

Supporting information

for

Sliding-strip microfluidic device enables ELISA on paper

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Supporting Figures

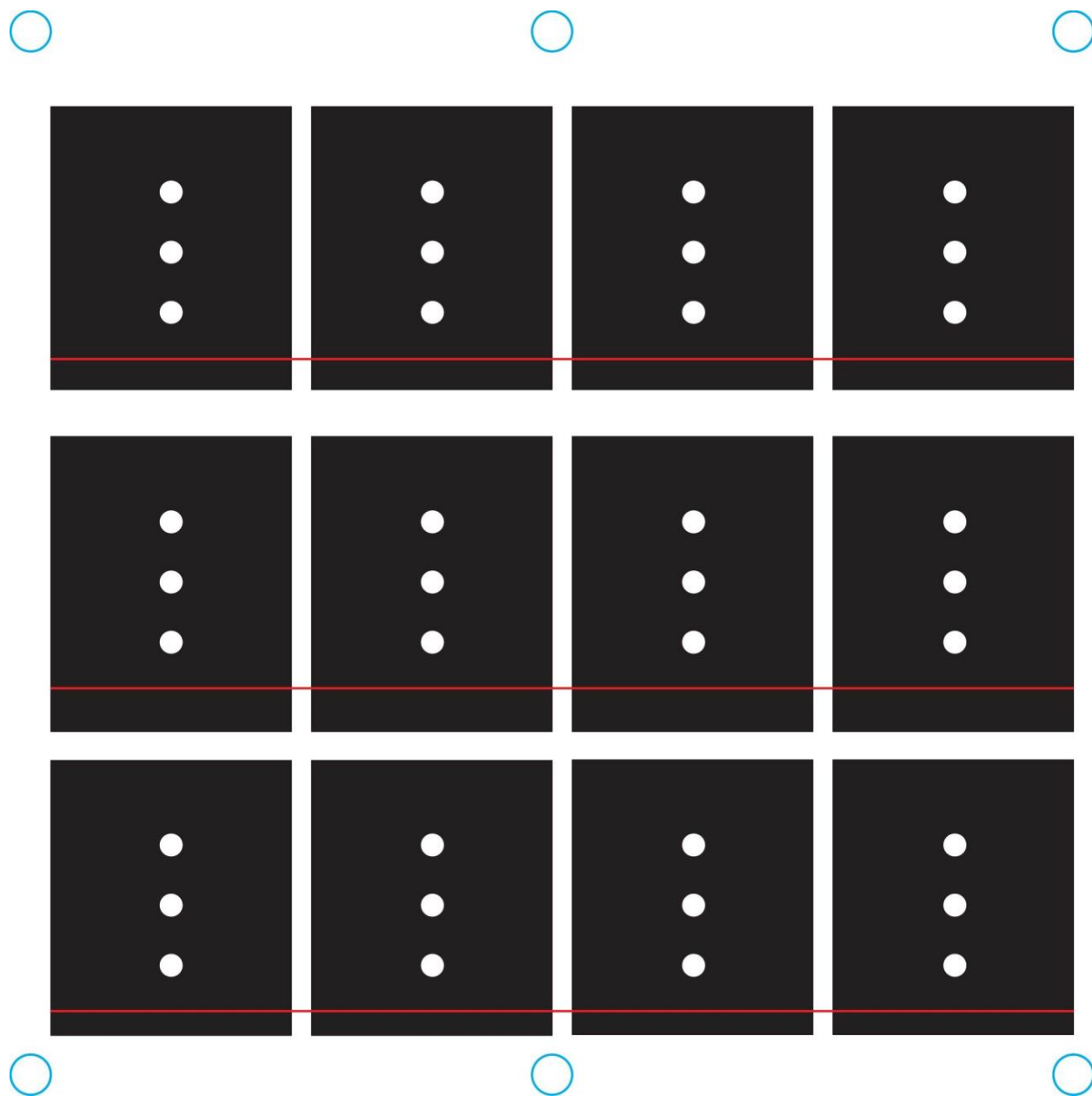


Figure S 1: Wax layout for inlet layer of the functional dock (to be printed on chromatography paper).

