IEC | IECEE CB SCHEME

Ref. Certif. No.

JPJQA-9388

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

SYSTEME CEI D'ACCEPTATION MUTUELLE DE CERTIFICATS D'ESSAIS DES EQUIPEMENTS ELECTRIQUES (IECEE) METHODE OC

CB TEST CERTIFICATE
CERTIFICAT D'ESSAI OC

Product *Produit*	Air purifier
Name and address of the applicant *Nom et adresse du demandeur*	Sharp Corporation 3-1-72, KitaKamei-cho, Yao-city, Osaka 581-8585, Japan
Name and address of the manufacturer *Nom et adresse du fabricant*	Same as above.
Name and address of the factory *Nom et adresse de l'usine*	Sharp Appliances (Thailand) Ltd. 64, Moo 5, Bangna-Trad Km. 37, Tambol Bangsamak, Amphur Bangpakong, Chachoengsao, 24180, Thailand
Ratings and principal characteristics *Valeurs nominales et caractéristiques principales*	AC 220-240 V, 50/60 Hz, 75 W, 0.7 A Class II
Trademark (if any) *Marque de fabrique (si elle existe)*	SHARP
Model / Type Ref. *Ref. De type*	FU-A80E-#, FU-A80EA-#, FU-A80SA-#, FU-A80J-#, FU-A80A-# The above models are identical, except for Model name [FU-A80*-#]. Suffix letter (*) shows the destination country. E : Asia, EA : Middle East, SA : Saudi Arabia, J : Australia, A : Hong Kong, Suffix letter (#) shows the color. W : White, S : Silver, N : Gold
Additional information (if necessary) *Informations complémentaires (si nécessaire)*	PUBLICATION / EDITION IEC 60335-1 — 4 th edition with Amend. No. 1 and 2 IEC 60335-2-65 — 2 nd edition with Amend. No. 1
A sample of the product was tested and found to be in conformity with. *Un échantillon de ce produit a été essayé et a été considéré conforme à la*	
As shown in the Test Report Ref. No. which forms part of this Certificate *Comme indiqué dans le Rapport d'essais numéro de référence qui constitue partie de ce Certificat*	KL65110134

This CB Test Certificate is issued by the National Certification Body
Ce Certificat d'essai OC est établi par l'Organisme National de Certification

JQA JAPAN QUALITY ASSURANCE ORGANIZATION
21-25, Kinuta 1-chome, Setagaya-ku, Tokyo 157-8573 Japan

Date: 2011-07-28

Signature: (S. Hiraiwa)

Issued 2003-05

UKcert
Certification & Inspection

Certificate of Compliance

CE

We hereby declare that the technical file of product complied with the requirement of directives 2014/35/EU Low Voltage Directive & 2006/42/EC Machinery Directive

Certificate No.: CE-3215

Name	: **SHARP BUISNESS SYSTEMS INDIA PVT. LTD.**
Address	: **Sharp Business Systems (India) Private Limited, 214-221ansal Tower, 38 Nehru Place, New Delhi - 110019, Delhi, India**
Product	: **Sharp Air Purifier FU-A80E-W**

The Certification body has performed an audit of the above product quality system covering the design, manufacture and final inspection of the certified product. The quality system has been assessed, approved and is subject to continuous surveillance according to Directive 2006/95/EC Low Voltage Directive & 2006/42/EC Machinery Directive

This certificate is issued under the following conditions:

1. It applies only to the quality system maintained in the manufacture of above referenced models and it does not substitute the design or type examination procedures, if requested.
2. The certificate remains valid until the manufacturing conditions or the quality systems are changed.
3. The certificate validity is conditioned by positive results or surveillance audits.

The CE mark as shown above can be used, under the responsibility of the manufacturer, after completion of an EC Declaration of conformity and compliance with all relevant EC Directives. The statement is based on a single evaluation of one sample of above mentioned product. It does not imply an assessment of the whole production.

Validity of this certificate can be verified at www.ukcertifications.co.uk/verify

Date of initial registration	09th May 2015
Date of this certificate	09th May 2015
Certificate expiry	08th May 2016
Recertification due (subject to the company maintaining its system to the required standard)	08th May 2018

Authorised Signatory

UK Certification & Inspection Ltd

Asthma Society of India
(Under KKV Trust)

To whomsoever it may concern

Asthma Society of India - Kisaan Kisani Vikas Trust a registered non-profit based charitable organization Registration No 621. Our Aim is to eradicate asthma disorders from general masses.

As a part of the continuous search to find medication and prevention for such disorders, we have observed that Sharp Plasmacluster Ion Air Purifiers, sold in India, are effective in removal of asthma and allergy triggers like House Dust Mites, Pollen, Influenza Virus, Pet hairs, foul odor.

Virendrakumar Jain
President

165, R.N.T. Marg, Indore -452001, India Phone : 0731-3069109, Fax : 0731-2515007
email : asthma@asthmasocietyofindia.org

ISO 9001
Management System Certificate

Certificate Number : JQA-QM4441

Organization :

SHARP APPLIANCES (THAILAND) LTD.

64 MOO 5, BANGNA-TRAD KM. 37, TAMBOL BANGSAMUK, AMPHUR BANGPAKONG, CHACHOENGSAO, PROVINCE 24180 THAILAND

JQA certifies that the above organization operates the Quality Management System, within the scope of the Appendix attached, which has been assessed and found to comply with the requirements of;

ISO 9001 :2008 / JIS Q 9001 :2008

Registration Date : March 3, 2000
Last Renewal Date : March 26, 2013

Expiry Date : March 25, 2016

Feel free to contact JQA for the validity of this certificate.

O. Morimoto

OSAMU MORIMOTO
PRESIDENT

JAPAN QUALITY ASSURANCE ORGANIZATION

To be used in conjunction with attached Appendix.

TOKYO, JAPAN

JQA

10.05 D7501076E

ISO 9001
Appendix

Certificate Number : JQA-QM4441

Organization :

SHARP APPLIANCES (THAILAND) LTD.

Scope of Registration:

- THE DESIGN / DEVELOPMENT, MANUFACTURE AND SUPPORT FOR SERVICING (SUPPLY OF SPARE PARTS) OF MICROWAVE OVENS, REFRIGERATORS AND AIR CONDITIONERS.
- THE DESIGN VERIFICATION, DESIGN VALIDATION, DESIGN CHANGE, MANUFACTURE AND SUPPORT FOR SERVICING (SUPPLY OF SPARE PARTS) OF HUMIDIFIERS, WATER OVEN, ION GENERATOR, AIR PURIFIER, WASHING MACHINE AND RICE COOKER.

Registration Date : March 3, 2000
Last Renewal Date : March 26, 2013

Expiry Date : March 25, 2016

Feel free to contact JQA for the validity of this certificate.

OSAMU MORIMOTO
PRESIDENT

JAPAN QUALITY ASSURANCE ORGANIZATION

This Appendix is an integral part of the Certificate and should only be used in conjunction with the Certificate.

JQA

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.

22 Research Institutes That Provided Data for Sharp's Academic Marketing

Target Substance	Testing & Verification Organization
Viruses	Kitasato Research Center of Environmental Sciences, Japan
	Seoul National University, Korea
	Shanghai Municipal Center for Disease Control and Prevention, China
	Kitasato Institute Medical Center Hospital, Japan
	Retroscreen Virology, Ltd., UK
	Shokukanken Inc., Japan
	Hanoi College of Technology, Vietnam National University, Vietnam
	Pasteur Institute, Ho Chi Minh City, Vietnam
	Public Health Research Foundation, Graduate School of Medicine, Tokyo University
Allergens	Graduate School of Advanced Sciences of Matter, Hiroshima University, Japan
	Department of Biochemistry and Molecular Pathology, Graduate School of Medicine, Osaka City University, Japan
	Soiken Inc., Japan
Mold fungi	Ishikawa Health Service Association, Japan
	University of Lübeck, Germany
	Professor Gerhard Artmann, Aachen University of Applied Sciences, Germany
	Japan Food Research Laboratories, Japan
Bacteria	Ishikawa Health Service Association, Japan
	Shanghai Municipal Center for Disease Control and Prevention, China
	Kitasato Research Center of Environmental Sciences, Japan
	Kitasato Institute Medical Center Hospital, Japan
	Dr. Melvin W. First, Professor Emeritus, Harvard School of Public Health, US
	Animal Clinical Research Foundation, Japan
	University of Lübeck, Germany
	Professor Gerhard Artmann, Aachen University of Applied Sciences, Germany
	Japan Food Research Laboratories, Japan
	Shokukanken Inc., Japan
Odors, pet smells	Boken Quality Evaluation Institute, Japan
	Animal Clinical Research Foundation, Japan
Skin beautifying effects	Soiken Inc., Japan
Hair beautifying effects	Saticine Medical Co., Ltd.
	C.T.C Japan Ltd.
<Efficacy Analysis>	
Inhibitory effects on viruses, mold fungi and bacteria	Professor Gerhard Artmann, Aachen University of Applied Sciences, Germany
Inhibitory effects on allergens	Graduate School of Advanced Sciences of Matter, Hiroshima University, Japan
Skin moisturizing (water molecule coating) effect	Research Institute of Electrical Communication, Tohoku University, Japan

Note: In collaboration with 22 research organizations, Sharp has proven the efficacy of Plasmacluster Ions against 29 types of harmful substances (viruses, allergens, mold fungi, and bacteria) as well as their efficacy and working mechanism in neutralizing four types of odors and in beautifying skin.

Allergy UK

SEAL OF APPROVAL CERTIFICATE

This is to certify that

Sharp Electronics UK Ltd

Has been awarded the British Allergy Foundation Seal of Approval for reduction in exposure to House Dust Mite and Pollen for their product

Plasmacluster Air Purifier

Model No's without Humidifying Function	Countries
KC930EK	UK
FUW53E, FUW43E, FUW28E, FUY30EU	EU & Russia
FPP30U, FPA80U, FPA60U, FPA40U, FPA40C, FPA28U, FPA28C	North America
FUA80SA, FUA80EA, FUY30EU, FUZ31E, FUY30SA	Middle East & Africa
FUW53J, FUW28J, FUA80J, FUY30J	Australia & New Zealand
FUZ35TA, FUY50K, FUA80E, FUA80A, FUA80TA, FUA80T, FUA80Y, FUW50A FUW40A, FUW25A, FUW53E, FUW53TA, FUW43E, FUW43TA, FUW43T, FUD40T FPD40T, FUD40A, FPD40A, FUD50A, FPD50TA, FPD50E, FPD50Y, FUD80T, FUD50T FUE30A, FPE50E, FPE50TA, FPE50Y, FPF30L, FPF30E, FPF30TA, FPF30Y, FPF30SA FPF40L, FPF40E, FPF40TA, FPF40Y, FUF40A, FUF30A, FUY30E, FUY30A FUY30K FUY30TA, FUY30T, FUY30EV, FUZ31E, FUZ31Y, FUZ31T, FUY28E, FUY28TA, FUY28Y FUY28EP, FUA28E, FUA28TA, FUA28Y, FUA28EV, FUD30T	Asia
FUA420S, FUAW240SR, FUAW240SW, FUCD30, FUWD30, FUBD30, FUCD20, FUWD20 FUBD20, FUWE10, FUBE10, FUCE10, FUWF20, FUBF20, FUY180SW, FUGB10	China
FUA80, FUA51, FUB51, FU-D80, FU-D51, CV-DF100, FUE80, FUE51, CV-EF120, FUA30 FU30P1, FUB30, FU-D30, FUE30	Japan

(Appropriate Room Sizes to Be Clearly Marked On External Packaging and Instruction Manual)

Signed: _____

Lindsey McManus, Deputy Chief Executive
Licence No: 323
Valid until: 8th August 2016

SEAL OF APPROVAL CERTIFICATE

This is to certify that

Sharp Electronics UK Ltd

Has been awarded the British Allergy Foundation Seal of Approval for reduction in exposure to House Dust Mite and Pollen for their product

