

October 20, 2009

**The new influenza virus <sup>(\*1)</sup> suppression effect of charged water particles “nanoe”<sup>®</sup> ions<sup>(\*2)</sup> has been verified.**

Panasonic Electric Works Co., Ltd. verified that nano-size charged water particles <sup>(\*3)</sup> which were generated by applying a high voltage, suppressed 99% of the new influenza viruses that adhered to objects placed in a specified space, or so called “adhering viruses”. This study was carried out in collaboration with Obihiro University of Agriculture and Veterinary Medicine Research Center for Animal Hygiene and Food Safety.

It has been reported that viruses expectorated by coughing or sneezing adhered to door knobs, lighting instruments switches, desks, walls, or floors and humans are infected by coming into contact with these viruses.

We believe that adhering viruses constitute one type of contact infection and have verified the suppression effect of nano-size charged water particles on these adhering viruses.

We verified that 99% of the new influenza viruses were suppressed by exposing those that were dropped on the bottom of petri dishes to nano-size charged water particles via a space in a test box with a volume of approximately 45 liters.

We plan to carry out detailed studies, such as examining the relationship between the quantity of nano-size water particles and the experiment space volume.

Nano-size charged water particle generation technologies were developed by Panasonic Electric Works Co., Ltd. in collaboration with Hiroshima Graduate School of Engineering (Higashihiroshima City, Hiroshima Prefecture) in 2003. In 2005, maintenance-free charged water particle generation technologies were developed, by which vapor in the atmosphere was condensed by Peltier elements.

\*1: Swine-origin influenza A/Narita/2009(H1N1)pdm (portioned by the Infectious Disease Surveillance Center)

\*2: Nano-size charged water particles generated by applying a high voltage to water.

\*3: The safety was verified by a third party.

■ **Verification method**

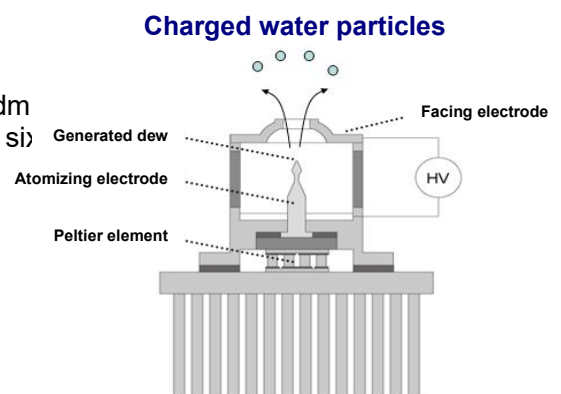
The new influenza viruses that were exposed to charged water particles and those that were not exposed were compared.

■ **Results of verification**

99% of the Swine-origin influenza A/Narita/2009(H1N1)pdm exposed to nano-size water particles were suppressed in six hours.

■ **Principle of generating charged water particles**

Atomizing electrode is cooled by Peltier elements to condense water particles in the atmosphere to generate water. A high voltage is applied across the atomizing electrode and the facing electrode to generate charged water particles of 5 to 20 nanometers (nm).



\* We call the charged water particles “nanoe.”

## ■ Verification data

### [Description of the test]

99% of the new influenza viruses (Swine-origin influenza A/Narita/2009(H1N1)pdm) exposed to nano-size water particles were verified to have been suppressed.

● **Test laboratory:** Obihiro University of Agriculture and Veterinary Medicine Research Center for Animal Hygiene and Food Safety

● **Test period:** August to October 2009

● **Test subject:** New influenza viruses (Swine-origin influenza A/Narita/2009(H1N1)pdm)

● **Test method:**

- Exposed to charged water particles for six hours/Not exposed <control>

- Test box volume: 350 x 350 x 400 mm

- Method of creating virus fluid:

Viruses were proliferated in an embryonated egg's allantoic cavity. The allantoic fluid (concentrated virus solution) was diluted 10 times with ultrapure water and used as an experimental virus fluid.

- Method of exposure to charged water particles:

A charged water particle generator was installed in the box. The experimental virus fluid was exposed to charged water particles via a space for six hours.

- Measurement of the virus titer:

Each virus fluid was collected after it was exposed to charged water particles for six hours, gradually diluted 10 times, and inoculated into embryonated eggs. The titer of the virus (50% tissue culture infectious dose (EID<sub>50</sub>: 50% Egg-infective dose) was calculated based on the hemagglutinating property observed three days later.

### [Results]

99% (\*4) of the new influenza viruses (Swine-origin influenza A/Narita/2009(H1N1)pdm) were suppressed in six hours.

#### [Results]

Test conditions	Titer of virus (*5) log EID <sub>50</sub> /0.1ml
Control (not exposed)	6.5
Charged water particles (exposed)	4.5

\*4: The virus suppression rate is calculated by the following equation.

$$\text{Suppression rate} = (1 - 0.1^{(\text{not exposed} - \text{exposed})}) \times 100\% = (1 - 0.1^{(6.5 - 4.5)}) \times 100\% = 99\%$$

\*5: Quantitative value to express the virus' infectious capacity

## ■ Future development

Panasonic Electric Works Co., Ltd's nano-size-charged water particle generation technologies are expected to be developed for and integrated into various appliances.

We will promote the development of these technologies for personal, business, public, and moving environments to make your personal and business environments more comfortable.

### [Associate research organization]

Kunitoshi Imai, Professor and Haruko Ogawa, Associate Professor

Obihiro University of Agriculture and Veterinary Medicine Research Center for Animal Hygiene and Food Safety