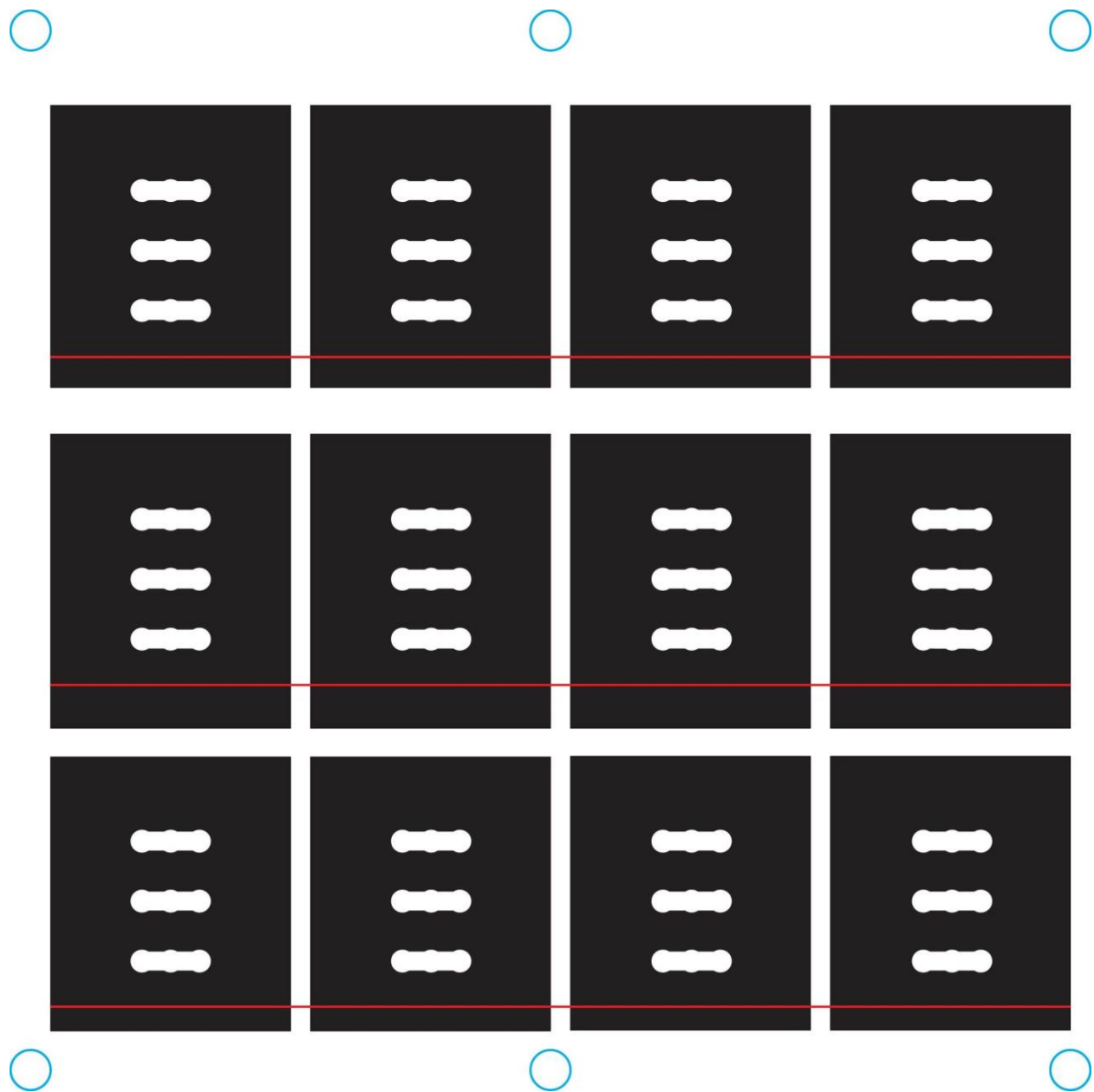


Figure S 2: Wax layout for splitting layer of the functional dock (to be printed on chromatography paper).