Plasmacluster Air Purifier

Model No's with Humidifying Function	Countries
KC860EK, KC850EK, KC930EK	UK
KC860E, KC850E, KC840E, KC-A61R, KC-A51R, KC-A41R, KCA60EU, KCA50EU, KCA40EU KCD61R, KCD51R, KCD41R, KC930EU	EU & Russia
KC860U, KC850U, KC830U	North America
KC860E, KC860SA, KC850E, KC850SA, KC840E, KC840SA, KCA60SA, KCA60EA, KCA50SA KCA50EA, KCA40SA, KCA40EA, KIA60SA, KC930EU, KC930SA	Middle East & Africa
KCA60J, KCA50J, KCA40J	Australia & New Zealand
KC930TA, KC860E, KC860A, KC860K, KC860TA, KC860T, KC860Y, KC850E, KC850A, KC850K KC850TA, KC850T, KC850Y, KC840E, KC840A, KC840K, KC840TA, KC840T, KC840Y, KC960K, KC950K, KC940K, KCA60E, KCA60TA, KCA60T, KCA60Y, KCA50E, KCA50TA, KCA50T, KCA50Y KCA40E, KCA40TA, KCA40T, KCA40Y, KCZ200A, KCZ280A, KCZ380A, KIA60E, KIA60Y, KIA60TA KIAB60, KCD60TA, KCD60E, KCD60Y, KCD50TA, KCD40TA, KCD40E, KCD40Y, KCJD70T KCJD60T, KCJD50T, KCA60K, KCA40K, KCAE60, KCAE30, KCAE20, KC930E, KC930A, KC930K KC930EV, KC930Y, KCAD10	Asia
KCW380SW, KCW280SW, KCW200SW, KCC150SW, KCC100SW, KCC100SC, KCC70SW KCZ380SW, KCZ280SW, KCZ200SW, KCW380SWW, KIBB60, KCWB6, KCWB3, KCWB2 KIBC608, KCBB60, KCBB30, KCBB20, KCCD60, KCCD30, KCCD20, KIBC608, KCBD60, KCBD30 KCBD20, KCWE30, KCWE20, KCWF50, KCWF20, KCWE61, KCWE31, KCWE21, KICE60, KCCE50 KCWE50, KIGF707, KIGF70, KIGF60, KIGF61, KIBB608, KCCE60, KCCG50, KIWF706 KIWF606, KCY180SW, KCGD10, KCDD10	China
KCM400, KIAX80, KIAX70, KCA70, KCA50, KC700Y4, KC70E8, KC500Y4, KC50E8, KIBX85 KIBX70, KIBX50, KCB70, KCB50, KC700Y5, KC70E9, KC500Y5, KC50E9, KIDX85, KIDX70 KIDX50, KCD70, KCD50, KCD40, KI85Y40, KC700Y6, KC70E1, KC500Y6, KC50E1, KIEX100 KIEX75, KIEX55, KCE70, KCE50, KC700Y7, KC70E2, KC500Y7, KC50E2, KC30K1, KCA40, KC40P1 KC30T1, KCB40, KC30T2, KC30T3, KCE40, KC30T4, KC30K2, KC70TH1, KC50TH1	Japan

(Appropriate Room Sizes to Be Clearly Marked On External Packaging and Instruction Manual)

Signed: _____

Lindsey McManus, Deputy Chief Executive
Licence No: 325
Valid until: 8th August 2016

Indoor Suspended Allergen Inactivation Technology Using Cluster Ions Generated by Discharge Plasma

Kazuo Nishikawa* Hideo Nojima*

Abstract

Mite allergen deactivation technology has been developed using cluster ions generatedby discharge plasma at atmospheric pressure. The effect of ions on airborne mite allergenshas been evaluated by ELISA and ELISA inhibition methods. The allergy reactivity of miteallergens has been reduced with exposure to ions generated by the present device, andit has been confirmed that these ions can deactivate airborne mite allergens. Furthermore,efficacy tests of these ions on airborne mite dust allergens floating indoors have beenperformed, and significant deactivation of these allergens due to the effect of ions hasbeen confirmed.

Preface

Mite allergies, hay fever, food allergies and atopic rashes receive widespread coverage in the media today.[1,2] The prevalence of these allergies is increasing every year in the developed world, and a survey by Japan's Ministry of Health, Labour and Welfare found that 1 in 3 Japanese have allergies. Caused by factors such as living environments, changing dietary habits and increasing stress, allergies are some of the diseases of civilization' that afflict the modern world.

Previous Sharp research work has shown that positively and negatively charged cluster ions generated by discharge plasma at atmospheric pressure can be used to inactivate suspended airborne bacteria, fungi, and viruses, and to remove toxic substances from tobacco smoke.[3,4,5]

The research described in this paper examined mite allergens (the major indoor allergens) and cluster ions generated by a discharge plasma created by ion generators at atmospheric pressure. We conducted tests to verify the effectiveness of these ions in inactivating these allergens, and found that the interaction of positive and negative cluster ions can significantly inactivate airborne mite allergens and inhibit their allergic reactivity. We also verified their effectiveness of cluster ions in inactivating suspended mite dust in indoor environments. The effects we verified have been successfully applied to develop new-concept air purification technology. This paper reports on the effectiveness of positively and negatively charged cluster ions generated by ion generators in inactivating airborne mite allergens.

1. Experimental apparatus and methodology

1.1 Ion generators[4]

Figure 1 is a photo showing the type of ion generator used in the tests. Electrodes are formed

*A1241 Project Team member

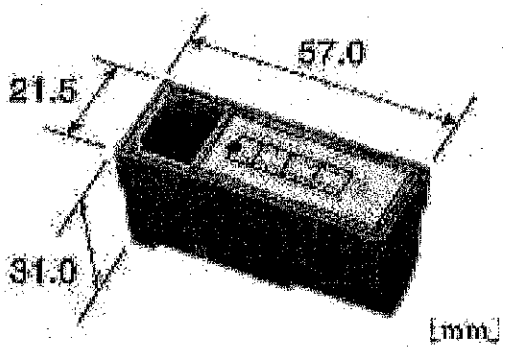

Fig. 1 Photograph of the ion generation device.

on the surface of a flat-plate dielectric, applying a high-voltage AC current to create a plasma discharge state on the surface. The discharge plasma ionizes and dissociates the molecules in the air to generate positively and negatively charged ions. For the tests described in this paper, the generated ions were diffused throughout the space by an air blower. The generated ion species were positively charged cluster ions of $H_3O^+(H_2O)_m$ (where m is an integer) and negatively charged cluster ions of $O_2^-(H_2O)_n$ (where n is an integer).

1.2 Specimen preparation method

We placed 1 g of adult European house mites (Dermatophagoides pteronyssinus; Der p) on 5 g of a food source (powdered Ebios beer yeast mixed in a 1:1 weight ratio with Lab. Animal Diet MF' used for mice, rats and hamsters), and allowed them to propagate for 2 months in an environment of 25°C and 75% RH. We then heated the specimen in a microwave oven for 2 minutes at 500 W, allowed it to air-dry overnight, then finely pulverized it to a uniform consistency in a mortar to create mite dust. The crude mite antigen we used (Dfb) was refined from this mite dust.

1.3 Crude mite antigen inactivation test method

Figure 2 shows the test apparatus. We used an acrylic cylindrical container of 50 cm in height and 14 cm in diameter fitted with 4 ion generators inside it, and a top-mounted nebulizer for spraying allergens. During the experiment, we filled the apparatus with positive and negative ions in an average concentration of 100,000 ions/cm^3, and sprayed a mist of crude mite antigen (with a protein concentration of 200 ng/ml) from the nebulizer (Omron model NE-C10) on top of the apparatus. After the crude antigen had been suspended in the ion space for about 90 seconds, we collected it with the collection container at the bottom of the apparatus.

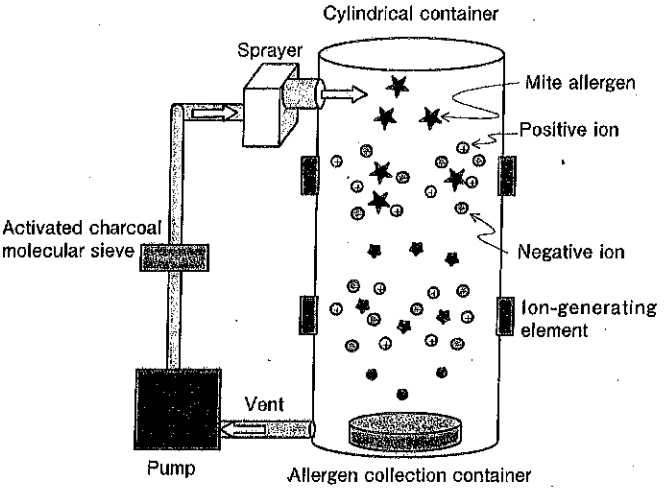

Fig. 2 A mite allergen atomization and collection system.

We then carried out an ELISA (enzyme-linked immunosorbent assay) to assess the change in the allergic reactivity of the collected crude mite antigen (Dfb) to anti-Der f 1 and anti-Der f 2 mouse antibodies (manufactured by Seikagaku Corporation), and to serum IgE antibodies from mite allergy sufferers. To quantitatively assess the allergic reactivity of crude mite antigens exposed to ions, we used the ELISA inhibition method to measure the allergen inactivation rate of the crude mite antigen.

1.4 Mite dust inactivation test method

Figure 3 shows the test apparatus. We installed ion generators and an air blower for ion agitation in a cubic acrylic chamber of 1 m^3 in volume (1×1×1 m). We suspended 0.5 g of mite dust in the chamber, exposed it to ions for 15 minutes, then used a suction pump to evacuate the air from the chamber and pass it through a membrane filter to collect the mite dust. We extracted the proteins from the mite dust exposed to ions (the test group) and the mite dust not exposed to ions (the control group), and measured the protein quantity of each group by the Folin-Lowry method to quantitatively assess the difference between each group's allergic

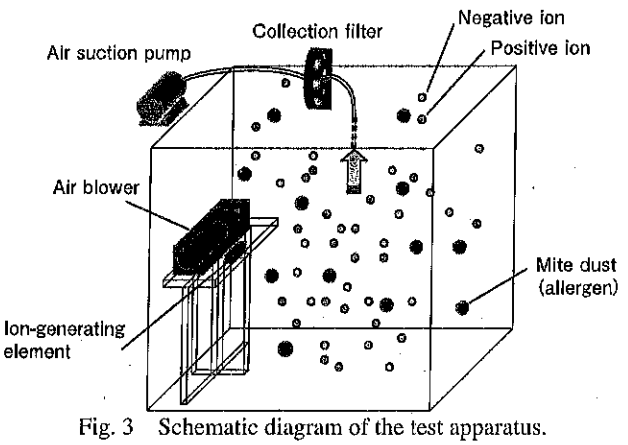

Fig. 3 Schematic diagram of the test apparatus.

reactivity to serum IgE antibodies from mite allergy sufferers. After making the protein concentrations of each group uniform, we used the ELISA inhibition method to measure the allergen inactivation rate of the mite dust of each group. We then allowed sensitized mouse mast cells to react with allergens extracted from the mite dust exposed to ions, and observed the mast cell response.

2. Experimental results and observations

2.1 Change in allergic reactivity of Der f 1 and Der f 2 (major component antigens of the crude mite antigen)

We carried out an ELISA to assess the change that ion exposure created in the allergic reactivity of Der f 1 and Der f 2 (the major component antigens of the crude mite antigen) to their monoclonal antibodies. Figure 4 shows the results. We exposed the crude mite antigen to an average ion concentration of 100,000 ions/cm^3 for 90 seconds.

We measured the allergic reactivity of the crude mite antigen to the anti-Der f 1 and anti-Der f 2 monoclonal antibodies when the crude mite antigen was exposed to ions (test group) and not exposed (control group). We carried out the test 3 times and used significance testing to obtain a 95% confidence interval by statistical analysis. Our results verify that the allergic reactivity of both Der f 1 and Der f 2 (the major component antigens of the crude mite antigen) to their monoclonal antibodies was significantly reduced by ion exposure.

2.2 Change in crude mite antigen allergic reactivity

We carried out an ELISA to assess the allergic reactivity of the crude mite antigen to serum IgE antibodies from mite allergy sufferers, when the crude mite antigen was exposed to ions (test group) and not exposed (control group). Figure 5 shows the results. We tested the significance of the

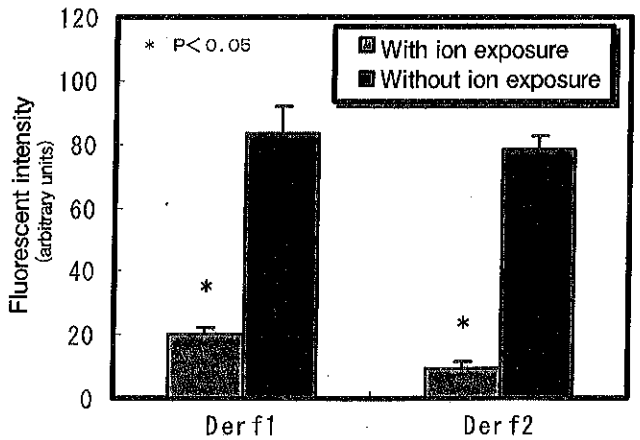

Fig. 4 Allergy reaction of principal mite allergens Der f 1, Der f 2 with exposure to ions.

