Supporting Information for

Rapid Sensing of Biological and Environmental Analytes Using Microwave-Accelerated Bioassays and a MATLAB Application

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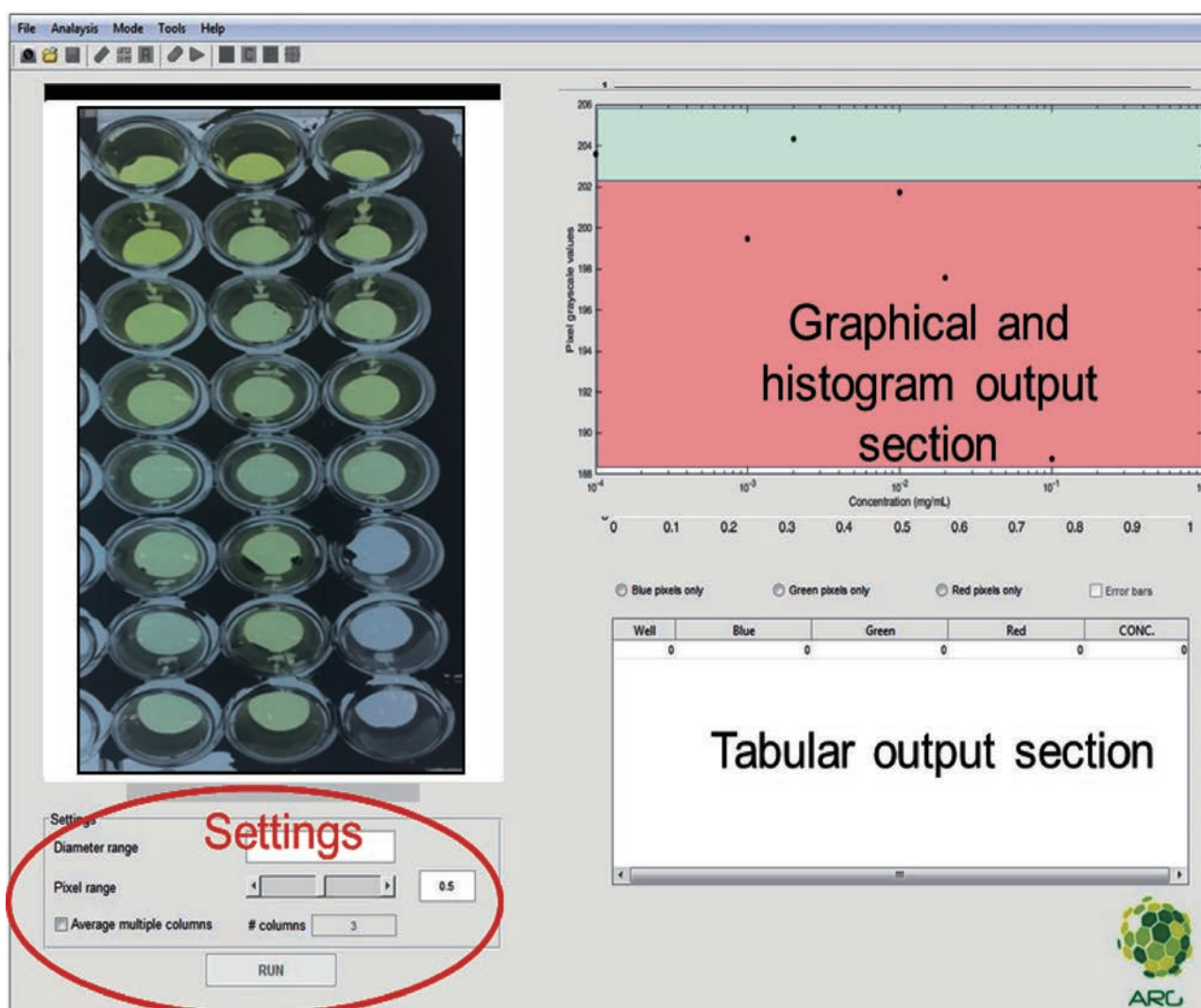✉ Corresponding author. E-mail: Kadir.Aslan@morgan.edu

Fig. S1 Layout for the MATLAB application with four sections: Image upload, graphical and histogram output, tabular output and settings sections.