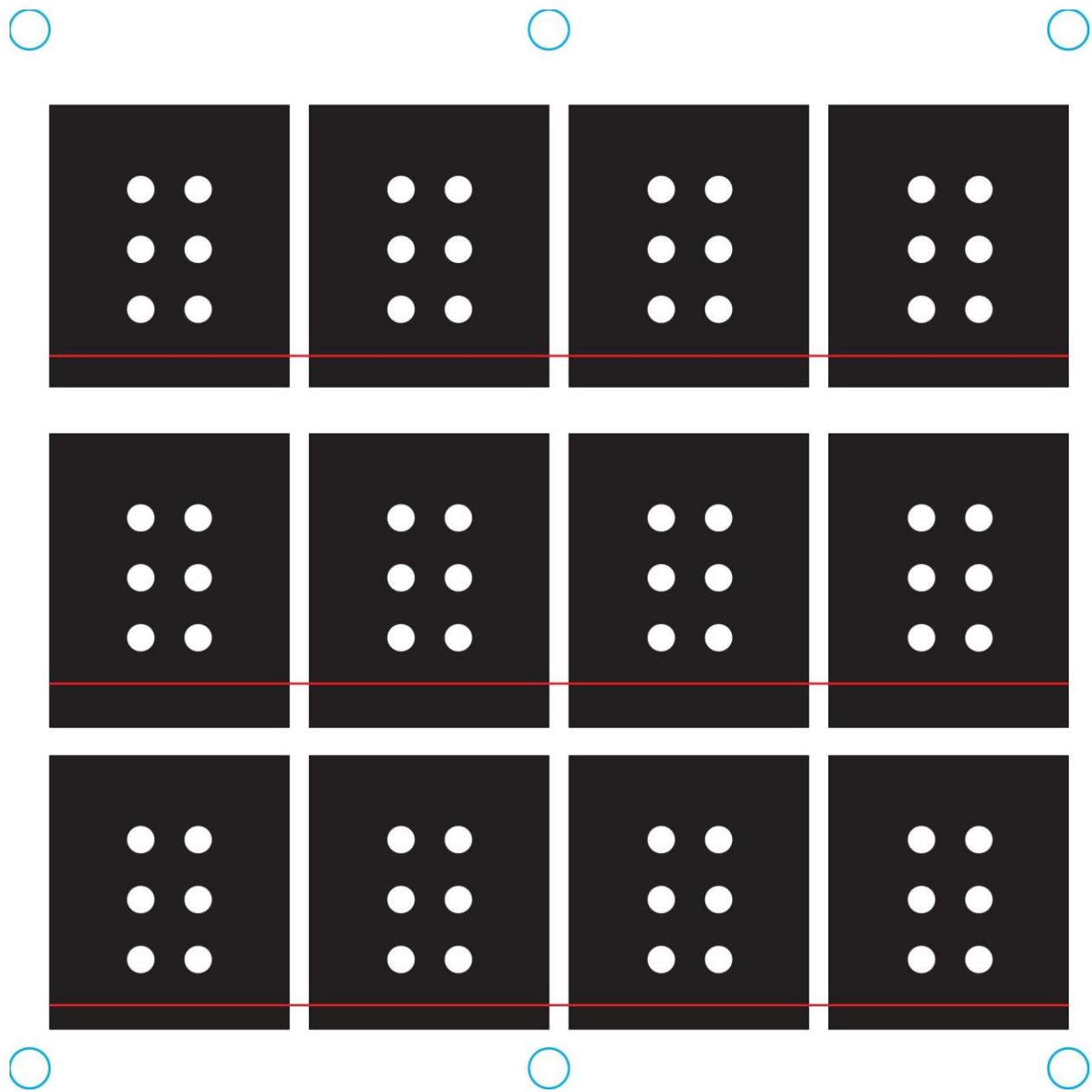


Figure S 3: Wax layout for storage and isolation layers of the functional dock (to be printed on chromatography paper).

