

CLAIMS

What is claimed is:

1. A magnetic bead purification system, comprising:

a housing;

5 a liquid path treatment system, main parts of the liquid path treatment system being provided inside the housing, the liquid path treatment system ~~being connectable to~~ includes a reagent barrel and a waste liquid barrel;

a sample addition needle group connected to the liquid path treatment system, the sample addition needle group being movable within the housing and connected to the liquid
10 path treatment system, so as to receive a reagent from the liquid path treatment system or to discharge a waste liquid to the liquid path treatment system;

a purification magnetic separation system, comprising a magnetic element, the purification magnetic separation system being controllable to apply a lateral magnetic force to a purification treatment position inside the housing or stop the application of the magnetic
15 force by the magnetic element; and

a purification station system movable between ~~at~~the purification treatment position inside the housing and a loading position outside the housing, the purification station system being adapted to load a container;

~~2. The magnetic bead purification system according to claim 1, wherein the magnetic~~
20 ~~element is a permanent magnet; the purification magnetic separation system is controlled to apply the magnetic force or to stop the application of the magnetic force by moving the magnetic element towards and away from the purification treatment position.~~

~~3. The magnetic bead purification system according to claim 2, wherein the~~
25 ~~purification magnetic separation system comprises a driving system, a sliding system and a transmission system, so as to move the magnetic element towards and away from the purification treatment position.~~

~~43. The magnetic bead purification system according to claim 1, A magnetic bead purification system, comprising:~~

a housing;

5 a liquid path treatment system, main parts of the liquid path treatment system being provided inside the housing, the liquid path treatment system includes a reagent barrel and a waste liquid barrel;

10 a sample addition needle group connected to the liquid path treatment system, the sample addition needle group being movable within the housing and connected to the liquid path treatment system, so as to receive a reagent from the liquid path treatment system or to discharge a waste liquid to the liquid path treatment system;

a purification magnetic separation system, comprising a magnetic element, the purification magnetic separation system being controllable to apply a lateral magnetic force to a purification treatment position inside the housing or stop the application of the magnetic force by the magnetic element; and

15 a purification station system movable between the purification treatment position inside the housing and a loading position outside the housing, the purification station system being adapted to load a container;

20 wherein the magnetic element is an electromagnet; the purification magnetic separation system is controlled to apply the magnetic force or to stop the application of the magnetic force by controlling on and off of the electromagnet.

54. The magnetic bead purification system according to claim 1, wherein the purification station system comprises a sliding system, and is driven by a driving device to move from the purification treatment position to the loading position.

25 65. The magnetic bead purification system according to claim 1, wherein the purification station system comprises a magnetic attraction block, so as to move from the loading position to the purification treatment position by the magnetic force of the magnetic element.

76. The magnetic bead purification system according to any one of claims 1 to 65, wherein when a container filled with a mixed liquid of incubated crude proteins and magnetic beads is mounted on the purification station system, and the purification station system moves into the purification treatment position, the purification magnetic separation system applies the lateral magnetic force to attract the magnetic beads onto a container wall of the container.

87. The magnetic bead purification system according to any one of claims 1, 54 and 65, wherein the purification station system comprises two purification station brackets, and each purification station bracket comprises at least one adaptation hole for a purification container.

98. The magnetic bead purification system according to claim 1, wherein the sample addition needle group is a variable-spacing sample addition needle group.

109. The magnetic bead purification system according to claim 98, wherein the variable-spacing sample addition needle group comprises a fixed type sample addition needle fixing block and a movable type sample addition needle fixing block which are configured to mount sample addition needles, and the movable type sample addition needle fixing block is movable to adjust a spacing between the sample addition needles in the sample addition needle group.

110. The magnetic bead purification system according to claim 109, wherein the variable-spacing sample addition needle group comprises more than one movable type sample addition needle fixing block.

121. The magnetic bead purification system according to any one of claims 1 and 98 to 110, wherein the sample addition needle group comprises an elastic mechanism configured for up-and-down trace movement of the sample addition needles.

132. The magnetic bead purification system according to any one of claims 1 and 98 to 110, wherein the sample addition needles of the sample addition needle group comprise waste discharging needle holes configured to discharge waste liquid and sample addition needle holes configured to add reagents.

143. The magnetic bead purification system according to claim 132, wherein the

sample addition needle holes are further configured for spray rinsing of the container wall and bubble blowing.

5 ~~15~~14. The magnetic bead purification system according to any one of claims 1 and ~~9~~8 to ~~11~~10, wherein the magnetic bead purification system further comprises a mechanical arm provided inside the housing, and the sample addition needle group is mounted on the mechanical arm to realize movement.

~~16~~15. The magnetic bead purification system according to any one of claims 1 and ~~9~~8 to ~~11~~10, wherein the magnetic bead purification system comprises a cleaning module for cleaning the sample addition needles.

10 ~~17~~16. The magnetic bead purification system according to claim ~~16~~15, wherein the cleaning module comprises cleaning liquid addition holes paired with the sample addition needles, a liquid discharging hole, a cleaning slot and a cleaning liquid discharging slot.

~~18~~17. The magnetic bead purification system according to claim 1, wherein the magnetic bead purification system further comprises a control system; and the control system
15 automatically controls operation of each component of the magnetic bead purification system according to settings.

~~19~~18. The magnetic bead purification system according to claim 1, wherein the magnetic bead purification system further comprises a contamination control system, and the contamination control system comprises a wind path filtering system and an ultraviolet
20 sterilization system.

~~20~~19. The magnetic bead purification system according to claim 1, wherein the purification station system comprises a fixing device to load a six-hole container.