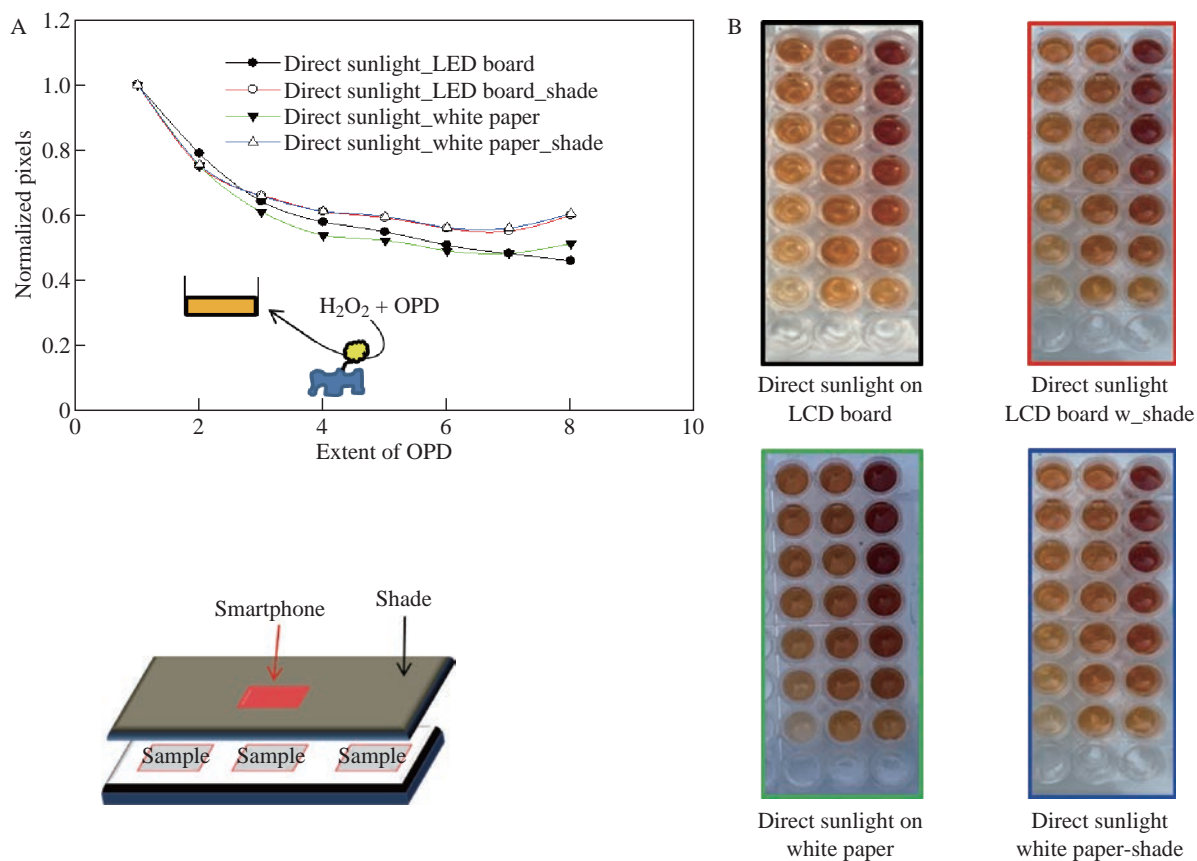
Fig. S2 Normalized pixels for enzymatic product o-phenylenediamine dihydrochloride (OPD) generated by varying volumes of OPD while maintaining the enzyme, streptavidin-horseradish peroxidase (Strep-HRP) constant (left panel) carried out in direct sunlight and under a shade. Real color images of OPD product samples exposed to direct sunlight (black and green solid line enclosure) and under a shade (red and blue solid line enclosure).
