SUPPLEMENTARY MATERIAL

Integration of Sample Preparation with RNA-Amplification in a Hand-Held Device for Airborne Virus Detection

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In addition to Figures S1-S5 and Table S1 below, online supporting materials also include two videos:

Video S1: The operation of three ball valves using food dye solutions.

Video S2: Demonstration of leak-free seal of the buffer unit containing a red food dye solution.

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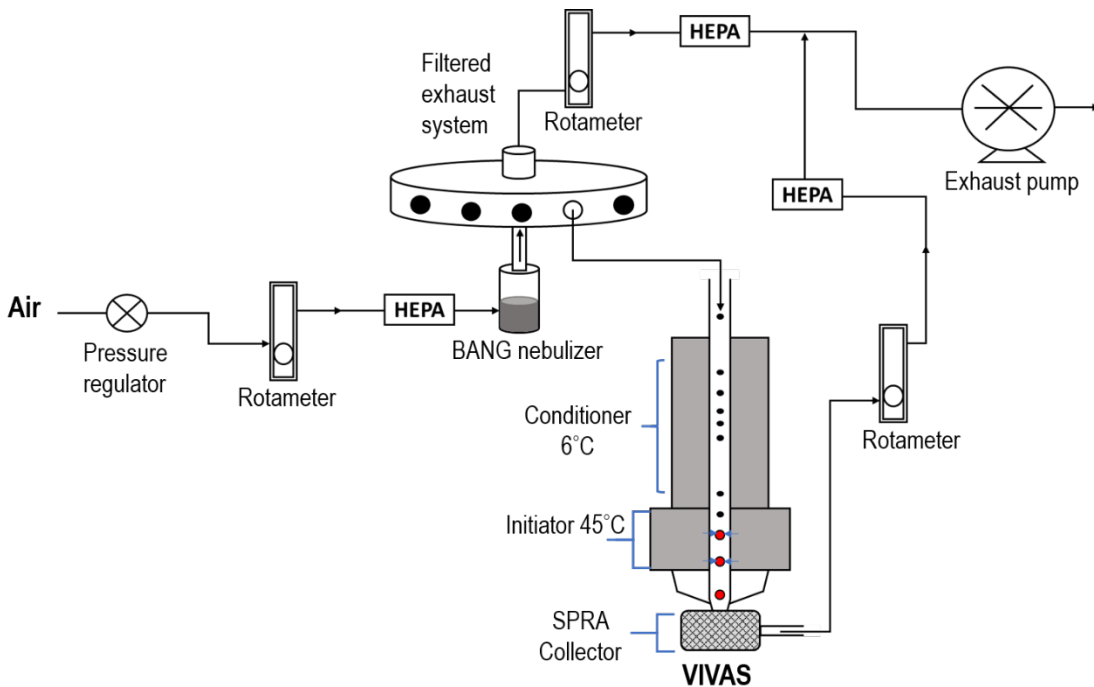
Figure S1. Schematic diagram of the experimental setup for the generation and collection of H1N1 influenza virus aerosols. The H1N1 influenza virus aerosols were generated from a BioAerosol Nebulizing Generator (BANG) with HEPA-filtered room air and then collected with the viable virus aerosol sampler (VIVAS).
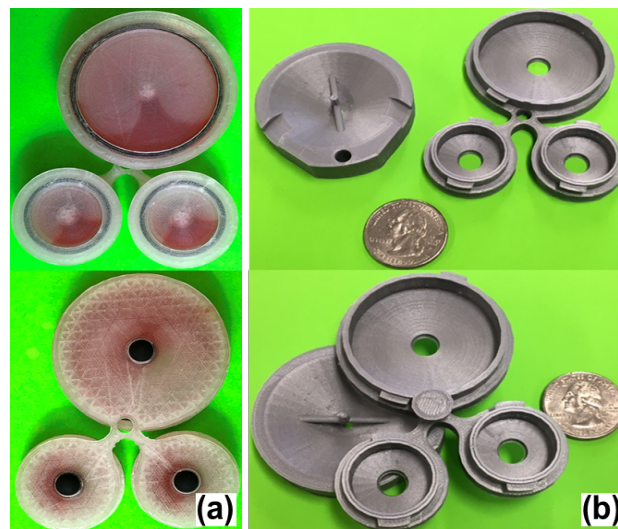