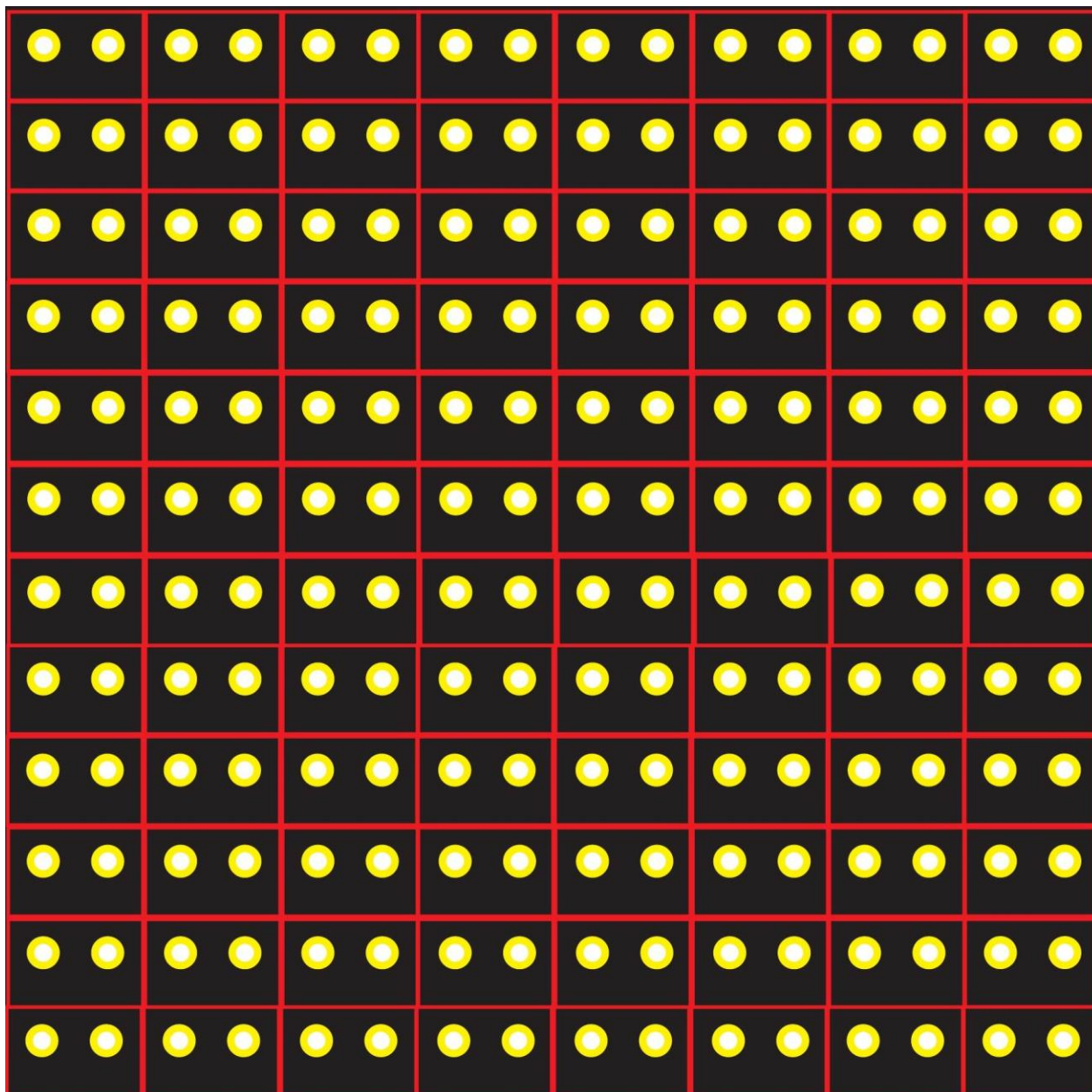


Figure S 4: Wax layout for sensing area (to be printed on nitrocellulose) of the sliding strip. The yellow circles are used around the white sensing area to provide a better contrast of the colorimetric output (purple-blue) compared to the black surrounding area.