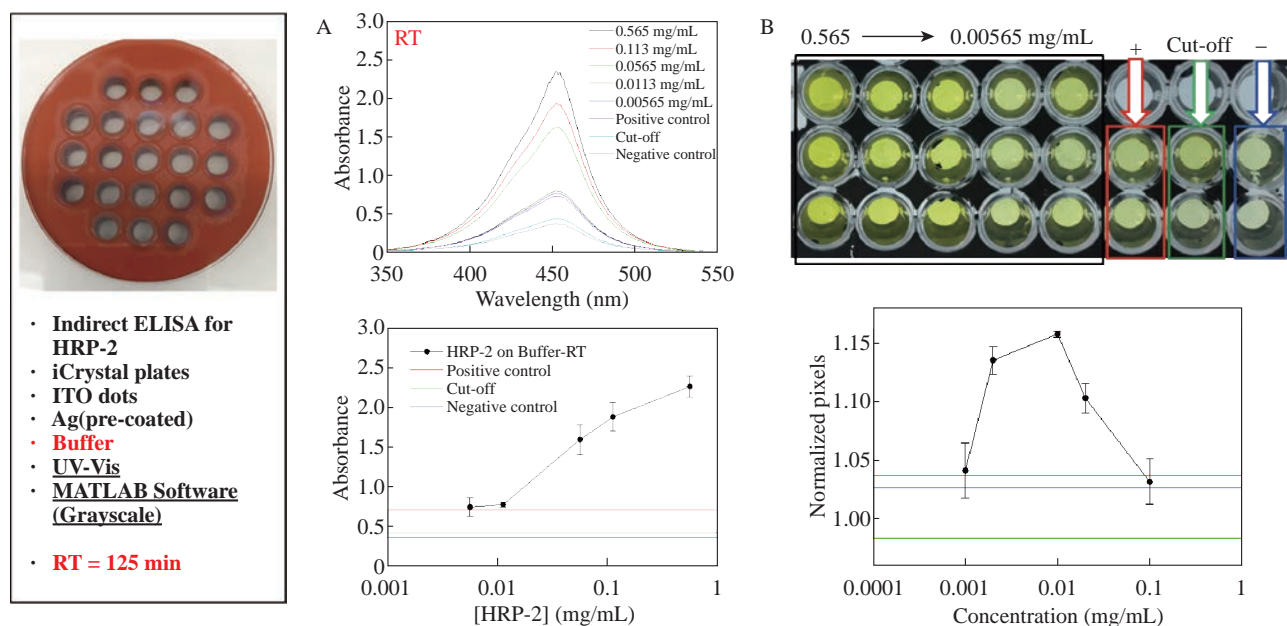
HRP-2 Assay in Buffer-RT

Fig. S3 Colorimetric response for HRP-2 assay in buffer **(a)** on modified ITO platform at room temperature, and **(b) Bottom panel**: Grayscale pixel values computed using the novel diagnostic software. **(b) Top panel**: The experimental samples (black solid enclosure,) and the control samples: Positive control (red solid enclosure), cut off (green solid enclosure), and negative control (blue solid enclosure). The substrate volume was increased 3-fold.