Figure S2. Photographs of the SPAD. (a). Photograph of the SPAD buffer unit containing a red food dye solution, with a top view (top) and a bottom view (bottom). (b). Picture of the components of SPAD with a U.S. quarter (top), and picture of the assembled device with a pin in place (bottom).
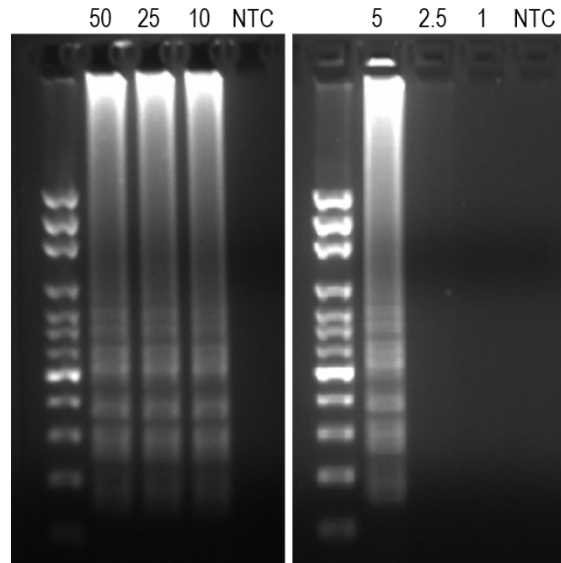
Figure S3. H1N1 influenza virus detection using devices made of glass microfiber pads. The leftest lane of each gel is 100 bp DNA ladder. The virus amount in $TCID_{50}$ is marked above each lane. NTC, no-template control (i.e., negative control).
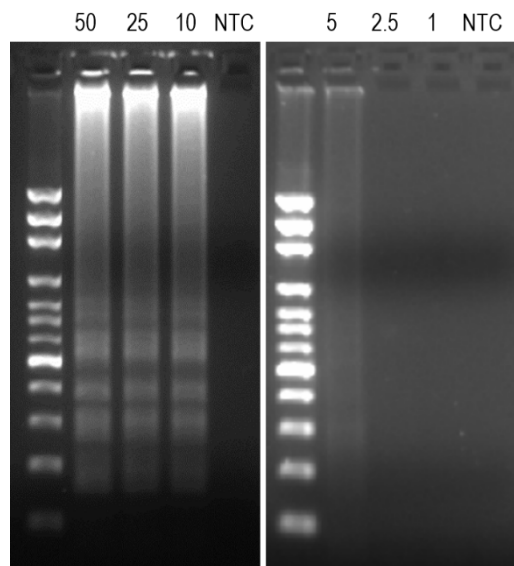

Figure S4. H1N1 influenza virus detection using devices made of FTA® card. The leftest lane of each gel is 100 bp DNA ladder. The virus amount in $TCID_{50}$ is marked above each lane. NTC, no-template control.
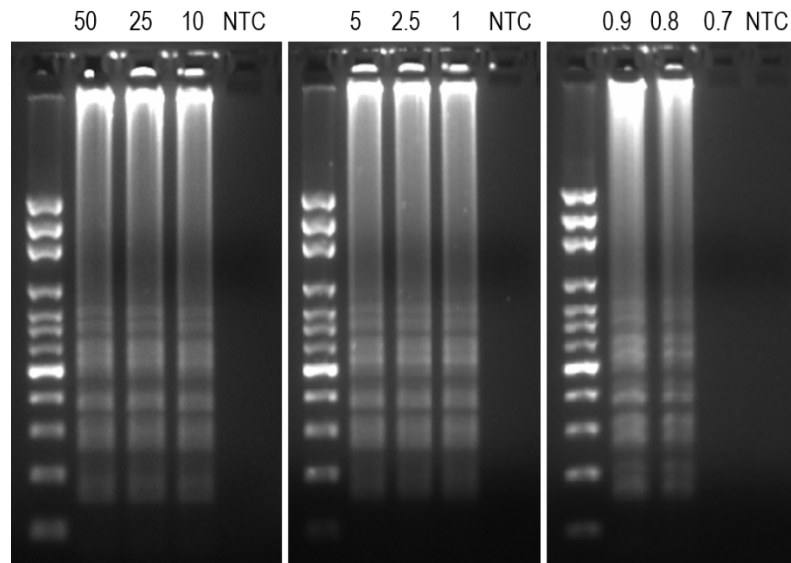
Figure S5. H1N1 influenza virus detection using devices made of chromatography paper. The leftest lane of each gel is 100 bp DNA ladder. The virus amount in $TCID_{50}$ is marked above each lane. NTC, no-template control.

Table S1. Sequences of RT-LAMP primers for H1N1 influenza virus detection.[1]

Primer	Sequence (5' - 3')
F3	ACCTTCTAGAAGACAAGCATAA
B3	TCCTCATAATCGAT
FIP	TGGATTTCCCAGGATCCAGCGGAAACTATGCAAACTAAGAGG
BIP	TCCACAGCAAGCTCATGGTCTCCTGGGTAACACGTTCC
LF	CCAAATGCAATGGGGCTAC
LB	CTACATTGTGGAAACATCTAGTTCAG

Note: FIP stands for Forward Inner Primer; BIP stands for Backward Inner Primer; LF and LB are the forward and backward loop primers.

REFERENCE

1. Nakauchi, M.; Yoshikawa, T.; Nakai, H.; Sugata, K.; Yoshikawa, A.; Asano, Y.; Ihira, M.; Tashiro, M.; Kageyama, T. J. *Med. Virol.* **2011**, 83, 10-15