Distance-based Paper/PMMA Integrated ELISA-Chip for Quantitative Detection of Immunoglobulin G

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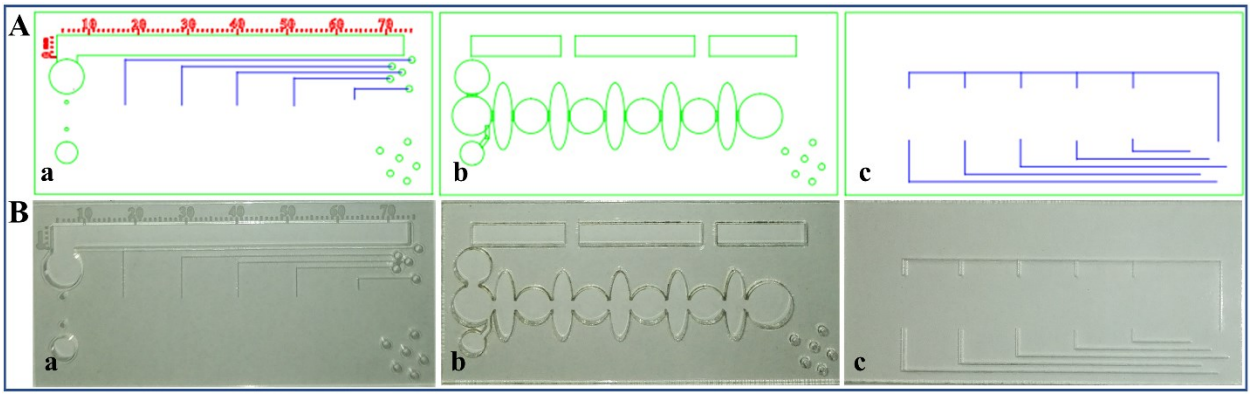

Fig. S1 (A). AutoCAD masks used for fabrication of the chip with three layers. (B). Pictures of the chip consisting of three layers. (a) Top PMMA layer, (b) Middle PMMA layer, (c) Bottom PMMA layer.