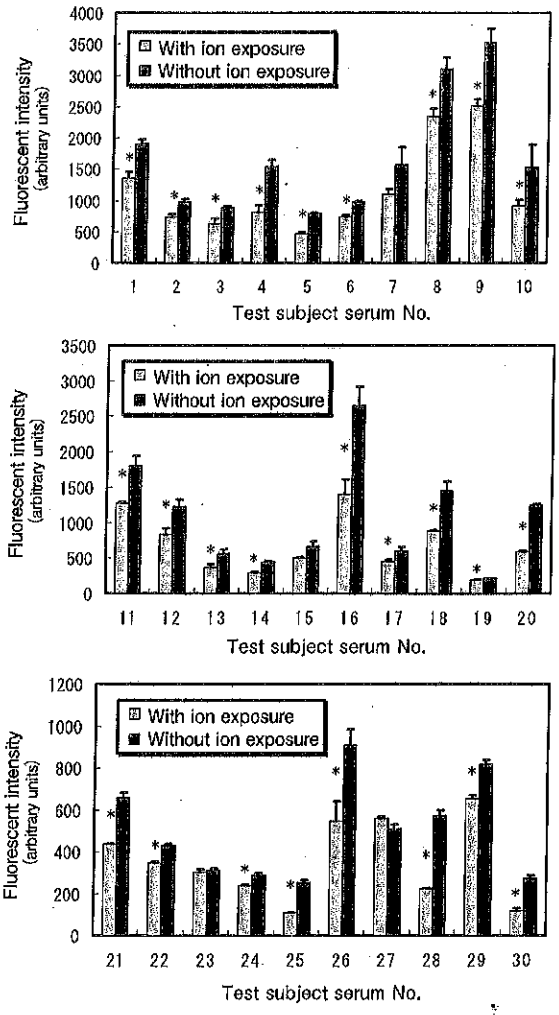

Fig. 5 Allergy reaction of refined mite allergens with exposure to ions.

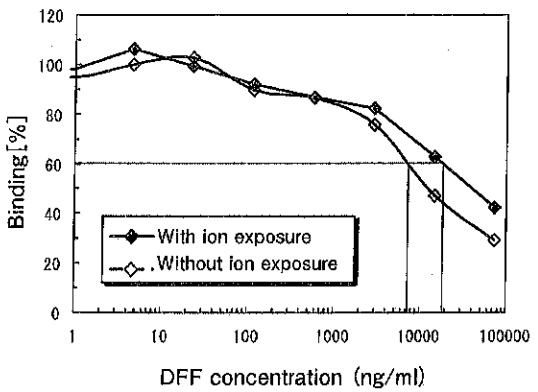

Fig. 6 Deactivation effect of refined mite allergens with exposure to 100,000 counts/cm^3 ions for 90sec.

change 3 times and used significance testing to obtain a 95% confidence interval by statistical analysis.

We measured allergic reactivity to the serum IgE antibodies of 30 mite allergy sufferers, and verified that ion exposure significantly reduced the allergic reactivity of 26 of the 30 sufferers. This finding indicates that allergic reactions were significantly

reduced for 87% of mite allergy sufferers. Reactivity to IgE antibodies fell by 80% or more for 4 test subjects, by 70 to 80% for 2 subjects, by 60 to 70% for 5 subjects, by 50 to 60% for 6 subjects, by 40 to 50% for 3 subjects, and by 30 to 40% for 4 subjects.

We used the ELISA inhibition method to measure the allergen inactivation rate by quantitative measurement of the reactivity of crude mite antigen to serum IgE antibodies from mite allergy sufferers, when the crude mite antigen was exposed to ions (test group) and not exposed (control group). The allergen inactivation rate of the crude mite antigen was 68% when exposed to

2.3 Change in mite dust allergic reactivity

We used the ELISA inhibition method to assess allergen inactivation rates by quantitative measurement of the reactivity of mite dust to serum IgE antibodies from mite allergy sufferers, when the mite dust was exposed to ions (test group) and not exposed (control group). In the test group, mite dust exposed to ions inhibited mite dust not exposed to ions from bonding with serum IgE antibodies from mite allergy sufferers. In the control group, suspended mite dust not exposed to ions inhibited bonding.

In the test group, we suspended mite dust for 15

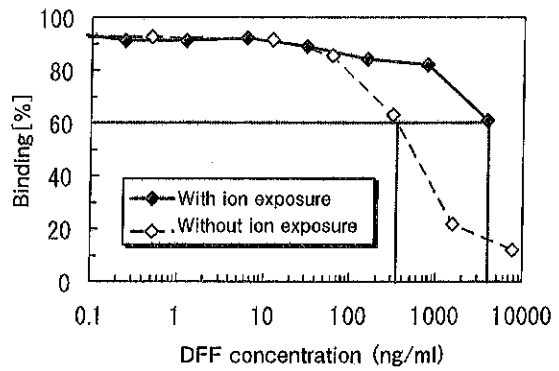

Fig. 7 Deactivation effect of the mite dust allergens with exposure to 10,000 counts/cm³ ions for 15 min.

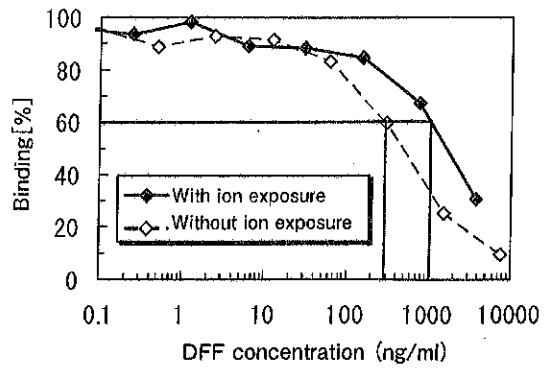

Fig. 8 Deactivation effect of the mite dust allergens with exposure to 3,000 counts/cm³ ions for 15 min.

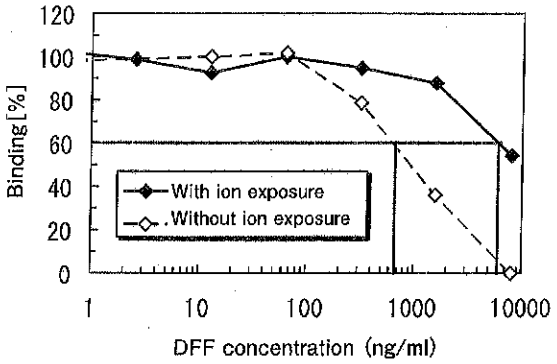

Fig. 9 Deactivation effect of the mite dust allergens with exposure to 2,000 counts/cm³ ions for 60 min.

minutes in a space with an average ion concentration of 10,000 ions/cm³, then collected it. In the control group, we suspended mite dust in a space not exposed to ions for 15 minutes, then collected it. We compared the antigenic properties of the two groups of mite dust at an inhibition rate of 60%. While 4,000 ng of the mite dust exposed to ions (test group) was required for a 60% inhibition rate, only 360 ng of mite dust not exposed (control group) was required for this rate. In other words, the test group mite dust exhibited the same inhibition rate at about 11.1 times the quantity of the control group, so the allergen inactivation rate of test group mite dust was 91% (Figure 7).

Using the same methodology, we tested the mite allergen inactivation effectiveness when mite dust was suspended for 15 minutes in spaces with average ion concentrations of 3,000 ions/cm³ and 2,000 ions/cm³. The allergen inactivation rates in these cases were 74% (Figure 8) and 23% respectively. When mite dust was suspended in a space with an average ion concentration of 2,000 ions/cm³ for 60 minutes, the mite allergen inactivation rate was 89% (Figure 9). These findings indicate that the allergen inactivation rate increases in proportion to ion concentration and length of ion exposure time.

Figure 10 illustrates the mechanism by which allergens cause allergic reactions. The human body contains cells of 10 to 30 μm in diameter called mast cells, located on the epithelium of mucus membranes and in tissues. Mast cells control the body's immune functions, and produce irritants such as histamines that cause allergies. In allergy sufferers, IgE antibodies stick to the surface of mast cells, causing a discharge of histamines and other irritants from them when allergens bond with the IgE antibodies. These irritants irritate the mucous membranes in the throat and nose causing allergic reactions such as coughing, sneezing and postnasal drip.

Figure 11 shows photos of mast cells in which IgE antibody bonding had previously occurred. Photo

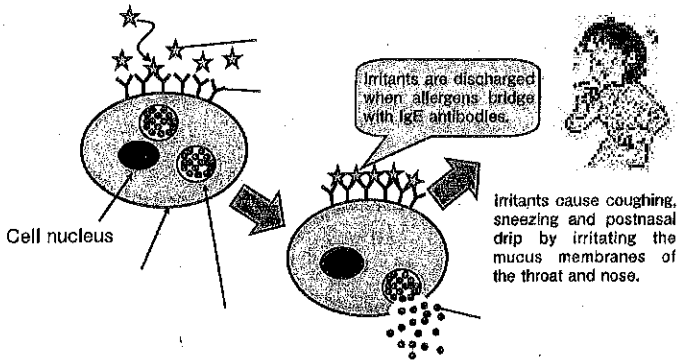

Fig. 10 Mechanism of allergy disease attack by allergens.

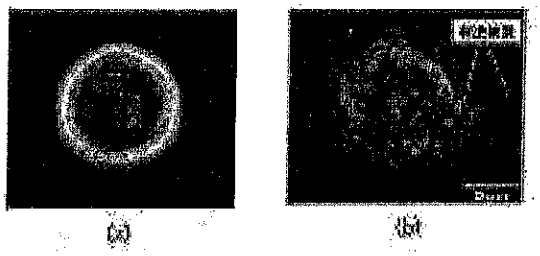

Fig. 11 Photograph of the mast cell reacted with mite allergens (a) with ions, (b) without ions.

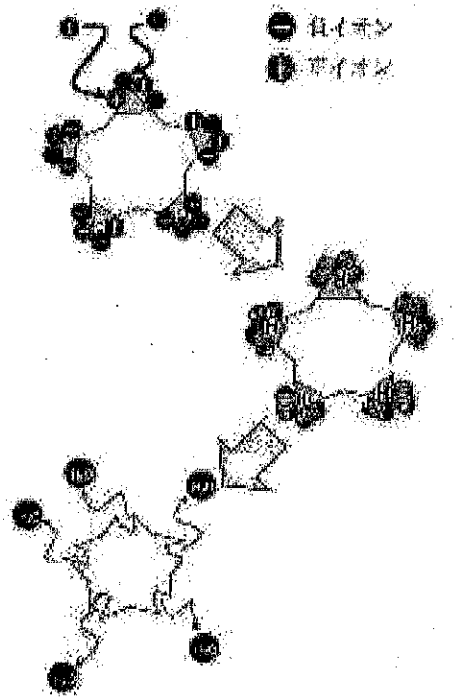

Fig. 12 Model for deactivation of aller gens.

(a) shows the mast cell reaction to mite allergens exposed to Plasmacluster Ions. Photo (b) shows the reaction to mite allergens not exposed to Plasmacluster Ions.

Since the mite allergens exposed to Plasmacluster Ions became inactivated, they were unable to bond with the IgE antibodies on mast cell surfaces, and no irritant discharge was observed. In contrast, mite allergens not exposed to Plasmacluster Ions bonded with the IgE antibodies on mast cell surfaces, and irritant discharge from mast cells was observed. These observations of actual cells provided further verification of the effectiveness of Plasmacluster Ions in allergen inactivation.

2.4 Model for allergen inactivation by cluster ions

As described, we verified the effectiveness of positively and negatively charged cluster ions generated by ion generators, in inactivating mite allergens. Figure 12 illustrates the model by which positive and negative cluster ions inactivate suspended allergens. Cluster ions collide with, and surround airborne allergens. Positively charged $H_3O^+(H_2O)_m$ cluster ions (where m is an integer) and negatively charged $O_2^-(H_2O)_n$ cluster ions (where n is an integer) react on the surface of the allergen to generate highly reactive species of active radicals. These active radicals may react with the allergen's proteins, causing them to degenerate. In mite allergens, cluster ions may cause degeneration of sites for bonding with IgE antibodies, eliminating the allergen's ability to bond with the antibodies. IgE antibody bonding is therefore disabled, inactivating the allergens.

Conclusion

We examined the mite allergen inactivation properties of positive and negative ions generated by ion generators, and found the following results:

(1) We verified that cluster ions significantly reduce the reactivity of both Der f 1 and Der f 2 (major component antigens of the crude mite antigen) to antibodies.

(2) We verified that cluster ions significantly reduce the allergic reactivity of crude mite antigen to serum IgE antibodies from mite allergy sufferers. We verified that ion exposure significantly reduced the allergic reactivity to serum IgE antibodies of 26 out of 30 sufferers, with a 95% confidence interval.

(3) We verified that cluster ions can inactivate the allergens of mite dust suspended in an indoor environment, and actually observed allergic inhibition in mast cells

This research verified the effectiveness of positive and negative cluster ions in inactivating mite allergens (the main cause of indoor allergies), and the allergens in mite dust suspended in indoor environments. These results indicate that Plasmacluster Ions may be highly effective in inhibiting and reducing mite

allergies. This technology has been successfully applied to products such as air conditioners and air purifiers, and can be expected in a wider range of applications in future..

Acknowledgements

For their help with our analysis and assessments of the allergic reactivity of allergens, we would like to thank Professor Kazuhisa Ono, Assistant Professor Seiko Shigeta, and Norihiko Fukuoka, of the Department of Molecular Biotechnology of Hiroshima University's Graduate School of Advanced Sciences of Matter.