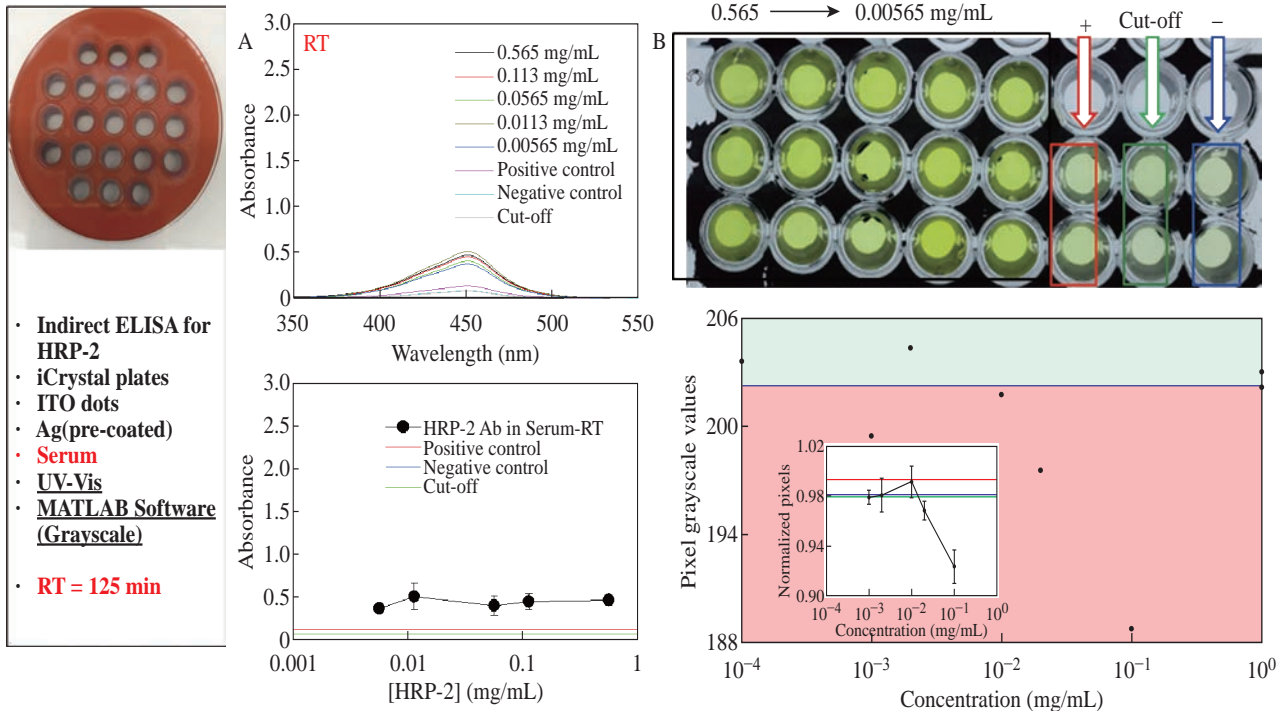
HRP-2 Assay in Serum-RT

Fig. S4 Colorimetric response for HRP-2 assay in serum **(a)** on modified ITO platform at room temperature, and **(b) Bottom panel**: Grayscale pixel values computed using the novel diagnostic software. **(b) Top panel**: The experimental samples (black solid enclosure) and the control samples: Positive control (red solid enclosure), cut off (green solid enclosure), and negative