WHAT IS CLAIMED IS:

1. A fluorescence detection instrument comprising:

a base;

a heating module disposed on the base and comprising plural heating holders, wherein each of the plural heating holders is adapted to accommodate a light-transmissive reaction container adapted to contain a fluorescent reaction mixture with at least one targeted fluorescent probe, respectively;

a detecting module disposed on the base and configured with the heating module to form plural detection channels, wherein the plural heating holders are located on the plural detection channels, respectively;

an illumination module; and

an actuation module disposed on the base, connected with the illumination module and adapted to drive the illumination module to move to at least one predetermined position to selectively match at least one combination of the heating holder on the corresponding detection channel.

2. The fluorescence detection instrument according to claim 1, wherein the illumination module comprises plural light sources and plural first filters, wherein the plural light sources are disposed relative to the plural first filters, respectively, and the light source and the first filter are configured to form a first optical axis.

3. The fluorescence detection instrument according to claim 2, wherein the light source comprises at least one of a single color LED, a laser diode, a mercury lamp, and a halogen light bulb.

4. The fluorescence detection instrument according to claim 2, wherein the plural light sources comprise at least two adjacent light sources adapted to provide the same color of light and at least two adjacent light sources adapted to provide the different colors of light, wherein the at least two adjacent light sources adapted to provide the same color of light are disposed at an end of the arrangement of the plural light sources.

5. The fluorescence detection instrument according to claim 2, wherein the illumination module comprises plural second filters relative to the plural first filters respectively, wherein the plural second filters are located between the detecting module and the heating module.

6. The fluorescence detection instrument according to claim 5, wherein the plural first filters and the plural second filters comprise single band pass filters.

7. The fluorescence detection instrument according to claim 5, wherein the plural first filters comprise excitation filters, and the plural second filter comprise emission filters.

8. The fluorescence detection instrument according to claim 2, wherein the detecting module comprises plural detectors and plural optic sets, wherein the plural detectors are disposed relative to the plural optic sets respectively, and the detector and the corresponding plural optic set are configured to form a second optical axis along the detection channel.

9. The fluorescence detection instrument according to claim 8, wherein the detector comprises at least one of a silicon photodiode, a photomultiplier tube, a charged-couple device, a complementary metal-oxide semiconductor, and an avalanche photodiode.

10. The fluorescence detection instrument according to claim 8, wherein each of the plural optic sets comprises at least one condensing optic located nearby the heating module and at least one imaging optic located nearby the corresponding detector.

11. The fluorescence detection instrument according to claim 10, wherein each of the plural optic sets comprises an emission filter disposed between the condensing optic and the imaging optic.

12. The fluorescence detection instrument according to claim 8, wherein each of the plural heating holders comprises a heating chamber, a first optical aperture, and a second optical aperture, wherein the first optical aperture and the second optical aperture are communicated with each other through the heating chamber, and the second optical aperture is located at the corresponding second optical axis.

13. The fluorescence detection instrument according to claim 12, wherein the diameter of the first optical aperture is ranged from 1 mm to 2.5 mm, and the diameter of the second optical aperture is ranged from 2 mm to 3 mm.

14. The fluorescence detection instrument according to claim 12, wherein while the illumination module is matched and aligned to the heating holder on the corresponding detection channel, the first optical axis and the corresponding second optical axis are crossed in the heating chamber through the first optical aperture and the second optical aperture respectively.

15. The fluorescence detection instrument according to claim 12, wherein while the first optical axis and the corresponding second optical axis are crossed in the heating chamber through the first optical aperture and the second optical aperture respectively, the corresponding second optical axis is tilted from the first optical axis at an angle, wherein the angle is ranged from 2 degrees to 12 degrees.

16. The fluorescence detection instrument according to claim 1, wherein the heating module further comprises a heater connected with the plural heating holders.

17. The fluorescence detection instrument according to claim 16, wherein the heater comprises a thermoelectric cooling heater for thermal cycling control.

18. The fluorescence detection instrument according to claim 16, wherein the heating module further comprises a heat sink connected to the heater.

19. The fluorescence detection instrument according to claim 1, wherein the actuation module comprises at least one actuator, wherein the actuator comprises at least one of a rotary actuator driven by fluid or vacuum pressure, a piezoelectric actuator, an electro-actuated polymer actuator, and an electromagnetic motor.

20. The fluorescence detection instrument according to claim 19, wherein the actuation module comprises a moveable support rack, wherein the illumination module is disposed on the moveable support rack and connected to the at least one actuator, wherein the at least one actuator is configured to drive the movable support rack and move the illumination module to selectively match the at least one combination of the

heating holder on the corresponding detection channel.

21. The fluorescence detection instrument according to claim 20, wherein the actuation module comprises a gear module and at least one guiding rail module, wherein the gear module is disposed between and connected with the actuator and the movable support rack, and the at least one guiding rail module is disposed between and connected with the moveable support rack and the base.

22. The fluorescence detection instrument according to claim 1, further comprising a moveable support rack, wherein the illumination module is disposed on the moveable support rack and connected to the actuation module, wherein the actuation module is configured to drive the movable support rack and move the illumination module to selectively match the at least one combination of the heating holder on the corresponding detection channel.

23. The fluorescence detection instrument according to claim 1, wherein the number of the combinations of the illumination module and the heating holder on the corresponding detection channel is less than the total number of the plural detection channels.