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(Received: June 16, 2004)

VOLUME 14
NUMBER 11
NOVEMBER 2010
SUPPLEMENT 2

PAGES S1–S387
ISSN 1027-3719

The International Journal of Tuberculosis and Lung Disease

The Official Journal of the International Union Against Tuberculosis and Lung Disease

ABSTRACT BOOK

41st World Conference on Lung Health of the International Union Against Tuberculosis and Lung Disease (The Union)

BERLIN · GERMANY
11–15 NOVEMBER 2010

PS-101205-13 Monitoring anti-tuberculosis drug induced chemical changes in *M. tuberculosis* by SERS

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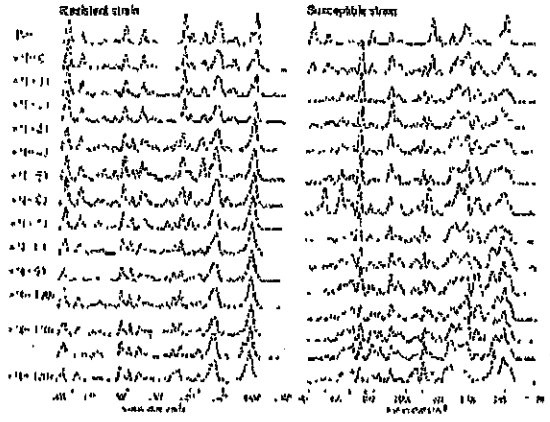
Aim: To monitor antibiotic-induced chemical changes of *Mycobacterium tuberculosis* by surface-enhanced Raman spectroscopy (SERS) and to demonstrate the feasibility of using such a high-speed nondestructive optical technique for detecting the differences between drug-susceptible and drug-resistant strains.
Methods: Substrates with extremely large and uniform enhancing power are exploited for measuring the vibrational spectra of molecules on the cell-wall of *M. tuberculosis* by SERS. Thanks to the sensitivity of the method, the spectrum of single or few bacteria can be recorded in a few seconds, allowing real time monitoring of chemical changes on bacteria after being exposed to antibiotics. Based on the characteristic differences in the changes, drug susceptibility of *M. tuberculosis* can be identified. Pan-susceptible and mono-drug (isoniazid, rifampicin, ethambutol, or pyrazinamide) resistant *M. tuberculosis* were analyzed.
Results: The SERS spectra of a pan-susceptible *M. tuberculosis* strain exhibits dramatic changes in a few tens of minute after treating with isoniazid (INH), as shown in the following example (Figure). In contrast, the SERS spectra of an INH-resistant strain show relatively minor and stable changes. Two robust peaks (400 cm-1 and 525 cm-1) for INH resistant, while one (725 cm-1) for INH susceptible *M. tuberculosis* were identified.



Conclusion: The SERS-based detection platform with single bacterium sensitivity opens unprecedented opportunities for drug susceptibility testing of *M. tuberculosis* and assessing the efficacy of new drugs for tuberculosis.

PS-101291-13 SELDI-TOF-MS for detecting serum protein biomarkers of smoking in North Chinese Han males

D Xiao, S F Chu, C Wang. Beijing Institute of Respiratory Medicine, WHO Collaborating Center for Tobacco or Health, Beijing, China. e-mail: xiaodan7299@hotmail.com

Objectives: To discover the potential biomarkers and establish a diagnostic pattern for smoking by using proteomic technology.
Methods: Serum proteomic spectra were generated by surface-enhanced laser desorption ionization time of flight mass spectrometry (SELDI-TOF-MS). A set of spectra, derived from analyzing serum from 40 smokers and 40 age- and sex-matched healthy non-smokers, was used to develop a decision tree model with a machine learning algorithm called decision boosting. A blinded testing set, including 10 smokers and 10 healthy non-smokers, was used to determine the accuracy of the model.
Results: The diagnostic pattern with a panel of three potential protein biomarkers of mass-to-charge (m/z) 3159.13, 7561.03, 9407.32 could accurately recognize 38 of 40 smokers and 39 of 40 non-smokers. Validation on the blinded testing set indicated that the decision tree could differentiate 8 of 10 smokers and 10 of 10 non-smokers.
Conclusions: The preliminary data suggested a potential application of SELDI-TOF-MS as an effective technology to profile serum proteome of smoking, and with pattern analysis, a diagnostic model comprising three potential biomarkers was indicated to differentiate smokers and non-smokers rapidly and precisely.

PS-101364-13 Efficiency of Plasmacluster ion in killing of *Mycobacterium tuberculosis* on culture media ***

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Setting: Prevention of tuberculosis transmission in environment is control ventilation, ultraviolet germicidal irradiation and filtration air with high efficiency particulate air filter. New innovation of Plasmacluster ion generation for air cleaning has been proved to be effective in killing pathogenic viruses, clinically important bacteria and fungus. There was no any study done for *Mycobacterium tuberculosis*.
Objective: To study the efficiency and exposure time of Plasmacluster ions in killing standard strain of

M. tuberculosis (H37Rv) and 50 isolated *M. tuberculosis* strains from tuberculosis patients on culture media in laboratory.
Method: Prepare suspension of bacteria with McFarland No.1 and diluted to 1:10000. Inoculate 0.1 ml. suspension on Middlebook 7H10 media for 5 media. Incubate media in incubator at 37°C for 48 hours to check contamination. Expose 4 media at a distance of 1 foot from Plasmaclustrer Ions Generator in a closed chamber. After 15, 30, 45 and 60 minutes brought out one media each time. The unexposed media was used as a control. Incubate all media in incubator and read result after 3 weeks. Standard strain was repeated test for 3 times.
Result: For standard strains of *M. tuberculosis* there was no growth after exposure time of 30 minutes. For clinical isolate strains, there was no growth after exposure time of 15, 30, 45 and 60 minutes in 4 (8%), 4 (8%), 9 (18%) and 19 (38%) strains respectively. In 14 (28%) strains which has growth on media after 60 minutes of exposure, the number of colony on media was declined according to the longer exposure time.
Conclusion: Plasmacluster ions can kill *M. tuberculosis.*

PS-101427-13 Financing of TB in a low-income country: the case of DRC

F Kalunga,[1] S Kavuke,[1] G Kabuya,[1] M Kaswa,[1] G Bakaswa,[2] S Bisuta,[1] J P Oklata.[1] [1]National Program Tuberculosis, Kinshasa, [2]Damian Action, Kinshasa, Democratic Republic of the Congo. e-mail: kmutala@yahoo.fr

Introduction: The TB Program has a Development Plan 2006-2015, which cost $545 861 560. Since 1996, the NTP applies the DOTS. The detection rate remains low (61%), but the success rate in treatment of new cases TPM + is 85% in 2005. The NTP is supported by the Government, the Global Fund (in Rounds 2, 5 and 6), Action Damien TLMI, USAID, The Union, WHO, ALM, UBS, CE detection rate is increasing with increased funding.
Objective: To show how PNTLT DRC could achieve efficient outcomes (indicators WHO) with a diversity of donors and the mode of financing.
Methodology: Full analysis of how and financing strategies of the Strategic Plan NTP DRC from 2006 to 2009.
Results: Four years after the implementation of its Strategic Plan, the NTP has mobilized $79 079 743 (14.49%). The Gap cover is $466 781 820 (85.51%) until 2015.
Conclusion: End 2009, the Strategic Plan has been funded at 14.49% and the number of diagnosed patients has increased from 98 139 to 111 851 for the same period.

PS-101444-13 Recruiting adolescents for an epidemiology study in Uganda in preparation for TB vaccine trials

J Waako,[1] A Wajja,[2] P Nabongo,[1] H Mayanja-Kizza.[2,3] [1]TB Study, Iganga/Mayuge Demographic Surveillance Site, Iganga, [2]Infectious Diseases Institute, Makerere College of Health Sciences, Kampala, [3]Department of Medicine, Makerere College of Health Sciences, Kampala, Uganda. e-mail: awajja@idi.co.ug

Background: A number of novel TB vaccines currently in early phases of development will need to be tested in large phase III trials in developing countries. Adolescents, a potential target population are not a usual target for vaccines and require both proxy consent and assent to participate. As a prerequisite, it is important to determine the incidence of TB and feasibility of forming, tracking and retaining a cohort in this population. As part of site preparation, we are conducting an epidemiological study to estimate the incidence and prevalence of Tuberculosis disease among adolescents in the Iganga/Mayuge Demographic Surveillance Site in Uganda.
Methods: A cohort of 7000 adolescents aged 12–18 years is being recruited and followed for two years. Adolescents identified from the DSS database are visited at home to obtain parental consent while assent is obtained at school. At enrolment, key demographic parameters, vital signs and relevant medical history are collected. All participants have TST administered to determine annual risk of TB infection. Participants identified as TB suspects as defined by the protocol undergo TB diagnostic work up which includes sputum coaching and collection of 2 sputum samples.
Results: Difficulty in obtaining parental consent and adjusting to the school calendar and schedule are the main challenges in recruitment. Out of 1269 participants enrolled, 1179 (93%) are school going. A total 499 met the criteria for TB diagnostic work up; 224 were TST positive (≥10 mm), 69 had cough of ≥14 days and 106 had positive household contacts. So far, there are 6 smear positive participants of whom 4 are culture confirmed *M. tuberculosis* but none have HIV.
Conclusion: Early results indicate there is TB in this population and recruitment is feasible however sites need to devise ways of addressing the challenges.

PS-100778-13 The nutritional status IFN-γ response of household and non-household tuberculosis contacts

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Background: Malnutrition has long been associated with the development of tuberculosis and may be re-

September 18, 2014

In an investigator initiated[*1] clinical trial, Plasmacluster Ion technology[*2] reduced airway inflammation in pediatric patients with mild[*3] to moderate[*4] atopic asthma

In investigator initiated clinical research[*5] commissioned by Sharp, results were obtained in exploratory analysis[*6] indicating that Plasmacluster Ion technology reduced the level of airway inflammation in pediatric patients with mild to moderate atopic asthma (FeNO[*7] value less than 90).

Sharp commissioned The University of Tokyo Hospital, Clinical Research Support Center, to conduct this research, and provided special Plasmacluster Ion generators for use in the clinical study. Mr. Yasuo Ohashi, Emeritus Professor of The University of Tokyo, and also a Professor on the Faculty of Science and Engineering at Chuo University, assumed responsibility for data analysis and design of the clinical research. In addition, Mr. Toshio Katsunuma, Associate Professor, Department of Pediatrics, The Jikei University Daisan Hospital, served as coordinator of trial sites and was in charge of recruiting subjects as well as testing and measurement.

This clinical study targeted 130 pediatric patients with mild to moderate atopic asthma, In this clinical research study, special Plasmacluster Ion generators producing an ion concentration of 100,000 ions/cm^3 were set up in the home in two rooms where the subjects spent long periods of time selected from among the bedroom, living room, and children's room (nursery). Observations were made for eight weeks before and eight weeks after activation of the Plasmacluster Ion generators using the individual randomized crossover double-blind comparison protocol[*8].

This clinical study found that the level of airway inflammation in children with atopic asthma was reduced, and that Plasmacluster Ion technology[*2] will contribute to human health in an actual living environment.

Dust mite allergens are one of the major antigens causing asthma. Thus far, Sharp has proven that Plasmacluster Ions have an inhibitory effect against airborne dust mite allergens[*9], which are in dust mite fecal pellets and body fragments, and also went on to elucidate the mechanism underlying the inhibition of these allergens[*10].

In the future, Sharp will push ahead with further development of Plasmacluster Ion technology[*2] and continue to prove its efficacy with the aim of creating a healthy environment.

It should also be noted that the details of this clinical study are scheduled to be presented by the research group (Professors Yasuo Ohashi and Toshio Katsunuma) at the 51st Annual Meeting of the Japanese Society of Pediatric Allergy and Clinical Immunology to be held beginning November 8, 2014.

Comments by Mr. Yasuo Ohashi, Emeritus Professor of The University of Tokyo, and Professor, Faculty of Science and Engineering, Chuo University

This double-blind randomized clinical study of a home appliance technology for pediatric asthma patients is unique, and I can say that there is a strong trailblazing spirit in this current study. The findings indicate that there is a potential for Plasmacluster Ion technology to reduce the level of airway inflammation in pediatric patients with mild or moderate atopic asthma. This study will contribute to the development and deployment of the methodology, and I think it suggests that Plasmacluster Ion technology will make a difference in the world.

Comments of Mr. Toshio Katsunuma, Associate Professor, Department of Pediatrics, The Jikei University Daisan Hospital

Plasmacluster Ion technology is not a drug nor even medical equipment. This technology shows the potential to suppress respiratory tract inflammation in children with mild to moderate asthma and to improve their respiratory function, and I think this is highly significant with respect to undertaking long-term care of asthmatic children.
It is my hope that this data will bring good news to children with asthma and to their families.

*1 The University of Tokyo Hospital, Clinical Research Support Center was commissioned to conduct this research and provide research support.

*2 Plasmacluster is a registered trademark of Sharp Corporation.