control (blue solid enclosure). The substrate volume was increased 3-fold.
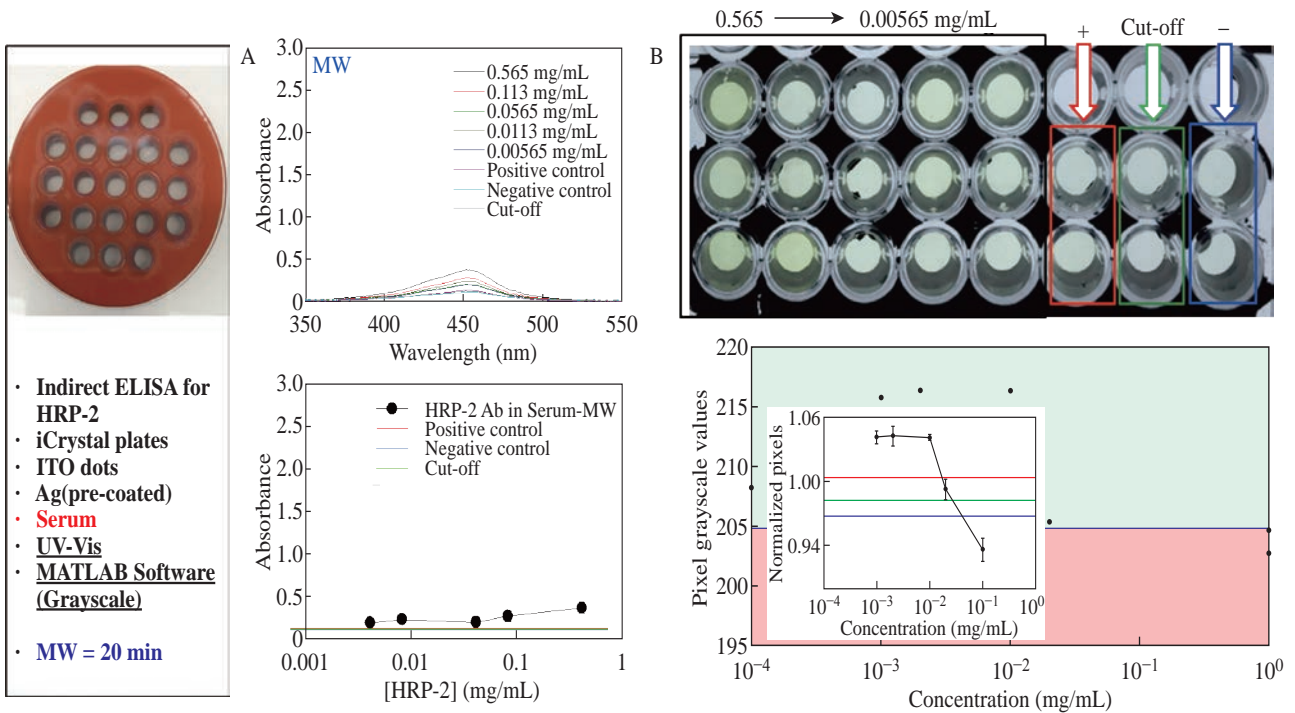
HRP-2 Assay in Serum-MW

Fig. S5 Colorimetric response for HRP-2 assay in serum **(a)** on modified ITO platform under low power microwave heating, and **(b) Bottom panel**: Grayscale pixel values computed using the novel diagnostic software. **(b) Top panel**: The experimental samples (black solid enclosure) and the control samples: