

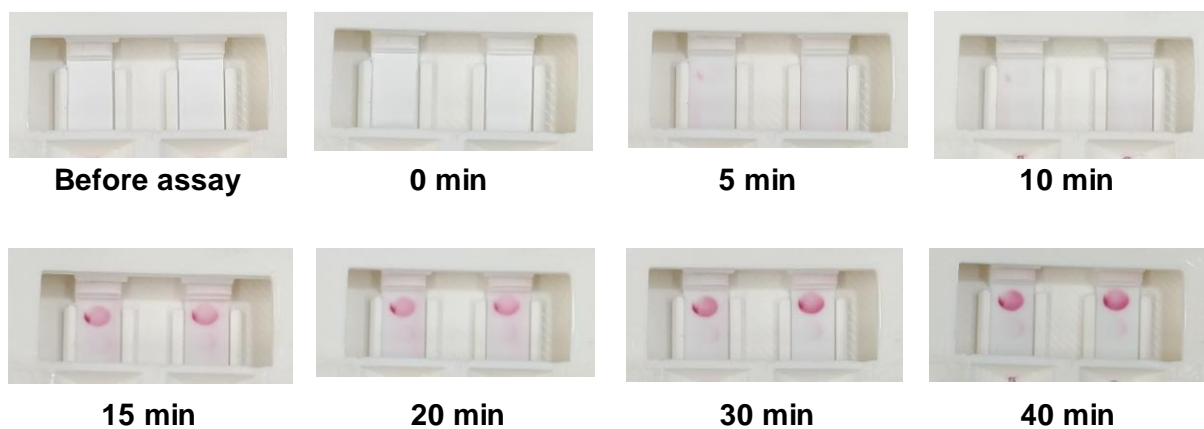
**Glycation ratio determination through simultaneous detection of human serum albumin and glycated albumin on an advanced lateral flow immunoassay sensor**

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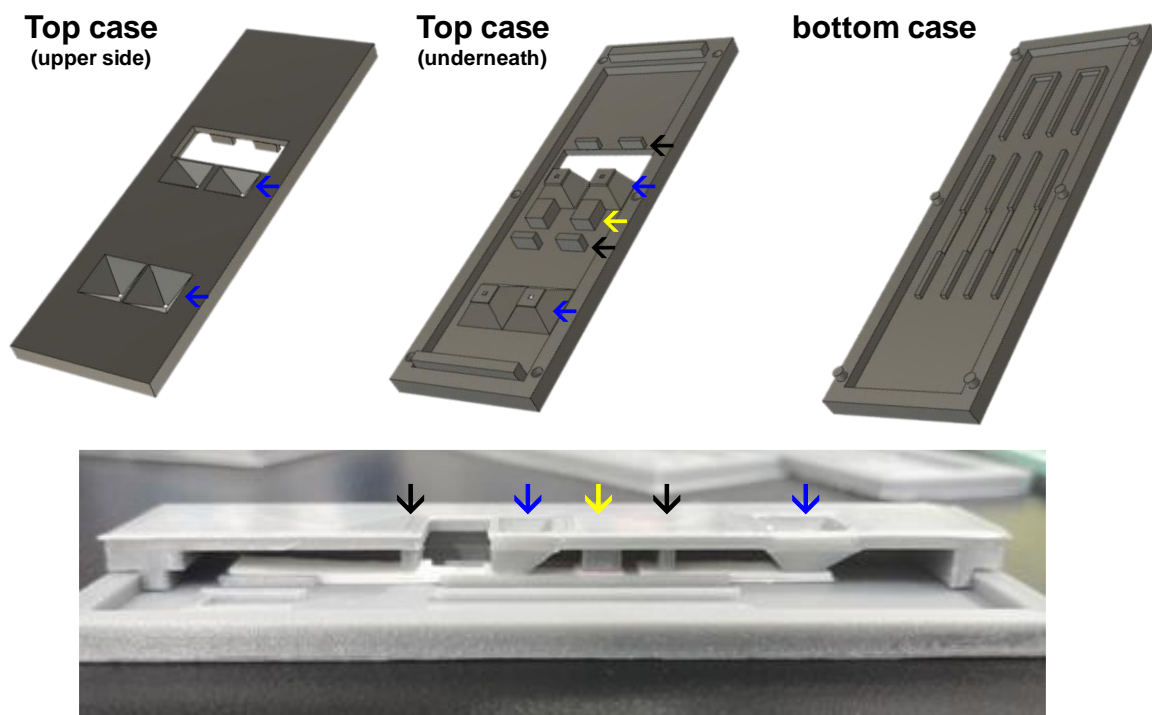
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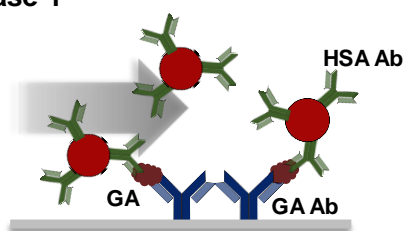