*3 Mild asthma is defined as having coughing or wheezing symptoms more than once a month but not more than once a week. At times, it may be accompanied by difficulty in breathing. Duration is short, and interference in daily life is minimal (based on the Japanese Pediatric Guideline for the Treatment and. Management of Asthma 2012).

*4 Moderate asthma is defined as having coughing or wheezing symptoms at least once week, but not continuing on a daily basis. On occasion, it may manifest as a moderate to severe attack, and disrupts sleep and/or normal daily activities (based on the Pediatric Guideline for the Treatment and. Management of Asthma 2012).

*5 The University of Tokyo Hospital, Clinical Research Support Center, the organization contracted to conduct this research, is independent of Sharp Corporation and was commissioned to provide support in the form of planning of clinical research to implementation and reporting.

*6 Prior to the start of the study, it was determined that the analysis would cover all subjects. However, under this criteria, it was not possible to verify the effects of Plasmacluster Ion technology, most likely because subjects suffering from high levels of inflammation were included. By limiting the range of subjects, an improvement in respiratory function was found, for which expectations were initially low.

*7 Fractional exhaled nitric oxide, a measure of the concentration of NO in exhaled breath. An indicator of the level of airway inflammation.

*8 A protocol for clinical trials designed to objectively examine the efficacy of investigational new drugs.

*9 Announced on September 3, 2003.

*10 Announced on July 21, 2006.

Overview of Clinical Research

Participants

130 asthma patients between the ages of 6 and 15 years, with mild*3 or moderate*4 cases of atopy

Research design

Subjects were randomly split into two groups, and ion generators made specifically for clinical research were placed in their homes.
The individually randomized double-blind crossover comparison protocol*8 was used.

Period

August 9, 2013 to May 30, 2014

Assessment items

Change in FeNO value*7, change in asthma symptoms, change in respiratory function value, QOL (quality of life)*11

Ion density of ion generating device made specifically for clinical research

Maximum ion density of approximately 100,000 ions/cm^3

Test results

• For subjects who had an initial FeNO value*7 of 90 or less, compared to the placebo device*12, use of the ion generating device made specifically for clinical research resulted in a decrease (an improvement) in the FeNO value*7, which is one of the indicators of inflammation.

• For subjects who had an initial FeNO value*7 of 90 or less, compared to the placebo device*12, use of the ion generating device made specifically for clinical research resulted in an increase (an improvement) in V_{25}*13,which is one of the indicators showing constriction of peripheral airways of lungs.

• Compared to pre-test values, by the end of the test there was a decrease (an improvement) in the QOL score.

*11 QOL: Like the name suggests, Quality of Life is an assessment of the quality of a person's day-to-day living conditions.

*12 Placebo device: A device that disperses air without Plasmacluster Ions.

*13 An indicator of the state of the airways (in particular the peripheral airways of lungs), one of the factors of respiratory functions.

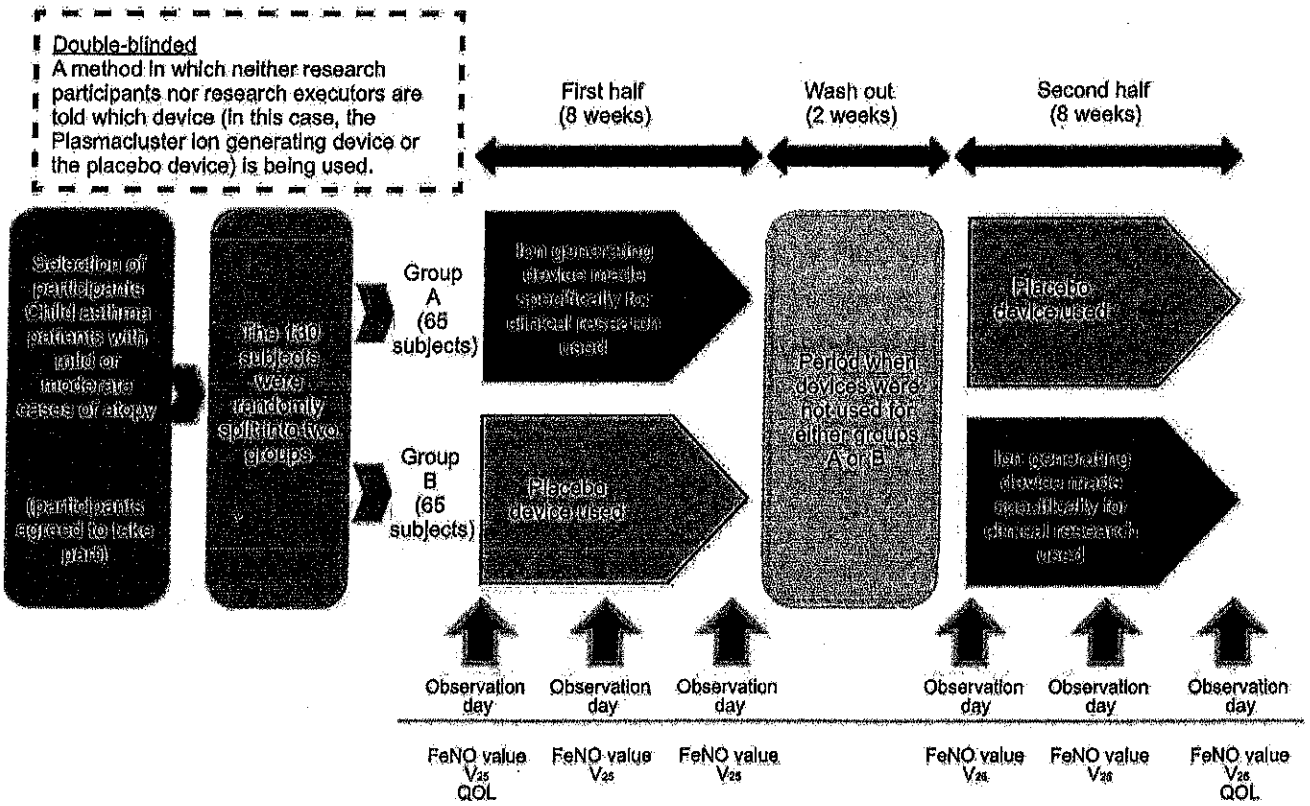

Diagram of research design

RETROSCREEN VIROLOGY

Final Report

CONFIDENTIAL

Evaluation of the SHARP Plasmacluster Ions Air Purification Technology Product against the Avian Influenza virus H5N1 and Urbani SARS virus

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Study No: PNT-PCS-003
Date Issued: 21 OCT 2005

Total number of pages: 48

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).

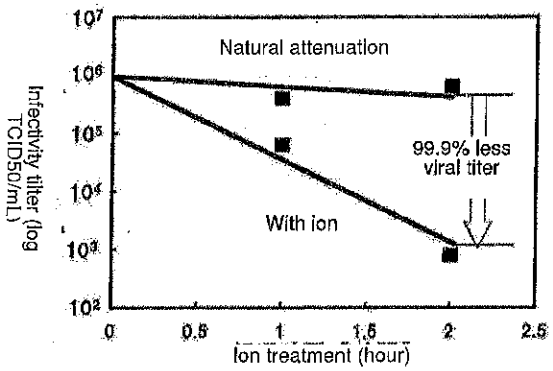
*7 Joint research conducted with Professor Gerhard Artmann, of Aachen University of Applied Sciences (2005).

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

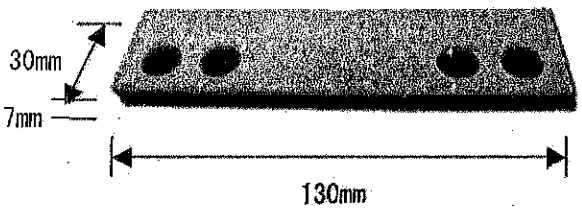
Using a high-density Plasmacluster ion generator, an ion concentration of approximately 300,000 ions/cm^3 was sprayed on the new-type H1N1 influenza virus in stationary form (drops of the virus placed in a plastic petri dish) for a set period of time.

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



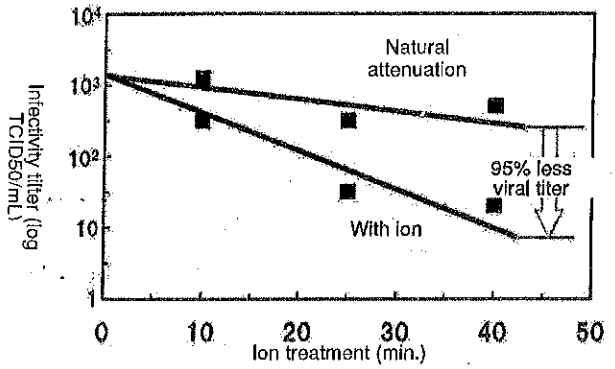
*8 A value indicating the capacity of a virus to infect cells.

*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.

FINAL REPORT:

VERIFICATION OF EFFICACY
SHARP PLASMACLUSTER IONS TECHNOLOGY
AGAINST
AIRBORNE *Serratia marcescens*
USING AIR PURIFIER MODEL: FU-S51CX
(without active carbon filter and HEPA filter)

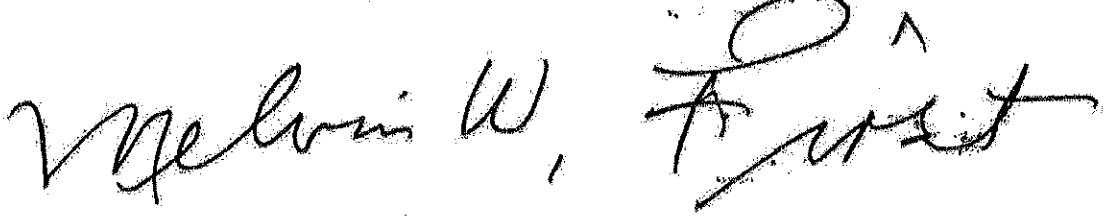
(Study No. MF01-2007)

March 9, 2007

Melvin W. First

Professor of Environmental Health Engineering, Emeritus

Harvard School of Public Health



November 13, 2009

Sharp's Plasmacluster[*1] Technology Proven Effective in Inhibiting the Activity of Adherent and Airborne Methicillin-Resistant Staphylococcus Aureus[*3] (MRSA), a Typical Bacterial Cause of Hospital-Acquired Infections[*2]

Sharp Corporation, working together with the Kitasato Institute Medical Center Hospital at the Kitasato Institute of Kitasato University, has proven that High-Density Plasmacluster ions inhibit the activity of Methicillin-resistant Staphylococcus aureus (MRSA[*3]), a typical bacterial cause of hospital-acquired infections, both when airborne and when adhering to surfaces.

These experiments proved that high-density Plasmacluster ions (at an ion density of approximately 25,000 ions/cm^3) inhibit the activity of adherent MRSA (as plane state on a petri dish) by approximately 99.9% in eight hours, and the activity of airborne MRSA (as a suspension in a box having a volume of one cubic meter) by approximately 99.9% in 20 minutes.

Additional experiments verified the effectiveness of Plasmacluster ions in inhibiting the activity of airborne multidrug-resistant Pseudomonas aeruginosa[*4] (MDRP) by approximately 99.9%, and the viral infectivity of airborne Coxsackie virus[*5], by approximately 99.9% (see table below for more details on verified efficacy). Both of these microorganisms are similarly the source of hospital-acquired infections.

These experimental proofs demonstrated that high-density Plasmacluster ions have an inhibitory effect on the activity of adherent MRSA, as well as confirmed that the higher the ion density, the greater the inhibitory effect on the activity of airborne MRSA and MDRP and on the infectivity of airborne Coxsackie virus.

Sharp's collaborative research with academic and research organizations*6 around the world began in 2000 and has since proven that Plasmacluster ions are effective in inhibiting the activity of 28 kinds of harmful substances, including the new-type H1N1 influenza virus*7. In 2002, research also confirmed the safety of high-density Plasmacluster ions with respect to human health*8, and in 2004, joint research with an academic research institution*9 elucidated the mechanism by which Plasmacluster ions destroy the proteins on the surface of microorganisms.

In the future, Sharp intends to further its efforts for improving the effectiveness of Plasmacluster technology to create a healthy environment.

Verified Effectiveness of Plasmacluster Ions

Target Substance	Ion Density (ions/cm^3)	Verified Effectiveness
Adherent MRSA	25,000	Reduced by approx. 99.9% in 8 hours
Airborne MRSA	25,000	Reduced by approx. 99.9% in 20 minutes
	7,000	Reduced by approx. 99.9% in 30 minutes
Airborne MDRP	25,000	Reduced by approx. 99.9% in 30 minutes
	7,000	Reduced by approx. 99.9% in 40 minutes
Airborne Coxsackie virus	25,000	Reduced by approx. 99.9% in 20 minutes
	7,000	Reduced by approx. 99.9% in 30 minutes

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

*2 Microorganisms that cause hospital-acquired infections (known as nosocomial infections) include bacteria, viruses and other pathogens that are the source of infections occurring in patients in the clinical setting (hospitals, healthcare facilities, etc.).

*3 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.