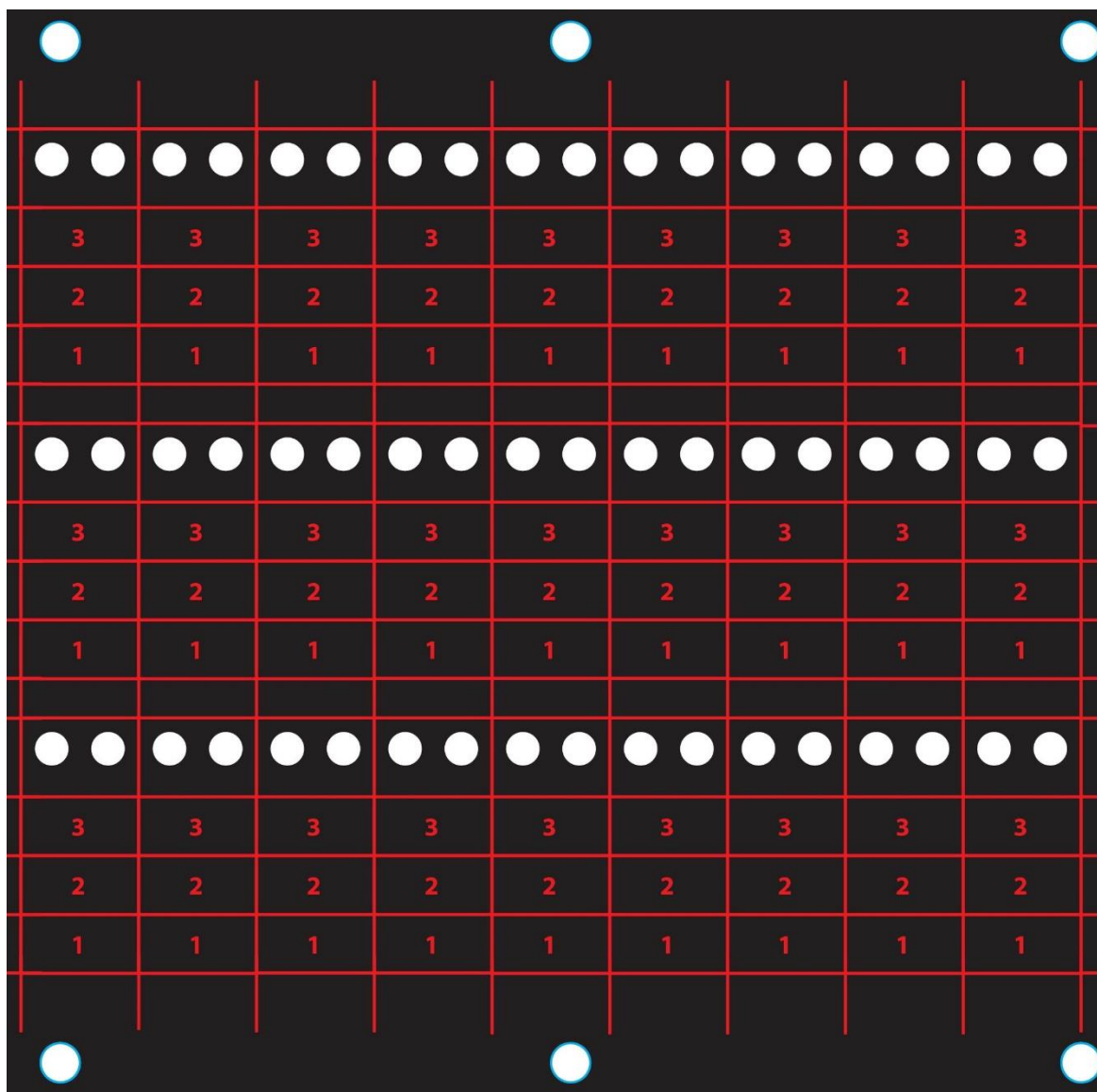


Figure S 5: Wax layout for the sliding strip backbone (to be printed on chromatography paper).