**Figure S1.** Digital images of advanced lateral flow immunoassay over reaction time.

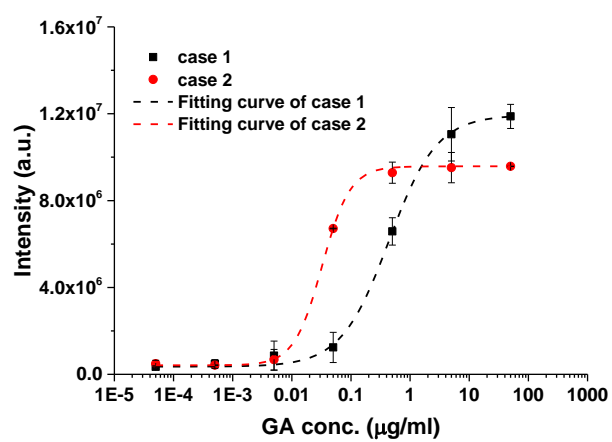
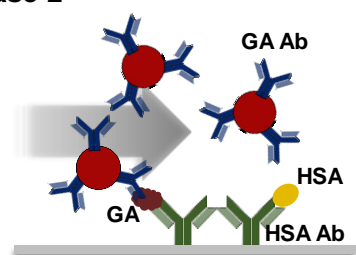


**Figure S2.** Designed top and bottom case and digital images of fabricated case with half-sliced top case on full-sized bottom case. Black arrow indicates pressuring component to sample and absorbent pad, blue arrow indicates sample and loading solution inlets with pressuring, and yellow arrow indicates pressuring component to integrated conjugate pad.

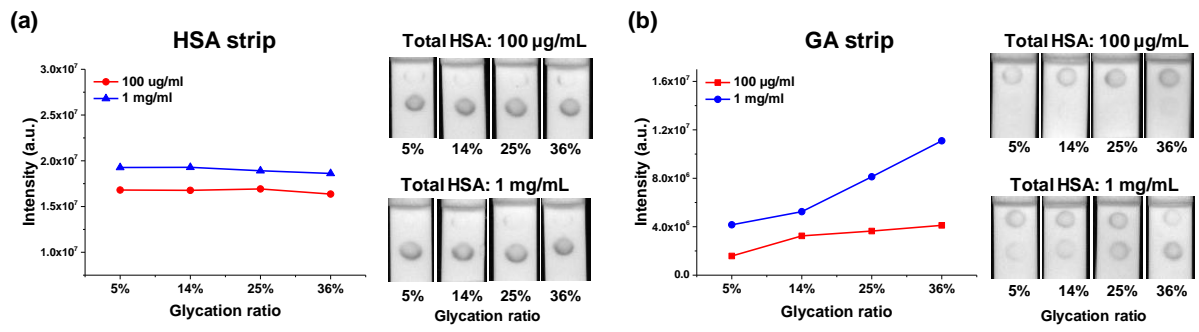
**Case 1**



**Case 2**



**Figure S3.** Comparison of titration curve for arrangement of HSA and GA antibody for evaluation of GA determination performance.



**Figure S4.** Detection performance of (a) total HSA and (b) GA using spiked HSA sample having different glycation ratio through the sequential dip-stick assay process and measured Chemidoc images.

**Table S1.** Analysis of HSA using commercialized enzymatic assay kit (Lucica GA-L) with automatic analyzer.

	Lyophilized HSA (LeeBioSols.) (spiked, 50 mg/ml)	Lyophilized HSA (Sigma) (spiked, 50 mg/ml)
Total HSA (mg/ml)	48.7	44.1
GA (mg/ml)	1.44	16.82
GA ratio (%)	5	36

**Table S2.** Analysis of serum samples using commercialized enzymatic assay kit (Lucica GA-L) with automatic analyzer.

	Human serum  (Sigma)	Human serum  (Innovative research)	Human serum  (Millipore)	Obesity serum  (LeeBioSols.)	Alzheimer's serum  (LeeBioSols.)	CRP-free serum  (Fitzerald)
Total HSA (mg/ml)	34.2	50	40.4	50.5	44	45.7
GA (mg/ml)	6.39	6.07	12.13	7.75	8.04	18.45
GA ratio (%)	19.3	13.3	29	16.3	19	38

**Table S3.** Detailed fitting parameters of total HSA and GA titration curves.

parameter	Total HSA strip	GA strip
Start	$4.252 \times 10^6$	$6.494 \times 10^6$
End	$1.239 \times 10^7$	$5.483 \times 10^7$
K	138664.277	4143.948
n	0.42145	0.57815
R-square	0.99514	0.99695