*4 MDRP is an acronym for multidrug-resistant Pseudomonas aeruginosa. MDRP infections in critically ill patients have become a serious clinical problem in hospitals and other health care settings because of the limited number of antibiotics that are effective against this bacteria.

*5 Coxsackie virus is a group of human pathogens that can cause nonspecific febrile illnesses (called "summer colds" in Japan), upper respiratory tract disease and meningitis.

*6 Sharp has adopted a collaborative research approach to product marketing in which the effectiveness of a technology is verified based on scientific data developed in collaboration with leading-edge academic research institutions. New products are then brought to market based on the results.

*7 A new-type H1N1 influenza virus first confirmed in Mexico and the US in 2009, which is now causing a global pandemic.

*8 Testing conducted by Mitsubishi Chemical Medience Corporation. (inhalation toxicity, as well as eye and skin irritation/corrosion tests).

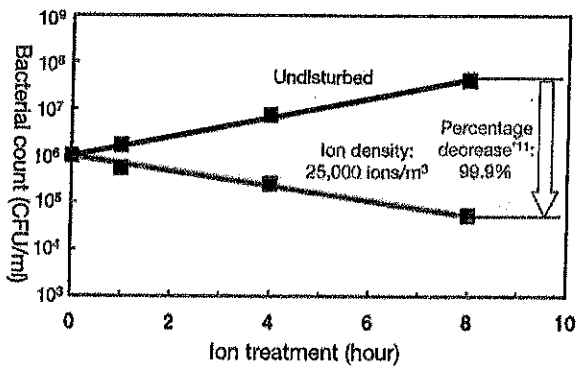
*9 Joint research conducted with Professor Gerhard Artmann, of Aachen University of Applied Sciences.

Method for Proving Effectiveness Against Adherent Methicillin-resistant Staphylococcus aureus (MRSA)

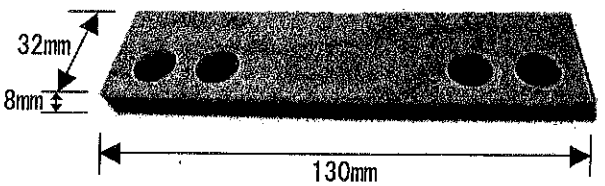
Adherent MRSA bacteria (in the form of an emulsion dripped onto a plastic petri dish) was exposed for a prescribed length of time to Plasmacluster ions generated by a high-density Plasmacluster ion generator at a density of approximately 25,000 ions/cm^3.

After eight hours of exposure, the adherent MRSA bacteria was collected and a study done to count the number of microorganisms using a culture technique*10 commonly employed in the field of microbiology research. The results confirmed that the number of bacteria decreased by approximately 99.9% compared to the natural state not exposed to Plasmacluster ions.

Change over time in numbers of adherent MRSA



High-Density Plasmacluster Ion Generator



*10 A method of inoculating a medium with bacteria and then studying the number of bacterial colonies that form (bacterial count).

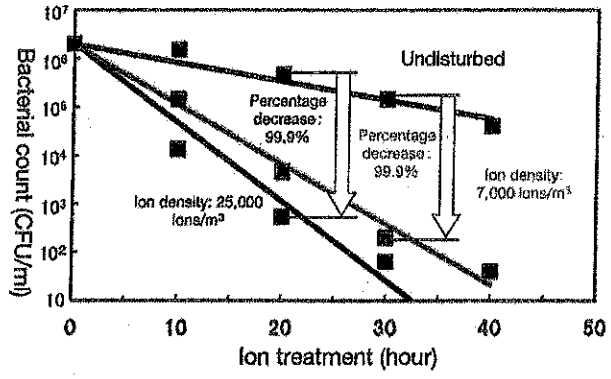
*11 Stated as the percentage of decrease in the bacteria count resulting from exposure to Plasmacluster ions compared to the count of bacteria left undisturbed in their natural state.

Method for Proving Effectiveness Against Airborne Methicillin-resistant Staphylococcus aureus (MRSA), Multidrug-resistant Pseudomonas aeruginosa (MDRP), and Coxsackie Virus

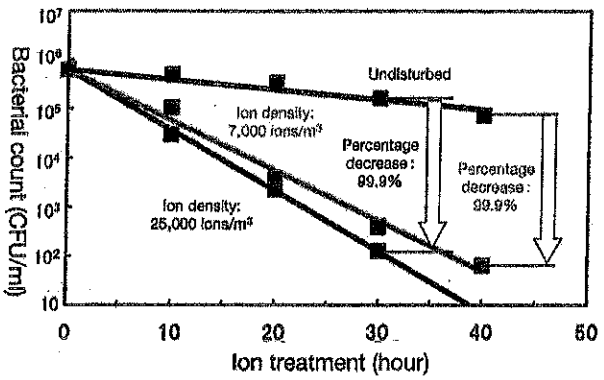
A high-density Plasmacluster ion generator was placed in a box having a volume of 1 m^3. Plasmacluster ions were generated (at densities of 25,000 ions/cm^3 and 7,000 ions/cm^3) and MRSA, MDRP and the Coxsackie virus were separately sprayed in mist form into the box. After a prescribed time, samples of the airborne microorganisms inside the box were collected, and studies were done, in the case of the bacterial substances, using the culture method to obtain a bacterial count, and in the case of the virus, using the $TCID_{50}$ method*12 commonly used in the virology research field to obtain a measure of infectivity (viral

infectivity titer). The results confirmed that the higher the ion density, the greater the inhibitory effect on the activity of airborne MRSA and MDRP, and on the viral infectivity of airborne Coxsackie virus.

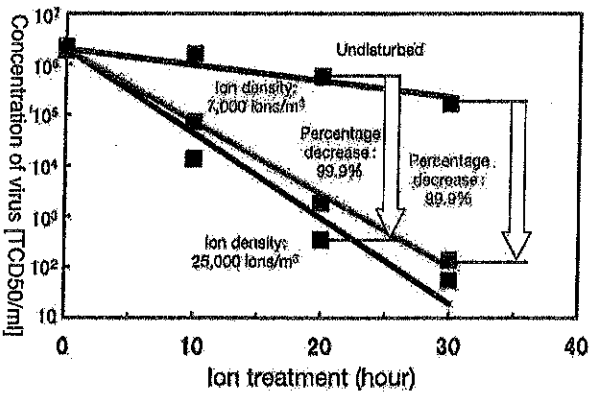
Change over time in bacterial count of airborne MRSA



Change over time in bacterial count of airborne MDRP



Change over time in viral titer of airborne Coxsackie virus



About the Kitasato Institute Medical Center Hospital, Research Division

The Kitasato Institute was founded in 1914 by Dr. Shibasaburo Kitasato to contribute to the improvement of the health of the nation by researching the causes of diseases and approaches to preventative treatments, and by operating medical treatment facilities. The Research Division of the Kitasato Institute Medical Center Hospital is involved in numerous clinical investigations as well as basic research. As part of these programs, a Medical Environmental Science Center was established within the Institute along with construction of hospital rooms specially designed to prevent the spread of infection. The Research Division is engaged in R&D with the goal of improving and enhancing the healthcare environment from a comprehensive perspective.

*12 TCID50 (50% Tissue Culture Infective Dose) method is 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.

DR. UTPAL NARESH PATEL M.D.

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Kolkata - 700 017
Ph. : 2283 7407 / 8 / 9
Tuesday & Thursday
5 p.m. to 7 p.m.
Saturday 2 p.m. to 4 p.m.
(By Appointment only)

Chamber
13, Ram Mohan Dutta Road
Kolkata - 700 020
Ph.: 2475 1611
Mobile : 98300 57403
Monday to Saturday
12 p.m. to 1 p.m.
Monday to Friday
7.30 p.m. to 8.30 p.m.

Air Pollution has enhanced the risk of several respiratory and cardiovascular diseases. We recommend immediate action to combat the menance and safeguard health. Most of these pollutants enter our homes and other closed spaces, moreover air conditioning further worsen them. It is also important for us to understand that breathing fresh air atleast for 8 to 10 hours a day will help in enhancing our immune system.
I have been using a SHARP Plasmacluster Air Purifier and I find a significant good change in the ambient air. This gadget should help all especially people suffering with asthma. My best wishes to SHARP & Promises Marketing.

Dated: October 10th 2012

(Dr. U. N. Patel)
46337

Japan Food Research Laboratories

Test Report
試験報告書

No. 20807071G-001
第 20807014-001 号
2008年(平成20年)07月23日
23th, July, 2008.

Client ; SHARP Corporation
依頼者 シャープ株式会社

Specimena Sample ; written in this report
検体 本報告書中

Title ; Observation of mold growth
表題 かび発育の観察

2008年(平成20年)07月09日当センターに提出された
上記検体について試験した結果は次の上おりです。

The results are shown as follows ;

of test legarding specimena sample above provided to us on 9th, July, 2008

(Incorporated foundation)
Japan Food Research Laboratories

財団法人 日本食品分析センター
Tokyo-H/Q 東京本部 〒151-0063 東京都渋谷区富ヶ谷2丁目14番19号
Osaka-B/O 大阪支所 〒564-0051 大阪府吹田市豊津町3番1号
Nagoya-B/O 名古屋支所 〒460-0011 名古屋市中区大須4丁目5番13号
Kyushu-B/O 九州支所 〒812-0034 福岡市博多区下呉服町1番12号
Tama-Research Centre 多摩研究所 〒206-0025 東京都多摩市永山6丁目11番10号
Chitose-Research Centre 千歳研究所 〒066-0052 北海道千歳市文京2丁目3番
Saito-Research Centre 彩都研究所 〒567-0085 大阪府茨木市彩都あさぎ7丁目4番41号

Address

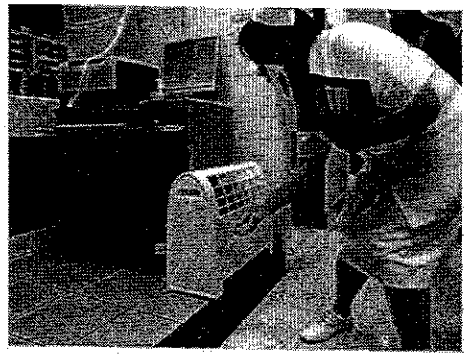
ชาร์ป พลาสม่าคลัสเตอร์
สร้างความมั่นใจทางการแพทย์ ต่อสู้ไข้หวัดใหญ่สายพันธุ์ใหม่ 2009

โรงพยาบาลรามาธิบดีเป็นหนึ่งในกลุ่มโรงพยาบาลที่มีบทบาทสูงในการตรวจรักษาผู้ป่วย โรคไข้หวัดใหญ่สายพันธุ์ใหม่ 2009 และพบว่ามีการใช้เทคโนโลยีในการฟอกอากาศของชาร์ป พลาสม่าคลัสเตอร์

หลังการแพร่ระบาดของโรคไข้หวัดใหญ่สายพันธุ์ใหม่ 2009 ในประเทศมาระยะหนึ่ง คนไทยเริ่มได้รับข้อมูลที่ชัดเจนขึ้นทั้งด้านการรักษาและการป้องกัน ไม่ว่าจะเป็นเรื่องของการดูแลตนเอง และการอยู่ร่วมกันในชุมชนเพื่อยับยั้งการแพร่ระบาด ขณะที่วงการต่างๆ ขยับตัวไปในทิศทางเดียวกันที่จะหาเทคโนโลยีใหม่ๆ เข้ามาช่วย โดยเฉพาะการรับมือกับเชื้อโรคในอากาศที่อาจก่อการตรวจจับว่าแหล่งชุมชนใดบ้างที่เราจะสามารถอยู่หรือเข้าร่วมกิจกรรมได้อย่างสบายใจ

การแพร่ระบาดของโรคทางเดินหายใจนั้นไม่ใช่เรื่องใหม่ แต่ทุกครั้งบุคลากรทางการแพทย์ต้องกลุ่มเสี่ยงต้นๆ ที่ต้องเผชิญหน้ากับปัญหา จึงเป็นที่มาของการใช้เทคโนโลยีในการดูแลระบบอากาศในพื้นที่ที่ต้องให้บริการทางการแพทย์ นอกเหนือจากมาตรการทั่วไป เช่น การใช้เจลล้างมือ และการใช้หน้ากากอนามัย

