November 2, 2009

For First Time Ever*1, Plasmacluster*2 Ions Shown to Inhibit Infectivity of New-Type H1N1 Influenza Virus in Both Stationary and Airborne Form

Verified in Collaboration with Retroscreen Virology Ltd.*3 of the UK

Sharp Corporation, working in collaboration with Retroscreen Virology Ltd. founded by Professor John S. Oxford of the University of London, UK, has demonstrated for the first time in the world that high-density Plasmacluster ions can inhibit the infectivity of the new-type H1N1 influenza virus, whether it is airborne or stationary.

In the latest experiment, it was shown that Plasmacluster ions inhibit 99.9% of the new-type H1N1 influenza virus in stationary form (drops of the virus placed in a petri dish; concentration of 300,000 ions/cm^3) in 2 hours and 95% of the virus in airborne form (inside a box with a volume of 1 m^3; concentration of 25,000 ions/cm^3) in 40 minutes.

The airborne virus is in either droplet infection form or aerial infection form (droplet infection is when the airborne particles have a diameter of between 5 μm and 10 μm and are infectious; aerial infection is when the airborne particles have a diameter of between 1 μm and 5 μm and are infectious).

Since the year 2000, Sharp has used a “collaborative research approach to product marketing*4”— based on working with academic research organizations around the world—to demonstrate that Plasmacluster technology can remove 28 types of harmful microbes, including MRSA*5. The efficacy of Plasmacluster ions for inhibiting the infectivity of airborne viruses has been proven against the seasonal H1N1 human influenza virus, the H5N1 avian influenza virus, as well as Corona, SARS, Polio, and Coxsackie viruses.

In 2002, the safety of high-density Plasmacluster ions was also confirmed*[6]. In addition, in 2005, Sharp, working together with a number of academic institutions*[7], elucidated the mechanism behind the ability of Plasmacluster ions to destroy the spike-like proteins on the virus surface, which are the triggers for infections.

Sharp will continue to strive to create healthy environments by further advancing Plasmacluster technology and demonstrating its effectiveness.

Comments by Professor John S. Oxford

The new-type H1N1 influenza virus appeared almost out of nowhere and in just three months spread around the world, threatening us all. We can become infected with the virus by breathing it in or by coming into contact with it in a stationary form. Our experiment showed that Plasmacluster ions are effective against both routes of infection. The biggest advantage of this technology is that it can be applied for use against a wide range of viruses; as our experiment showed, it is effective against not just the H5N1 avian influenza virus but against the new-type H1N1 influenza virus as well. I believe that this technology is one of the measures we can take to protect ourselves from the threat of viruses, in addition to wearing facemasks and washing hands.

*1 As of November 2, 2009; according to Sharp.

*2 Plasmacluster and Plasmacluster ions are trademarks of Sharp Corporation.

*3 The OECD (Organisation for Economic Co-operation and Development) Principles of GLP (Good Laboratory Practice) is a set of standards intended to ensure the generation of high-quality and reliable test data through periodic reviews of operational organization and management, test apparatus and materials, study designs, internal audit controls, quality assurance systems, test data, etc., at all test facilities. Re-certification is required every three years.

*4 The “collaborative research approach to product marketing” verifies the effectiveness of a technology based on scientific data developed in collaboration with leading-edge academic research institutions. New products are then brought to market based on the results.

*5 MRSA is an acronym for methicillin-resistant Staphylococcus aureus, a bacterium responsible for difficult-to-treat infections in humans. MRSA typically infects humans with weakened immune systems, for example, patients in hospitals, and its resistance to a large group of antibiotics is a serious problem.

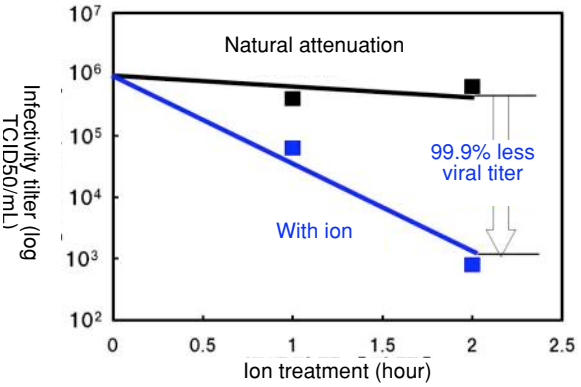
*6 Testing conducted by Mitsubishi Chemical Safety Institute Ltd. (inhalation toxicity, as well as eye and skin irritation/corrosion tests).

*7 Joint research conducted with Professor Gerhard Artmann, of Aachen University of Applied Sciences (2005).

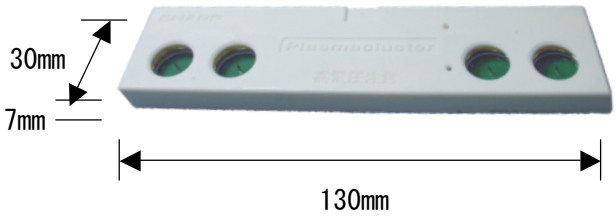
Method of Testing Efficacy Against Stationary New-Type H1N1 Influenza Virus

Using a high-density Plasmacluster ion generator, an ion concentration of approximately 300,000 ions/cm^3 was sprayed on the new-type H1N1 influenza virus in stationary form (drops of the virus placed in a plastic petri dish) for a set period of time.
The virus was collected after being sprayed for 2 hours, and the infectivity (viral infectivity titer*8) was studied using the TCID50 method*9 commonly used in the virology research field. As a result, the infectivity of the virus was 99.9% less than that of virus not treated with Plasmacluster ions and left to natural attenuation.