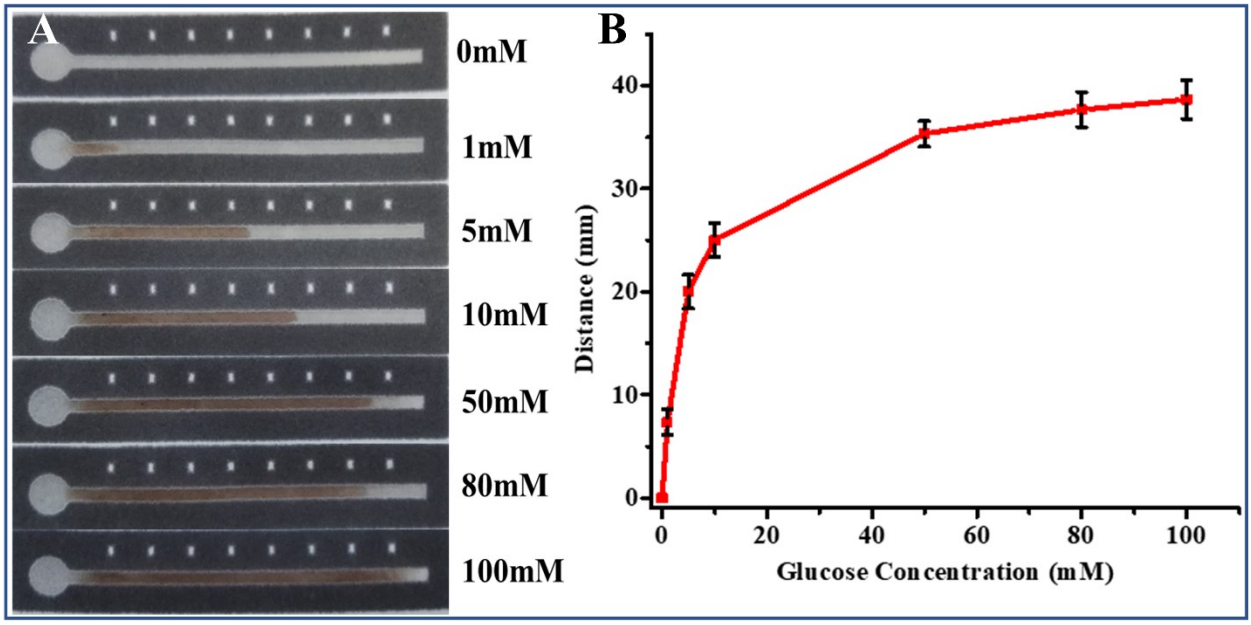

Fig. S2 (A) Response of μPAD to different concentrations of glucose in 20 min. (B) Relationship of μPAD bar distance against glucose concentration with the standard deviation obtained from three measurements.

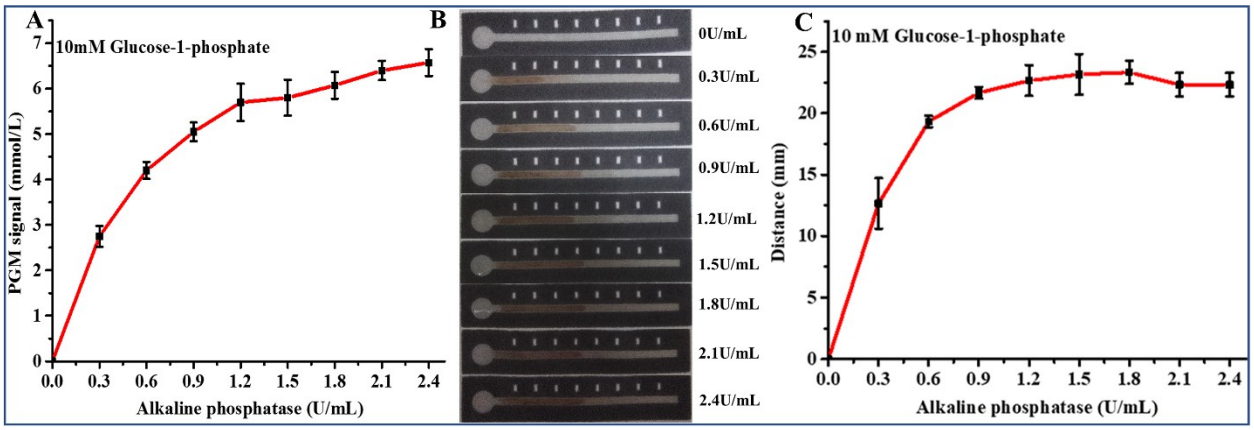

Fig. S3 (A) Enzyme ALP-catalyzed hydrolysis of glucose-1-phosphate for glucose production measured by PGM. (B) The response of μPAD to different concentrations of ALP-catalyzed hydrolysis of glucose-1-phosphate. (C) Relationship of μPAD bar distance plotted against different concentrations of ALP with the standard deviation obtained from three measurements.