โรงพยาบาลรามาธิบดีเป็นหนึ่งในกลุ่มโรงพยาบาลที่มีบทบาทสูง



ในการตรวจรักษาผู้ป่วยโรคไข้หวัดใหญ่สายพันธุ์ใหม่ 2009 และพบว่ามีการใช้เทคโนโลยีในการฟอกอากาศของชาร์ป พลาสม่าคลัสเตอร์ ซึ่งทำให้น่าศึกษาว่า บทบาทของเทคโนโลยีการฟอกอากาศกับวงการแพทย์ และการต่อสู้กับการแพร่ระบาดของโรคไข้หวัดใหญ่สายพันธุ์ใหม่ 2009 นั้น เกี่ยวข้องกันอย่างไร โดยหลักการเบื้องต้น **ผู้ช่วยศาสตราจารย์ นายแพทย์วิชิต ชีวเรืองโรจน์ หัวหน้าภาควิชา โสต ศอ นาสิกวิทยา** คณะแพทยศาสตร์ โรงพยาบาลรามาธิบดี กล่าวว่า ทางภาควิชาให้ความไว้วางใจเลือกใช้ เครื่องฟอกอากาศชาร์ป พลาสม่าคลัสเตอร์ ในการฆ่าเชื้อไวรัส เชื้อแบคทีเรียและเชื้อราในอากาศ โดยนำเครื่องที่มีอยู่จำนวน 10 เครื่องไปวางไว้ในแผนกตรวจคนไข้ เพื่อลดความเสี่ยงในการติดเชื้อของบุคลากรทางการแพทย์และพยาบาล รวมถึงคนไข้ที่มานั่งรอรับการรักษา

และในที่นี้ นายแพทย์วิชิต ชีวเรืองโรจน์ หัวหน้าภาควิชา ยังได้กรุณาให้ความเข้าใจอย่างแจ่มชัดถึงศักยภาพและการจัดการอย่างสัมพันธ์กันระหว่างเทคโนโลยีของระบบฟอกอากาศกับบุคลากรทางการแพทย์ที่เป็นกลุ่มเสี่ยงของโรคติดต่อของระบบทางเดินหายใจ

การจัดการในการใช้ชาร์ป พลาสม่าคลัสเตอร์ในพื้นที่

"การมีเครื่องฟอกอากาศชาร์ป พลาสม่าคลัสเตอร์ ในแผนกตรวจคนไข้ หู คอ จมูก ของโรงพยาบาลรามาธิบดี ทำให้บุคลากรทางการแพทย์มีความสบายใจและมั่นใจมากขึ้นเพราะจะช่วยลดความเสี่ยงในการติดโรคที่มากับระบบทางเดินหายใจจากผู้ป่วย ทางภาควิชาได้ติดตั้งเครื่องฟอกอากาศไว้สองส่วน หนึ่งคือห้องรวมใหญ่ซึ่งเป็นจุดให้บริการที่มีคนรวมกันอยู่มากๆ ทั้งผู้ป่วย ญาติ และเจ้าหน้าที่ทางการแพทย์โดยใช้เครื่องใหญ่กับอีกส่วนที่เป็นห้องแยกตรวจเป็นห้องเล็ก จะมีผู้ป่วย 1 คนกับแพทย์และผู้ช่วยแพทย์ ส่วนนี้เราใช้เครื่องเล็กลง"

ศักยภาพของชาร์ป พลาสม่าคลัสเตอร์ ต่อจำนวนคนมากๆ ในแต่ละวัน

"ปกติแล้วระบบการถ่ายเทอากาศในห้องตรวจโรคของโรงพยาบาลถ้าจะให้ดีที่สุดต้องเป็นห้องระบบ positive pressure คือ ลมเข้าด้านหนึ่งออกด้านหนึ่ง ไม่มากองอยู่ภายในห้อง แต่หากทำระบบนี้ไม่ได้ ก็สามารถใช้อุปกรณ์ทดแทน อย่างเครื่องฟอกอากาศที่รีโอโซน เพื่อช่วยลดหรือกำจัดเชื้อโรคตกค้างที่ล่องลอยอยู่ในอากาศ จึงทำให้เราคิดถึงเครื่องฟอกอากาศที่สามารถกำจัดเชื้อโรคได้จริงๆ ระบบฟอกอากาศนั้นมีหลายแบบด้วยกัน เช่นแบบมีเครื่องกรองแบบมีเครื่องยิงประจุ แต่สำหรับของชาร์ป มีการสร้างไอออนบวกและลบ ที่พบได้ตามธรรมชาติขึ้นมาจับโมเลกุลของไอน้ำในอากาศ แล้วไปจับกับผนังเซลล์ของเชื้อโรค ทำให้เชื้อโรคตายไปในที่สุด

"นอกจากนี้ยังช่วยเรื่องกลิ่นเพราะจะช่วยลดกลิ่นที่อับชื้นลงได้ ทำให้อากาศสดชื่นขึ้น แต่ต้องใช้ควบคู่กับการป้องกันด้วยหน้ากากอนามัย เพราะหากว่าอยู่ใกล้ชิดกับผู้ป่วยจริงๆ อาจมีละอองน้ำลายหรือเสมหะที่อาจสัมผัสได้ ซึ่งเจ้าหน้าที่และบุคลากรทางการแพทย์ต้องป้องกันส่วนหนึ่งไว้ก่อน แล้วตัวเครื่องจะช่วยฟอกอากาศรอบๆ เท่าที่สังเกตดูตั้งแต่ติดตั้งเครื่องฟอกอากาศมา ชาร์ป พลาสม่าคลัสเตอร์ มาได้ 3-4 สัปดาห์ ยังไม่พบว่ามีบุคลากรทางการแพทย์เป็นหวัดหรือติดเชื้อ ซึ่งทำให้เจ้าหน้าที่มีกำลังใจดีขึ้นเพราะเขาเห็นว่าทางภาควิชาได้ดูแลเขาเป็นอย่างดี มันได้ผลทางด้านจิตใจด้วยครับ"

ก่อนตัดสินใจเลือกใช้ชาร์ป พลาสม่าคลัสเตอร์ ต้องศึกษาหาข้อมูลนานเพียงใด

"ใช้เวลาไม่นาน เพราะแต่ก่อนที่บ้านหมอก็มีเครื่องปรับอากาศที่มีระบบฟอกอากาศของชาร์ปอยู่ ใช้มาถึงเชื่อมั่นในประสิทธิภาพ การตัดสินใจจึงไม่ยาก เพราะเครื่องฟอกอากาศทั่วไปจะเป็นระบบการกรองอากาศ แต่มีของชาร์ปเท่านั้นที่มีระบบไอออนที่ใช้สร้างอนุมูลขึ้นมาจับเชื้อโรค"

นายแพทย์วิชิต ชีวเรืองโรจน์

มองถึงการป้องกันในที่สาธารณะอื่นอย่างไร

"ต้องพยายามทำให้ระยะห่างของคนที่อยู่รวมกันมีมากขึ้น เช่น โรงภาพยนตร์ และโรงเรียนภาควิชาต้องจัดเก้าอี้นั่งให้มีระยะห่างกันมากขึ้นก่อน ไม่อย่างนั้นหากไอหรือจาม จะมีละอองติดต่อกันได้ แล้วในห้องปรับอากาศถ้ามีติดตั้งระบบฟอกอากาศเข้าไป ก็จะสามารถช่วยลดการติดต่อลงได้อีกระดับหนึ่ง

"แต่การป้องกันตัวเองก็สำคัญ เพราะหากร่างกายแข็งแรงก็จะช่วยป้องกันการติดต่อของโรคต่างๆ ได้ ดังนั้นจึงควรนอนหลับพักผ่อนให้เพียงพอ รับประทานอาหารที่มีประโยชน์ ไม่เน้นพวกแป้งหรือโปรตีนมากเกินไป แต่ควรเพิ่มการรับประทานอาหารในกลุ่มผักและผลไม้ซึ่งจะช่วยเสริมสร้างภูมิต้านทาน หากมีการเจ็บป่วยของคนในครอบครัวก็ควรจับแยกเพื่อไม่ให้ติดต่อกัน ต้องออกกำลังกายสม่ำเสมอ และอาจป้องกันโรคบางอย่างด้วยการใช้วัคซีน"

ประชาชนให้ความร่วมมือในการป้องกันโรคในระดับใด

"เป็นเรื่องที่ดี แต่ไม่ควรเป็นการวิตกมากเกินไป ทุกโรคมีผู้ป่วยเสียชีวิตได้อยู่แล้ว รวมถึงไข้หวัดตามฤดูกาลที่เกิดขึ้นทุกปีด้วย แต่การตื่นตัวในการป้องกันตัวเองไม่ให้เป็นโรคนั้น ควรเป็นเรื่องที่ได้รับการรณรงค์อย่างต่อเนื่อง ไม่ใช่เกิดขึ้นเป็นพักๆ เพราะจากที่เคยเกิดการระบาดของโรคทางเดินหายใจเฉียบพลัน (SARS) ไข้หวัดนก จนมาถึงไข้หวัดใหญ่สายพันธุ์ใหม่ 2009 จะพบว่าคนจะตื่นตัวเป็นช่วงๆ แล้วซาลง เราควรรณรงค์ให้คนป่วยรู้จักใส่หน้ากากอนามัยป้องกันตัวเองทุกครั้งเวลาไปที่ชุมชนสาธารณะ และต้องรณรงค์ให้ยาวนาน ที่สำคัญต้องให้เกิดการยอมรับของคนทั้งหมด ไม่ใช่คนกลุ่มหนึ่งยอมรับ แต่อีกกลุ่มไม่ยอมรับ เหมือนกรณีการใส่หน้ากากอนามัย ที่มีข่าวว่ามีรถเก็บขี้กลัวผู้โดยสารที่ใส่หน้ากากอนามัยแล้วไม่ยอมรับขึ้นรถ"

ปัจจุบัน "ชาร์ป พลาสม่าคลัสเตอร์" มีองค์การเภสัชกรรม หรือ GPO เป็นตัวแทนจำหน่ายในฐานะที่ต้องรับผิดชอบและร่วมให้ความรู้เรื่องการรักษาสุขภาพแก่ประชาชน นอกจากการดูแลเรื่องยาและการสำรองยา ทั้งนี้เป็นผลมาจากการวิจัยทางการแพทย์จากหลายสถาบันที่เผยแพร่มายังองค์การเภสัชกรรม ทั้งจากประเทศอังกฤษและประเทศญี่ปุ่น ซึ่งชี้ว่าประสิทธิภาพและประสิทธิผลของเครื่องมือที่เรียกว่า "Ion Generator" ซึ่งผลิตประจุเข้มข้น สามารถจัดการกับเชื้อ H1N1 ได้ และมีคำแนะนำออกมาว่า เป็นเครื่องมือหนึ่งที่เหมาะสมจะใช้ในสถานที่สาธารณะเพื่อป้องกันการแพร่เชื้อ เช่น โรงแรม และโรงพยาบาล และเชื่อว่าเทคโนโลยี "ชาร์ป พลาสม่าคลัสเตอร์" จะช่วยลดความเสี่ยงในการติดเชื้อในอากาศ หรืออีกนัยหนึ่ง ตามคำชี้แจงของ ผู้ช่วยศาสตราจารย์ นายแพทย์วิชิต ชีวเรืองโรจน์ ที่ว่า **"ตั้งแต่ติดตั้งเครื่องฟอกอากาศ ชาร์ป พลาสม่าคลัสเตอร์ มา 3-4 สัปดาห์ ยังไม่พบว่ามีบุคลากรทางการแพทย์และเจ้าหน้าที่เป็นหวัดหรือติดเชื้อ ซึ่งทำให้เจ้าหน้าที่มีกำลังใจดีขึ้นเพราะเขาเห็นว่าทางภาควิชาได้ดูแลเขาเป็นอย่างดี มันได้ผลทางด้านจิตใจด้วย"**

จึงมองได้ว่าเครื่องมือและเทคโนโลยีนี้น่าจะมีบทบาทต่อใครๆ อีกหลายคน และหลายกลุ่มที่ต้องการดูแลกันและกัน และยังส่งผลต่อการช่วยควบคุมโรคระบาดที่มากับระบบทางเดินหายใจและประปนอยู่ในอากาศด้วย

English Translation of article from RAMATHIBODI HOSPITAL

Ramathibodi Hospital is a leading teaching hospital in Thailand for investigating the patients, suffered from Influenza type A H_1N_1 (swine flu) etc.

Assist.Prof. Wichit Cheewaruangroj , Head of Otolaryngology Department , Faculty of Medicine Ramathibodi Hospital , Mahidol University approved the installation of Plasmacluster ion generator in all Outer Patient Department area (ENT). The purpose is to reduce the airborne germs contamination among doctor , nurse and also crowded patients.

" After installing the Plasmacluster ion generator for 3-4 weeks, No doctor and nurse are suffered from flu or germ infection. It automatically motivates our staff morale during the heavily working situation." Dr. Wichit comments.

Hospital and doctor profiles :
http://www.ra.mahidol.ac.th/dpt/ET/researchWichitth
http://www.ra.mahidol.ac.th/en
http://www.ra.mahidol.ac.th/en/ramathibodi/departments-and-offices-en
http://www.ra.mahidol.ac.th/dpt/ET/home
http://www.ra.mahidol.ac.th/en/dpt/ET/home

Japan Food Research Laboratories

Test Report
試験報告書

No. 20807071G-001
第 20807071G-001 号
2008年(平成20年)07月23日
23rd, July, 2008.

Client ; SHARP Corporation
依頼者 シャープ株式会社

Specimena Sample ; written in this report.
検体 本報告書中

Title ; Observation of mold growth
表題 かび発育の観察

2008年(平成20年)07月09日当センターに提出された
上記検体について試験した結果は次の上おりです。

The results are shown as follows ;

of test legading specimena sample above provided to us on 9th, July, 2008

(Incoporated foundation)
Japan Food Research Laboratories.

