

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

Target Substance	Species	Testing & Verification Organization	Date of Announcement
Bacteria	<i>Serratia</i> bacteria	Harvard School of Public Health (Dr. Melvin W. First, Professor Emeritus), United States	March 2007
	Coliform bacteria ( <i>E. coli</i> )	Ishikawa Health Service Association, Japan	September 2000
	<i>E. coli</i> , <i>Staphylococcus aureus</i> , Candida	Shanghai Municipal Center for Disease Control and Prevention, China	October 2001
	<i>Bacillus subtilis</i>	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 <i>Staphylococcus aureus</i> )	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

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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<sup>3</sup>.

*\*<sup>1</sup> 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<sup>3</sup>) in 2 hours and 95% of the virus in airborne form (inside a box with a volume of 1 m<sup>3</sup>; concentration of 25,000 ions/cm<sup>3</sup>) in 40 minutes.*

*For further details of experiment, please refer to the News release of Sharp Corporation dated 3 Nov 2009.*