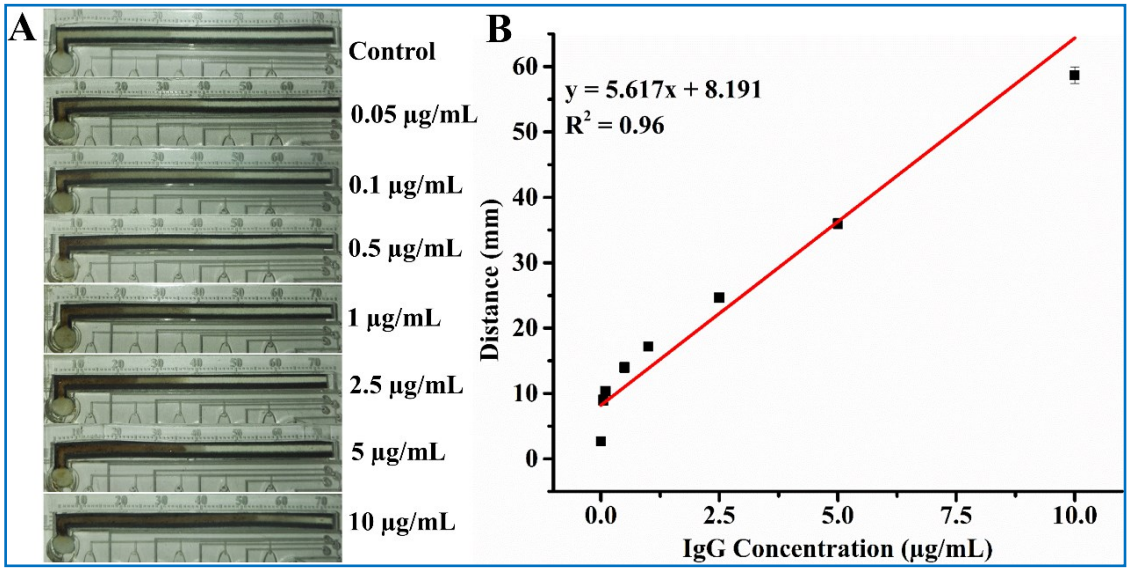

Fig. S4 (A) Distance change of μPAD with different concentrations of IgG in the buffer. (B) Linear standard curve of IgG concentration obtained from an average of triplicate samples for each point (0, 0.05 0.1, 0.5, 1, 2.5, 5, and 10 μg/mL) and the distance change in 20 min.