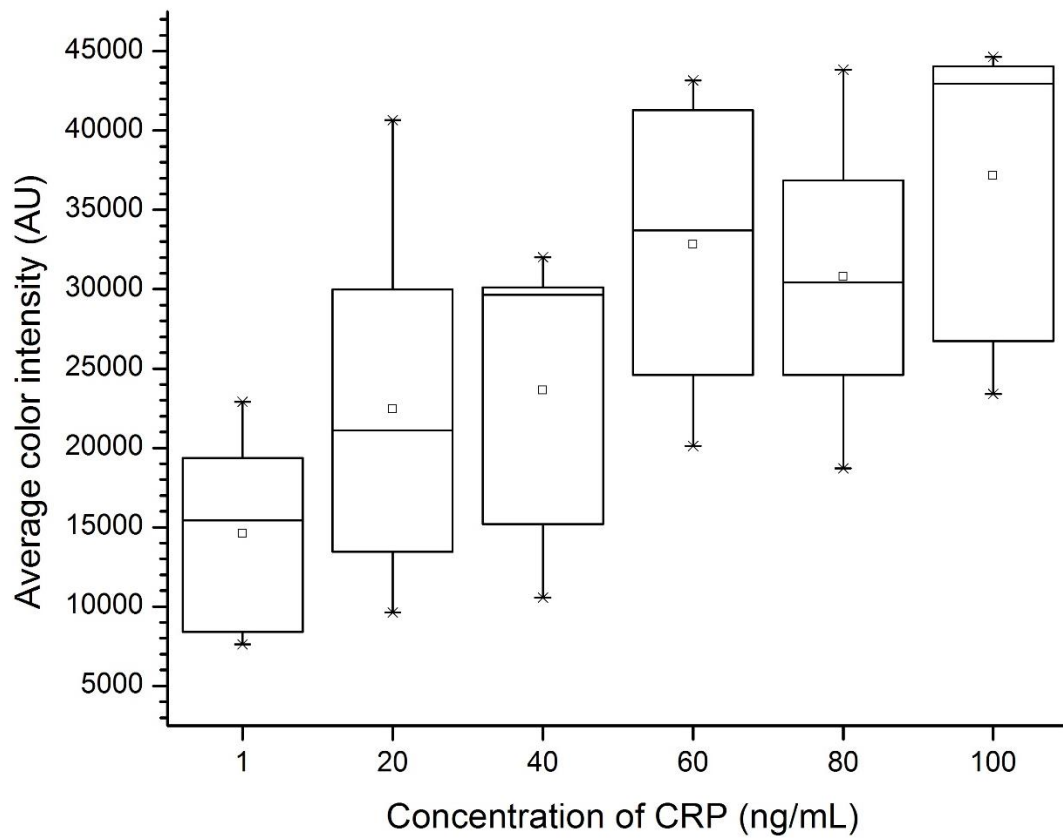


Figure S 6: Box plot of the colorimetric response (scatter plot is shown in Figure 2) from sliding-strip 3D μ PAD when detecting various concentrations of CRP spiked in sheep blood (n=7-8).

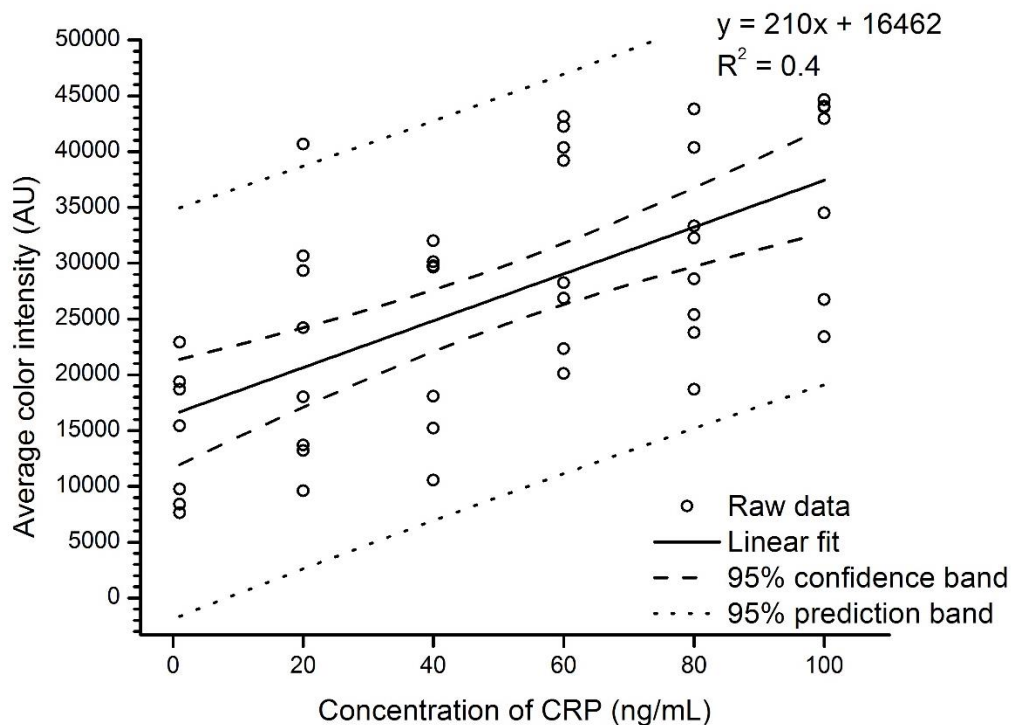


Figure S 7: Scatter plot of the colorimetric response of sliding-strip 3D μ PAD along with the linear fit and the 95% confidence band and 95% prediction band (calculated using OriginLab Origin $\text{\textcircled{R}}$ linear regression). The 95% confidence band estimates the confidence intervals for the fitted line such that a line of best fit of means would fall within the confidence band 95% of the time. The 95% prediction band estimates the region where 95% of the individual data points are expected to fall in future measurements.

