14. The assembly of claim 12, further comprising one or more cams rotatably coupled to a cam plate, wherein the sample positioning surface defines a plane, wherein each cam is operably coupled to the cam pusher and configured to rotate about an axis perpendicular to the plane.

15. The assembly of claim 14, wherein the plane is defined by an x-direction and a y-direction, wherein at least one of the one or more cams is configured to provide a force on the sample holder in the x-direction.

16. The assembly of claim 15, wherein at least one of the one or more cams is configured to provide a force on the sample holder in the y-direction.

17. The assembly of claim 16, wherein the cam plate comprises one or more pins configured to restrict motion of the sample holder in at least one of the x-direction and the y-direction.

18. The assembly of claim 17, wherein the lid comprises one or more pins configured to restrict motion of the sample holder in a z-direction, wherein the z-direction is perpendicular to the plane.

19. The assembly of claim 18, further comprising a riser module, wherein the riser module is operatively coupled to the sample positioning surface and is configured to provide a force against the sample holder in the z-direction when the sample holder is positioned on the sample positioning surface and the lid is in the coupled configuration.

20. The assembly of claim 19, wherein the riser module comprises at least one spring.

21. The assembly of claim 1, further comprising one or more temperature control apparatuses coupled to the stage and configured to adjust a temperature of the stage.

22. The assembly of claim 21, wherein the one or more temperature control apparatuses comprise one or more thermoelectric modules.

23. A method comprising:

providing the assembly of claim 1;

positioning the sample holder on the sample positioning surface, wherein the sample holder comprises a glass support; and

coupling the lid to the stage thereby securing the sample holder in the recess.

24. An assembly comprising:

a stage having a sample positioning surface configured to receive a sample holder, wherein the sample positioning surface defines a plane;

a cam plate;

a lid comprising an aperture, wherein the lid extends from a first end to a second end, wherein the lid is rotatably coupled to the stage via a hinge at the first end, wherein the lid and the stage have a coupled configuration and an uncoupled configuration such that, when in the coupled configuration, a recess is formed by at least an interior wall of the lid, the cam plate, and the sample positioning surface, wherein the aperture defines an opening to the recess;

one or more cams rotatably coupled to the cam plate, wherein each cam is configured to rotate about an axis perpendicular to the plane; and

a cam pusher operably coupled to the hinge and the one or more cams, wherein the cam pusher is configured to translate when the hinge is actuated to thereby rotate the one or more cams.

25. The assembly of claim 24, further comprising a catch, wherein the lid further comprises a latch at the second end, wherein the latch is configured to releasably couple to the catch when the lid is in the coupled configuration.

26. The assembly of claim 24, wherein at least a portion of the cam pusher is positioned in the cam plate.

27. The assembly of claim 24, wherein the plane is defined by an x-direction and a y-direction, wherein at least one of the one or more cams is configured to provide a force on the sample holder in the x-direction.

28. The assembly of claim 27, wherein at least one of the one or more cams is configured to provide a force on the sample holder in the y-direction.

29. The assembly of claim 28, wherein the cam plate comprises one or more pins configured to restrict motion of the sample holder in at least one of the x-direction and the y-direction.

30. The assembly of claim 29, wherein the lid comprises one or more pins configured to restrict motion of the sample holder in a z-direction, wherein the z-direction is perpendicular to the plane.

31. The assembly of claim 30, further comprising a riser module, wherein the riser module is operatively coupled to the sample positioning surface and is configured to provide

a force against the sample holder in the z-direction when the sample holder is positioned on the sample positioning surface and the lid is in the coupled configuration.

32. The assembly of claim 31, wherein the riser module comprises at least one spring.

33. The assembly of claim 24, further comprising one or more temperature control apparatuses coupled to the stage and configured to adjust a temperature of the stage.

34. The assembly of claim 33, wherein the one or more temperature control apparatuses comprise one or more thermoelectric modules.

35. A method comprising:

providing the assembly of claim 24;

positioning the sample holder on the sample positioning surface, wherein the sample holder comprises a glass support; and

coupling the lid to the stage thereby translating the cam pusher and securing the sample holder in the recess via the one or more cams.