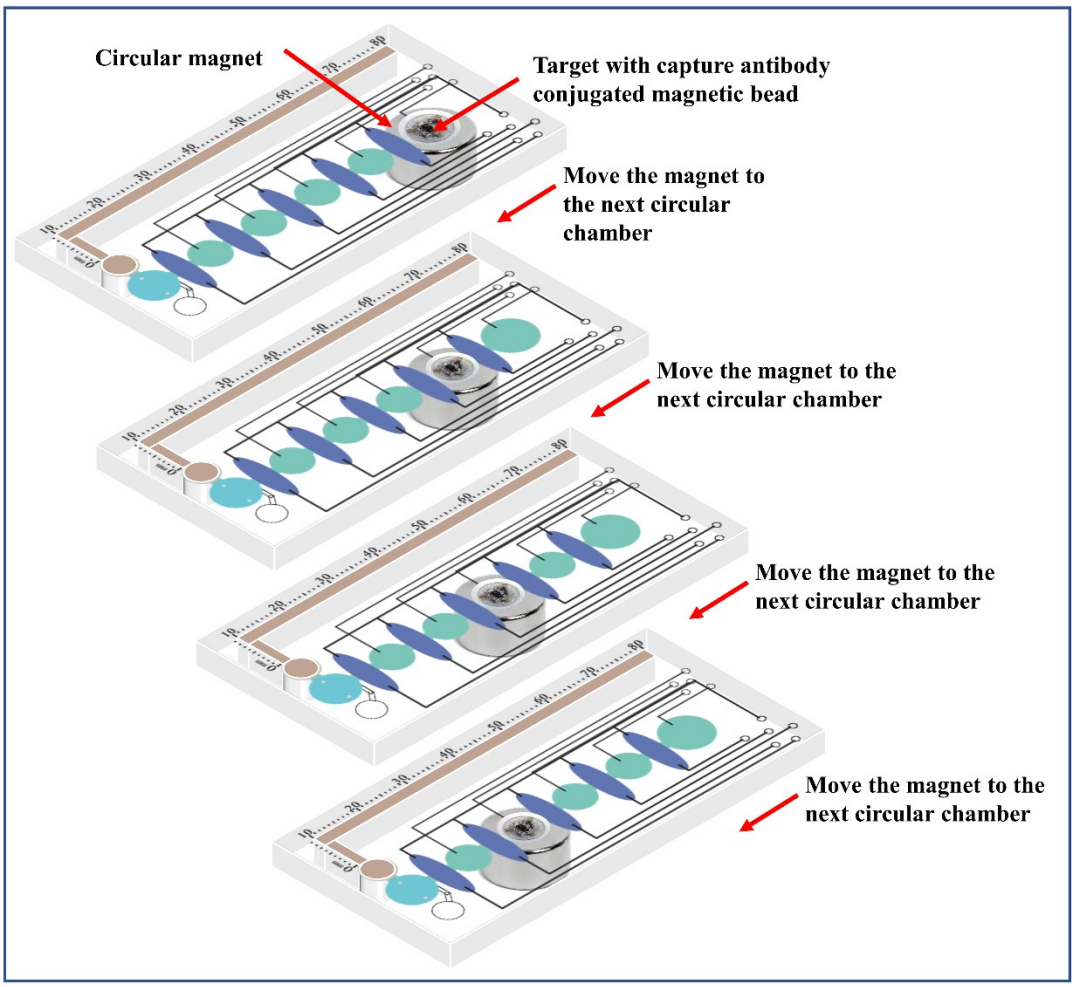

Fig. S5 Schematics describing the position and use of a magnet. After incubation of the sample with a magnetic bead conjugated antibody the magnet will place under the first circular chamber and dragged to the second circular chamber through an elliptic chamber for washing. After washing the binding target with antibody by tangling the magnet around the chamber it will transfer to the third chamber in the same manner as the first one. This process will continue until the target antibody complex arrived in the final circular chamber.

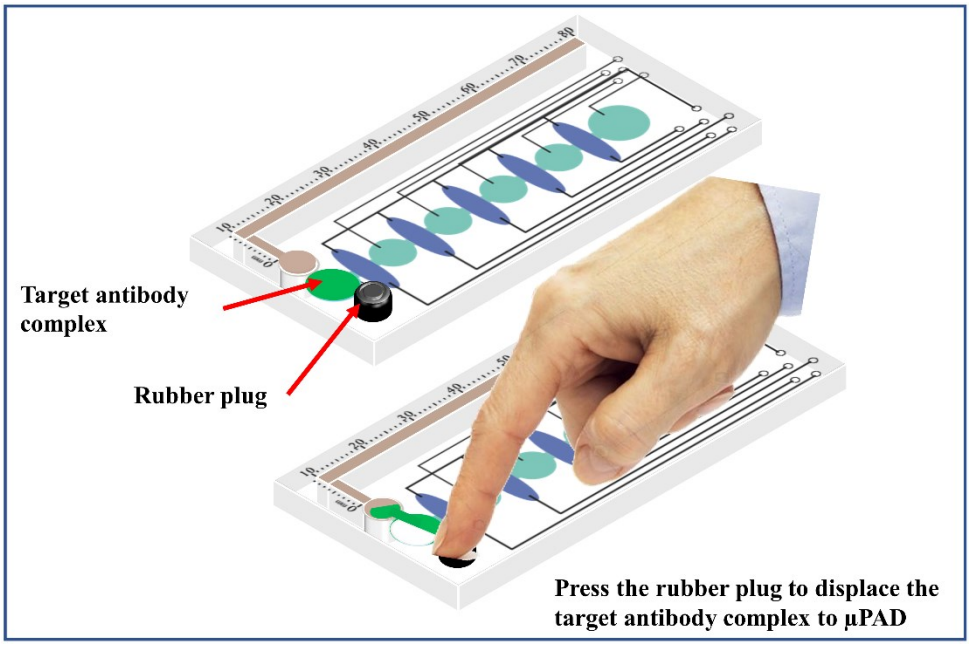

Fig. S6 Schematics showing how the rubber plug press button works in transferring the target-antibody complex to the µPAD.

Table S1. Inter-Assay and Intra-Assay Precision. CV (%) is calculated from (SD /Mean)*100. SD: Standard deviation. CV: Coefficient of variation (1 µg/mL IgG concentrations)**.**

	Measured Value (Mean, µg/mL)	**SD**	**CV (%)**
Inter-Assay Precision	2.7955	0.2605	9.3
Intra-Assay Precision	2.9045	0.1484	5.1