

Supplementary file

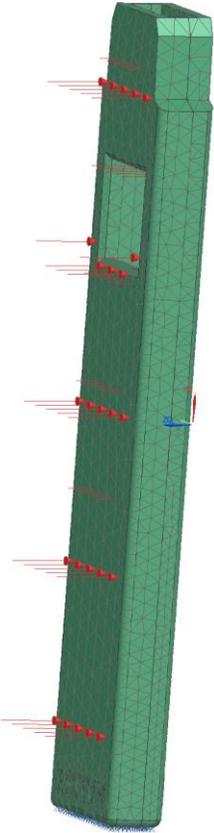


Figure S1. Force distribution being applied to the cassette during the simulation where one side is fixed.



Figure S2. CAD of the housing unit design 3D printed housing unit for the



Figure S3. CAD of the second iteration design 3D printed housing unit using material extrusion 3D printing. 3D printed housing unit using vat photo polymerization 3D printing.

First iteration of the housing cassette

NX CAD software was used to design the housing unit for the test. The initial iteration of the CAD design LFIA was designed to suit the geometry and the lateral flow assay requirement, as demonstrated in **Figure S1**. The design consists of an upper part with only two openings, one for the sample and the other for visualizing the tests' results. Moreover, the lower part was designed to provide support for the strip once added. Furthermore, vat photo polymerization 3D printing technology was used for prototyping this housing unit. The 3D printed prototype of this design is shown in Figure S2.

Second iteration of the housing cassette

To further compensate the challenges of the first iteration, the housing unit was altered to add a buffer well, as demonstrated in **Figure S2**. The reason behind adding a buffer well was to adapt the specific requirement from the lateral flow side. This iteration has an upper part with three openings: a buffer well, a patient sample well, and an extended opening for the test's result visualization. This iteration was prototyped using a material extrusion 3D printer and a vat photo polymerization printer to accumulate a higher print quality, as demonstrated in Figure S3.