Table S1: Bill of materials of a kit for sliding-strip 3D μ PAD (sorted by % contribution). Listed prices are those that a typical research laboratory would pay for the products.

Item	Supplier	Catalog #	Quantity	Units	Price (USD)	Unit price	Scrap rate	Corrected Unit Price	# of units/kit	Contribution to cost/kit	% Contribution to total cost
Detection antibody	Fisher Scientific	842677	1	mL	200	100.0000	0.1000	110.0000	0.0050	0.5500	26%
NBT/BCIP tablets	Sigma-Aldrich	11697471001	20	tablet	91	4.5500	0.1000	5.0050	0.0833	0.4171	19%
Grade 1 Chromatography paper 20 x 20 cm	VWR	21427-003	100	sheet	49.16	0.4916	0.1000	0.5408	0.5370	0.2904	13%
Capture antibody	Fisher Scientific	842676	1	mL	200	100.0000	0.1000	110.0000	0.0020	0.2200	10%
Extra Thick Blot Filter Paper, Precut, 19 x 18.5 cm	Bio-Rad	1703969	30	sheet	51.85	1.7283	0.1000	1.9012	0.0833	0.1584	7%
Nitrocellulose Membrane, Precut, 0.45 μ m, 15 x 15 cm	Bio-Rad	1620116	10	sheet	114.75	11.4750	0.1000	12.6225	0.0104	0.1315	6%
1 mL Syringe	VWR	53548-001	1800	item	187.83	0.1044	0.1000	0.1148	1.0000	0.1148	5%
8.5" x 350 ft. Flexmount double sided tape	Flexcon	DF051521	7	roll	544.32	77.7600	0.1000	85.5360	0.0010	0.0862	4%
1 μ L Disposable micropipette	VWR	53440-001	1000	item	62.42	0.0624	0.1000	0.0687	1.0000	0.0687	3%
2 mL Tube	VWR	53550-790	4000	item	115.38	0.0288	0.1000	0.0317	1.0000	0.0317	1%
Streptavidin alkaline phosphatase	Life Technologies	S921	0.5	mL	287	574.0000	0.1000	631.4000	0.0001	0.0316	1%
7.5 mL Disposable transfer pipet	VWR	414004-004	5000	item	74.38	0.0149	0.1000	0.0164	1.0000	0.0164	1%
Transparency film 8.5" x 11"	VWR	470022-010	100	sheet	36.18	0.3618	0.1000	0.3980	0.0370	0.0147	1%
Phosphate Buffered Saline with 10% Bovine Serum Albumin	Sigma-Aldrich	SRE0036-1L	1000	mL	124	0.1240	0.1000	0.1364	0.0999	0.0136	1%
10x Concentrate, Phosphate Buffered Saline	Sigma-Aldrich	P5493-4L	4000	mL	264	0.0660	0.1000	0.0726	0.1199	0.0087	0%
Teknova 10x detection buffer	VWR	100219-408	1000	mL	64.89	0.0649	0.1000	0.0714	0.0100	0.0007	0%
Tween® 20	VWR	97063-874	4000	mL	57.36	0.0143	0.1000	0.0158	0.0001	0.0000	0%
Total										\$2.15	100%

Table S2: Packaging cost of single kit

Pouching Cost- Single Device	Unit of Measure	\$/Unit	Scrap rate	Price	Devices	Cost/test
Foil Packaging	1000	93	10%	102.30	1000	0.1023
Desiccant	10000	300	10%	330.00	10000	0.033
Label Material for Packaging	Roll	25	10%	27.50	350	0.07857
Total Pouching Cost						\$0.21

Table S3: Overhead cost for production of devices

Overhead (Harvard)	Cost
Two FTE	200,000
2 FTE Cost/week	3,846
Overhead cost/device	One device
300 Devices/week	\$12.82
Overhead (Diagnostics For All)	
Two FTE	200,000
2 FTE Cost/week	3,846
Overhead cost/device	One device
2000 Devices/week	\$1.92