# CLAIMS

What is claimed is:

1. A system comprising:

a plurality of analytical modules, each configured for receiving a corresponding microfluidic disc and performing optical analysis of a corresponding biological sample,

wherein the plurality of analytical modules is capable of performing a suite of tests; and

wherein the plurality of analytical modules comprises two or more of:

an analytical module configured for receiving a first microfluidic disc and measuring one or more hematological parameters;

an analytical module configured for receiving a second microfluidic disc and performing an immunoassay; or

an analytical module configured for receiving a third microfluidic disc and performing a clinical chemistry analysis.

2. The system of claim 1, wherein analytical modules in the plurality of analytical modules are capable of performing optical analyses independently of each other or concurrently with each other.

3. The system of claim 1, further comprising:

a gripper configured for transporting the corresponding microfluidic disc to or from each of the one or more analytical modules;

a holder configured for holding one or more sample tubes;

a rocker configured for mixing or homogenizing one or more biological samples in the one or more sample tubes;

a capping/decapping device configured for decapping and/or recapping a cap from a sample tube in the one or more sample tubes;

a drawer configured for receiving consumables;

a pipetting device configured for pipetting the corresponding biological sample to the corresponding microfluidic disc;

a detection unit configured for one or more of:

(i) detecting any microfluidic failure on the microfluidic disc in each of the plurality of analytical modules;

(ii) detecting a position of the gripper, the holder, the rocker, the capping/decapping device, the drawer, or any combination thereof, thereby providing information for auto-calibration of the system; and

(iii) performing one or more assays;

a thermal management unit configured for maintaining the system at a predetermined temperature range; or

any combination thereof.

4. The system of claim 3, wherein the detection unit comprises one or more image cameras.

5. The system of claim 4 further comprising:

a housing comprising a door and a user interface;

a chassis; and

a gantry.

6. The system of claim 5 further comprising:

a controlling unit for operating the gripper, the holder, the rocker, the capping/decapping device, the drawer, the pipetting device, the plurality of analytical modules, the detection unit, the thermal management unit, or any combination thereof.

7. The system of claim 6, wherein the one or more analytical modules comprise at least three analytical modules powered by a single and unified architecture and capable of being performed in a modular and streamlined platform.

8. The system of claim 7, wherein the corresponding biological sample is aliquoted into the corresponding microfluidic disc for the optical analysis.

9. The system of claim 8, wherein the system is configured to accept a single consumable kit per sample.

10. The system of claim 9, wherein the one or more analytical modules are capable of providing a plurality of biomarkers results.

11. The system of claim 10, wherein the one or more analytical modules are capable of providing more than 5 biomarkers results.

12. The system of claim 11, wherein optical analysis of the corresponding biological sample is performed using a single workflow with user-selectable reporting.

13. The system of claim 12, wherein the system is automated.

14. The system of claim 13, wherein the system is configured to accept one or more sample tubes, homogenize one or more biological samples contained in the one or more sample tubes, and analyze the homogenized one or more biological samples without any user intervention.

15. The system of claim 14, wherein the system is configured to assess a quality of samples, reagents, and/or protocols, and/or wherein the system is configured to transmit information about a quality of samples, reagents, and/or protocols using telemetry information.