Positive control (red solid enclosure), cut off (green solid enclosure), and negative control (blue solid enclosure). The substrate volume was increased 3-fold.
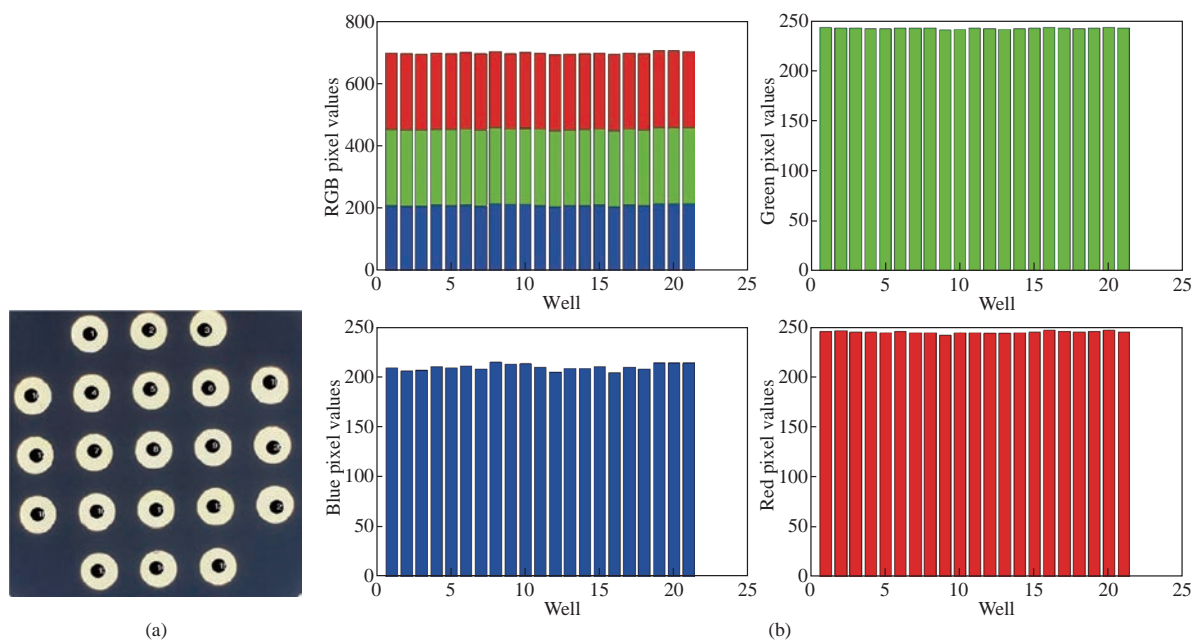
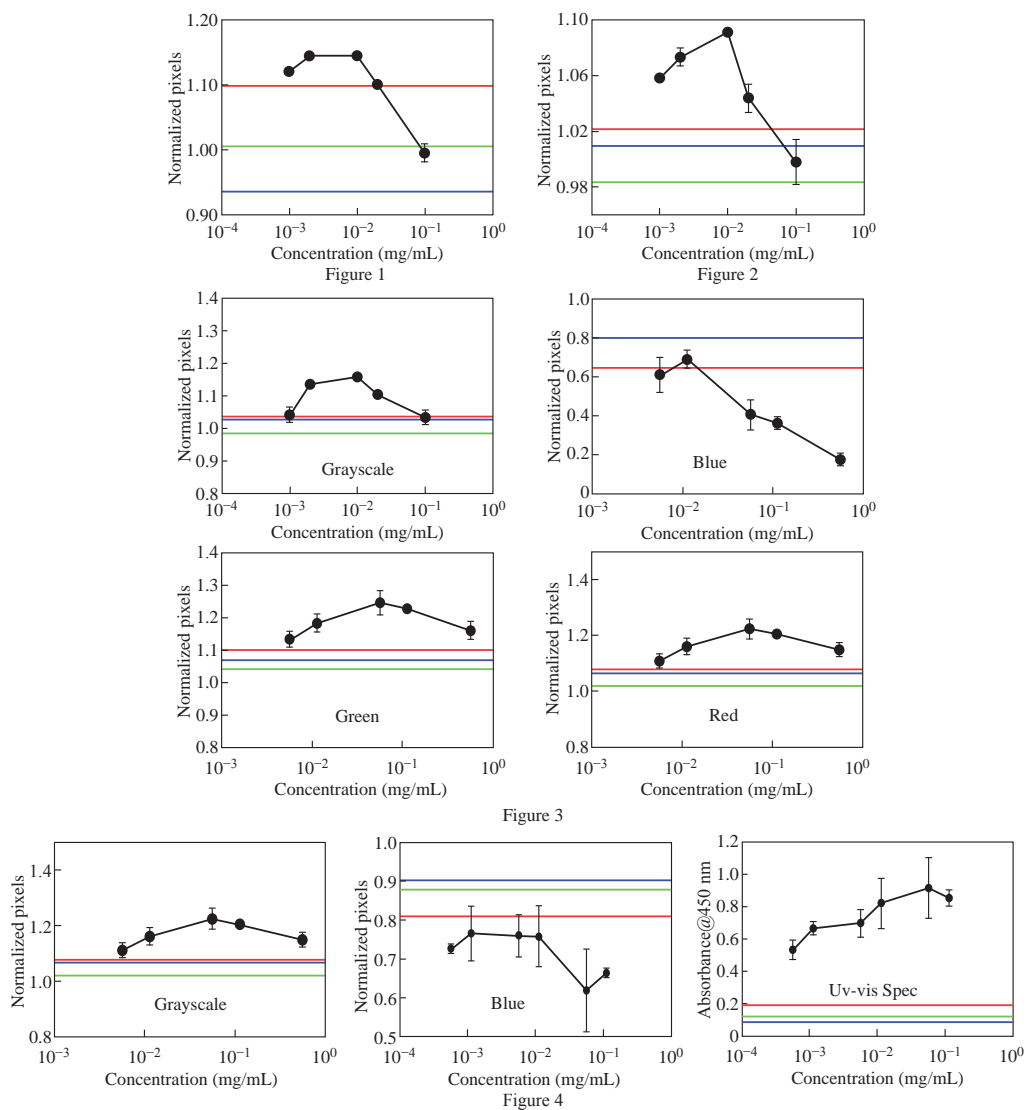**Fig. S6** RGB format pixel output for random test samples on **(a)** a 21-well iCrystal Plate, and **(b)** individual pixel intensity values for Green, Blue and Red colors.

Fig. S7 Insets for Fig.1, 2, 3 and 4.