Change in infectivity titer of stationary new-type H1N1 influenza virus



High-density Plasmacluster ion generator



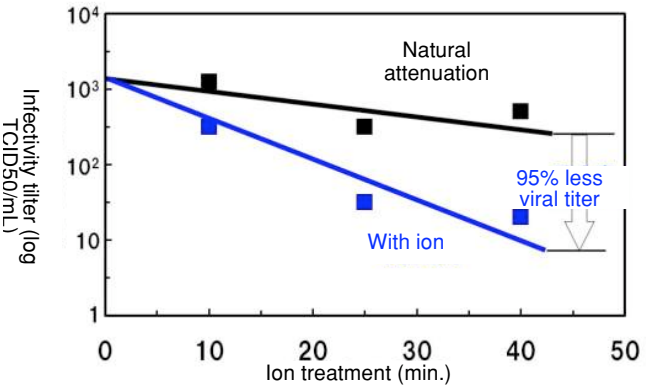
*8 A value indicating the capacity of a virus to infect cells.

*9 50% Tissue Culture Infective Dose method; a test protocol that examines the amount of a virus that will produce pathological change in 50% of cell cultures inoculated with a virus suspension diluted in stepwise increments.

Method of Testing Efficacy Against Airborne New-Type H1N1 Influenza Virus

A Plasmacluster ion generator was placed in a box having a volume of 1m^3. Plasmacluster ions were generated at a concentration of approximately 25,000 ions/cm^3 and the new-type H1N1 influenza virus was sprayed into the box (particle diameter: between 1 μm and 10 μm). After spraying for 40 minutes, the airborne virus in the box was collected and its infectivity was studied using the TCID50 method. As a result, the infectivity of the virus was 95% less than that of virus left to natural attenuation.

Change in infectivity titer of airborne new-type H1N1 influenza virus



Profile of Professor John S. Oxford

- Professor of Virology in the Institute of Cell and Molecular Science at St. Bartholomew's and the Royal London Hospital, Queen Mary's School of Medicine and Dentistry, University of London, UK
- Founder and Scientific Director of Retroscreen Virology Ltd.
- Has chaired numerous international academic conferences and meetings

Retroscreen Virology Ltd.

Retroscreen Virology Ltd. was founded by Professor John Oxford in 1989 to conduct R&D and verification testing related to viruses, drugs, and vaccines, and is well known as one of the leaders of its field. It is certified under GLP (Good Laboratory Practices), an international set of standards for maintaining high levels of reliability and safety in trials involving chemical substances. It is also ISO 9001-certified.

Efficacy of Plasmacluster Ions in Inhibiting Activity of Various Pathogens Confirmed Through Collaborative Research

Target Substance	Species	Testing & Verification Organization	Date of Announcement
Bacteria	*Serratia* bacteria	Harvard School of Public Health (Dr. Melvin W. First, Professor Emeritus), United States	March 2007
	Coliform bacteria (*E. coli*)	Ishikawa Health Service Association, Japan	September 2000
	E. coli, *Staphylococcus* (*aureus*), Candida	Shanghai Municipal Center for Disease Control and Prevention, China	October 2001
	Bacillus subtilis	Kitasato Research Center of Environmental Sciences, Japan	September 2002
		CT&T (Professor Gerhard Artmann, Aachen University of Applied Sciences), Germany	November 2004
	MRSA (methicillin-resistant *Staphylococcus aureus*)	Kitasato Research Center of Environmental Sciences, Japan	September 2002
		Kitasato Institute Medical Center Hospital, Japan	February 2004
	Pseudomonas, Enterococcus, Staphylococcus	University of Lübeck, Germany	February 2002
	Enterococcus, Staphylococcus, Sarcina, Micrococcus	CT&T (Professor Gerhard Artmann, Aachen University of Applied Sciences), Germany	November 2004
Allergens	Mite allergens, pollen	Graduate School of Advanced Sciences of Matter, Hiroshima University, Japan	September 2003
	Mite allergens	Osaka City University Medical School's Department of Biochemistry & Molecular Pathology	July 2009
Fungi	Cladosporium	Ishikawa Health Service Association, Japan	September 2000
		University of Lübeck, Germany (growth-suppressing effect)	February 2002
		CT&T (Professor Gerhard Artmann, Aachen University of Applied Sciences), Germany	November 2004
	Penicillium, Aspergillus	University of Lübeck, Germany (growth-suppressing effect)	February 2002
	Aspergillus, Penicillium (two species), Stachybotrys, Alternaria, Mucorales	CT&T (Professor Gerhard Artmann, Aachen University of Applied Sciences), Germany	November 2004

Viruses	H1N1 human influenza virus	Kitasato Research Center of Environmental Sciences, Japan	September 2002
		Seoul University, Korea	September 2003
		Shanghai Municipal Center for Disease Control and Prevention, China	December 2003
		Kitasato Institute Medical Center Hospital, Japan	February 2004
	H5N1 avian influenza virus	Retroscreen Virology, Ltd., London, UK	May 2005 August 2008
	SARS virus	Retroscreen Virology, Ltd., London, UK	October 2005
	Coxsackie virus	Kitasato Research Center of Environmental Sciences, Japan	September 2002
	Polio virus	Kitasato Research Center of Environmental Sciences, Japan	September 2002
	Corona virus	Kitasato Institute Medical Center Hospital, Japan	July 2004
	New-type H1N1 influenza virus	Retroscreen Virology, Ltd., London, UK	November 2009

Note: Efficacy in inhibiting activity of the airborne target substances noted above was verified by exposing the substances to an ion concentration of at least 3,000 ions/cm^3.

Overview of Plasmacluster Technology