

THE CLAIMED INVENTION IS:

1. A method of preparing a biological sample using a robotic liquid handler having an automated thermo cycler, the method comprising:
 - 5 amplifying, using the thermo cycler of the robotic liquid handler, a nucleic acid from the biological sample in a first volume of liquid in a first reaction vessel of a first type of reaction vessel having a larger-volume upper section and a smaller-volume lower section, wherein the first volume of liquid encompasses the smaller-volume lower section but not the larger-volume upper section of
10 the first reaction vessel; and
isolating, using the robotic liquid handler, the amplified nucleic acid in a second volume of liquid in a reaction vessel of the first type of reaction vessel, wherein the second volume of liquid encompasses the larger-volume upper section and the smaller-volume lower section of the reaction vessel.
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2. The method of claim 1, further comprising:
isolating, using the robotic liquid handler, the nucleic acid from the biological sample
in the first reaction vessel in which the nucleic acid was amplified.
- 20 3. The method of claim 2, further comprising:
chilling the nucleic acid isolated from the biological sample using the thermo cycler;
and
adding reagents to the biological sample.
- 25 4. The method of claim 2, further comprising heating the nucleic acid isolated from the biological sample in the lower section using a lower heating element of the thermo cycler proximate the lower section.
5. The method of any one of claims 1 through 4, wherein amplifying the nucleic acid
30 isolated from the biological sample comprises:
adding adapters and a master mix to the nucleic acid isolated from the biological sample in the lower section; and

incubating the lower section using a lower heating element of the thermo cycler proximate the lower section.

6. The method of claim 5, wherein isolating the amplified nucleic acid further comprises:
- adding beads to the amplified nucleic acid to increase specificity of targeted nucleic acid; and
- washing the isolated nucleic acid using ethanol to increase a volume of the amplified nucleic acid to fill the lower section and at least partially fill the upper section.
7. The method of claim 6, further comprising incubating the amplified nucleic acid in the lower section and the upper section using the lower heating element and an upper heating element proximate the upper section.
8. The method of any one of claims 1 through 7, further comprising performing a fragmentation reaction on the nucleic acid from the biological sample in a second reaction vessel of the first type of reaction vessel using the robotic liquid handler.
9. The method of any one of claims 1 through 8, further comprising performing an adapter-ligation reaction on the nucleic acid from the biological sample in the first reaction vessel using the robotic liquid handler.
10. The method of any one of claims 1 through 9, wherein the automated thermo cycler includes:
- a lower temperature-controlled zone configured to control the temperature of the smaller-volume lower section of the first type of reaction vessel; and
- an upper temperature-controlled zone configured to control the temperature of the larger-volume upper section of the first type of reaction vessel.
11. The method of claim 10, wherein the lower temperature-controlled zone is adapted for rapid thermocycling; and the upper temperature-controlled zone is adapted for targeted-temperature incubations.

12. The method of claim 10, wherein the upper temperature-controlled zone of the automated thermo cycler comprises a heater located in a heater block disposed alongside the larger-volume upper section of the first reaction vessel to control the temperature of the larger-volume upper section.
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13. The method of claim 1, further comprising:
- adding double-stranded library fragments and oligo probes to the lower section of the reaction vessel;
- heating the lower section to a first temperature above ambient to denature the double-
- 10 stranded library fragments into single-stranded library fragments;
- heating the upper section of the reaction vessel to a second temperature above the first temperature;
- reducing the first temperature to allow the oligo probes to bind to the single-stranded library fragments; and
- 15 adding streptavidin beads to the reaction vessel such that a volume of liquid in the reaction vessel extends into the upper section of the reaction vessel.
14. The method of any one of claims 1 through 13, wherein a first volume of the larger-volume upper section is greater than a second volume of the smaller-volume lower section,
- 20 wherein the second volume is about 100 μ l; and the first volume is about 900 μ l.
15. The method of any one of claims 1 through 14, wherein:
- the larger-volume upper section has a first wall thickness;
- the smaller-volume lower section has a second wall thickness; and
- 25 the first wall thickness is greater than the second wall thickness.