→ 財団法人 日本食品分析センター

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-Report-

Specific protein and DNA damages in bacterial cells exposed to Plasma-Generated Cluster Ions (Task 3)

October 1, 2003 - September 30, 2004

Aachen, October 2004

Prof. Dr. habil. G.M. Artmann
(Cell and Tissue Technology)

June 4, 2010

Sharp Confirms Three Skin Beautifying Effects from Water Molecule Coating— Preserves Skin Moisture as Well as Improves Skin Elasticity and Texture

Mechanism Behind Skin Moisture Preservation by High-Density Plasmacluster Ions*1 (25,000 Ions/cm^3)*2 Explained

Sharp Corporation, in collaboration with Professor Michio Niwano of the Research Institute of Electrical Communication at Tohoku University, has proven that the skin moisture preservation effect of high-density Plasmacluster Ions (density of 25,000 ions/cm^3) announced in February of this year*3 is based on a mechanism in which the water molecules of the ions form a "water molecule coating" on the surface of the skin.

Further, through testing commissioned to Soiken Inc.*4, it was proven in actual living spaces (floor area of approximately 9.8 m^2 to 13.2 m^2) that three skin beautifying effects*5 can be obtained based on the water molecule coating function. The three effects are retaining skin moisture*3 (previously announced), improving skin elasticity, and improving skin texture.

Plasmacluster is Sharp's proprietary air purification technology based on positive and negative ions generated by applying a plasma discharge to the moisture and oxygen in the air. Working with academic research organizations around the world, Sharp has thus far proven that Plasmacluster technology is effective against 28 kinds of harmful substances. Research has also confirmed its safety*6.

Sharp currently has 11 of its own Plasmacluster-application products, and 24 companies in other business fields have also adopted Plasmacluster technology for use in products*7 as diverse as railway coaches and car air conditioners. In addition, the use of in-vehicle and professional-use Plasmacluster products is expanding to a wide variety of spaces including hotels, daycare facilities, and taxi interiors.

Sharp will use this new proven efficacy of Plasmacluster Ions to work toward even more widespread use of products incorporating Plasmacluster technology in the home, as well as in the office and in vehicles.

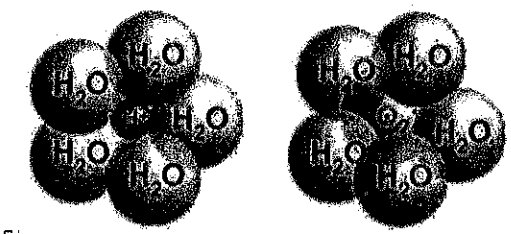
*1 Plasmacluster Ion and Plasmacluster are trademarks of Sharp Corporation.
*2 A measure of the number of ions/cm^3 emitted into the air measured at a point near the center of a room (at a height of about 1.2 m from the floor) having an appropriate floor surface area, during operation at the "high" airstream setting, when the high-density Plasmacluster Ion generator is placed near a wall.
*3 Announced on February 17, 2010.
*4 Soiken Inc. conducts clinical trials on a contract basis for the development of pharmaceuticals and foods.
*5 Effect will vary depending on the individual.
*6 Testing conducted by Mitsubishi Chemical Medience Corporation, including tests for inhalation toxicity and for skin and eye irritancy and corrosivity.
*7 Ion density differs with each product.

1. Mechanism for preserving skin moisture by high-density Plasmacluster Ions (25,000 ions/cm^3) explained

The positive and negative ions generated by the plasma discharge are surrounded by water molecules, and remain suspended in the air (Figure 1). Working in collaboration with Professor Michio Niwano of the Research Institute of Electrical Communication at Tohoku University, it was confirmed that the water molecules surrounding the ions adhered to the surface of a substance simulating human skin, forming a "water molecule coating." As a result, the mechanism by which the evaporation of water molecules from the skin is inhibited, thereby making it possible to obtain a moisturizing effect, was revealed. (Figure 2)

In testing, a Plasmacluster Ion generator was placed in a spectroscopic instrument to analyze the molecules of water. Infrared absorption spectroscopy (IRAS) with multiple internal reflection (MIR) geometry*8 was used to confirm the presence of a water molecular layer (water molecule coating)*9 on the surface of a plate designed to simulate human skin*10 when ions were being generated and when they were not being generated. It was confirmed that, when no ions were generated, there was no adhesion of water molecules. In contrast, when ions were being generated, the adhesion of water molecules was confirmed after approximately ten minutes*9 of ion generation, and it was shown that, after the generation of ions was stopped at approximately 80 minutes, the water molecule coating function persisted for several dozen minutes. (Figure 3)

*8 A method to detect chemical substances adhering to solid surfaces with high sensitivity.
*9 A plate made of a silicone is used.
*10 The water molecule layer is several nanometers (nm) thick; 1 nm = 1 millionth of a mm.



Water molecules in the air surround the positive and negative ions, forming stable cluster ions*11.

Figure 1: Schematic drawing of Plasmacluster Ions (conceptual rendering)

*11 These ions are shaped like clusters of grapes.

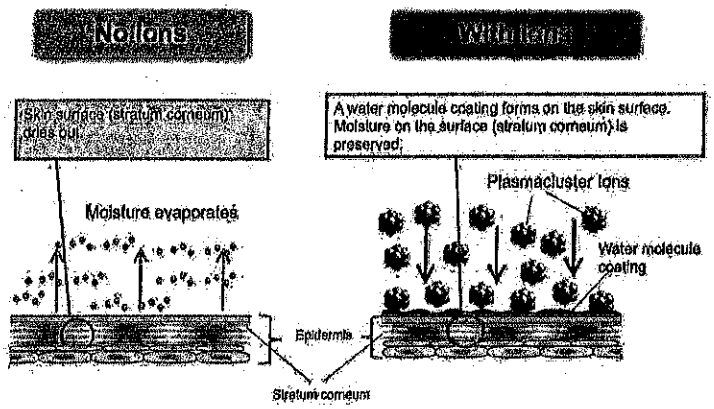


Figure 2: Skin moisture preservation mechanism (conceptual rendering) Water molecule coating function

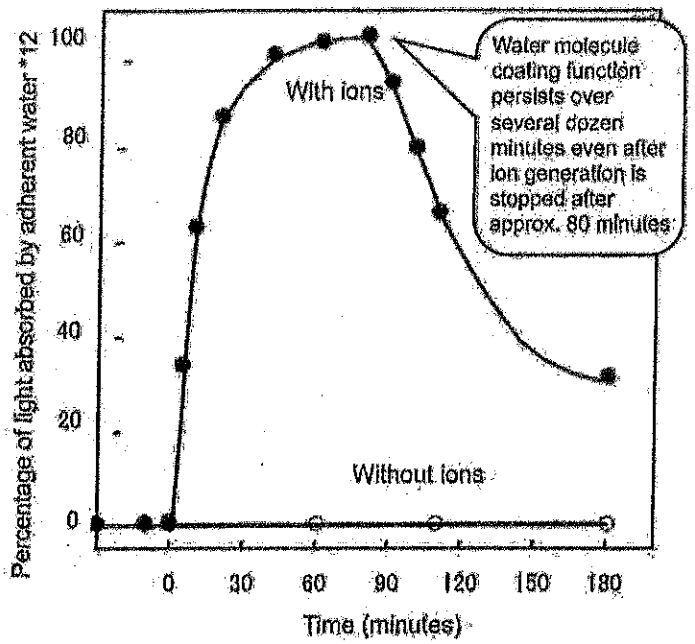


Figure 3: Change over time in percentage of light absorbed as a result of adherent water

*12 The higher the percentage of light absorbed by adherent water, the more water molecules attached to the skin.

Comments by Professor Michio Niwano of the Research Institute of Electrical Communication at Tohoku University

It was quite surprising that Plasmacluster Ions surrounded by water molecules adhered to the surface so readily. We also confirmed that Plasmacluster Ions readily adhere to surfaces where proteins have adsorbed, so the moisturizing effect of Plasmacluster Ions on the skin can be fully accepted. I hold out great expectations that this Plasmacluster technology will be able to find even wider application in the health-related field.

About the Research Institute of Electrical Communication at Tohoku University

The Research Institute of Electrical Communication (RIEC) was established in 1935 as a research institute affiliated with Tohoku Imperial University to study the theory of higher-order information and communication technologies and their practical application. The Institute takes the view that everything from the basic science of materials and information, to devices, circuitry, architectures, and software to generate, identify, transmit, store, process, and control information forms an integrated system. Based on organized collaboration with researchers inside and outside the Institute, it strives to extend its research findings to other areas and integrate its activities with groups working in other fields.

2. Proof of three skin beautifying effects based on the water molecule coating function of high-density Plasmacluster Ions (25,000 ions/cm^3)

1) Preserves skin moisture*13

The graph at the right shows the moisture preservation effect announced on February 17, 2010.

The fact that it is based on this water molecule coating function has now been explained.

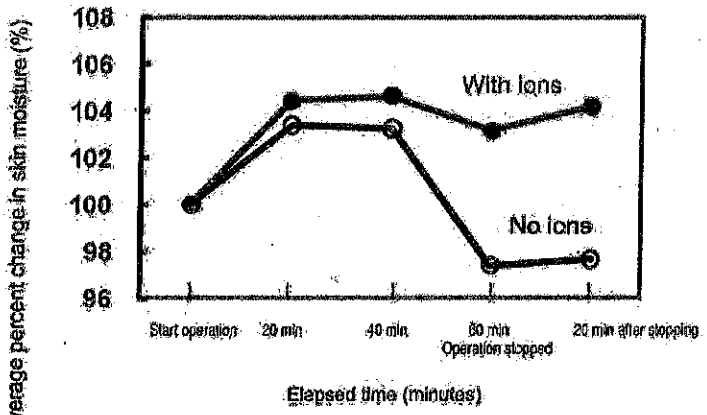


Figure 4: Change in skin moisture

*13 Test conditions for confirming the skin moisture preservation effect: a Plasmacluster Ion generator was set up in a testing room having a floor area of approximately 9.8 m^2 with the temperature adjusted to 28°C and humidity around 40% relative humidity (RH). Tests were conducted on 13 healthy female subjects ranging from 20 to 65 years of age. Announced on February 17, 2010.

2) Improves skin elasticity*14

A Plasmacluster Ion generator was used daily upon retiring at night. The elasticity of the skin was measured using a Cutometer® MPA580*15, an instrument commonly employed in medical research, at 14 days and 28 days after the start of use. The results confirmed that the elasticity of the skin in the cheek area of the face, which is regarded as an indicator of skin age*16, improved when the Plasmacluster Ion generator was used. (Figure 5)

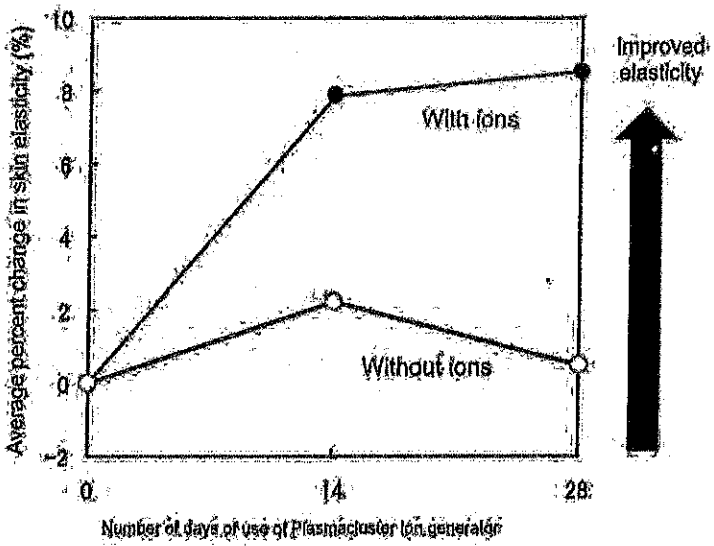


Figure 5: Change in skin elasticity

*14 A Plasmacluster Ion generator was set up in actual living spaces having floor areas of approximately 9.8 m^2 to 13.2 m^2. Tests were conducted on 24 healthy female subjects ranging from 30 to 65 years of age. The Plasmacluster Ion generator was used at bedtime every day for a period of 28 days, the time required for the skin to renew itself through natural cellular metabolism.

*15 Manufactured by Courage + Khazaka Electronic Gmbh.

*16 "Skin age" is an indication of the level of skin aging, for example, the degree to which the skin is firm and healthy looking, etc., expressed in number of years, and is used as guideline for skin care.

3) Improves skin texture*14

Test subjects used a Plasmacluster Ion generator on a daily basis only upon retiring at night. After 28 days of use (the time required for the skin to renew itself through natural cellular metabolism), the condition of the skin underneath the outer corner of the eye was examined by microscope. As a result, it was confirmed that skin texture improved after use of the Plasmacluster Ion generator. (Figure 6)

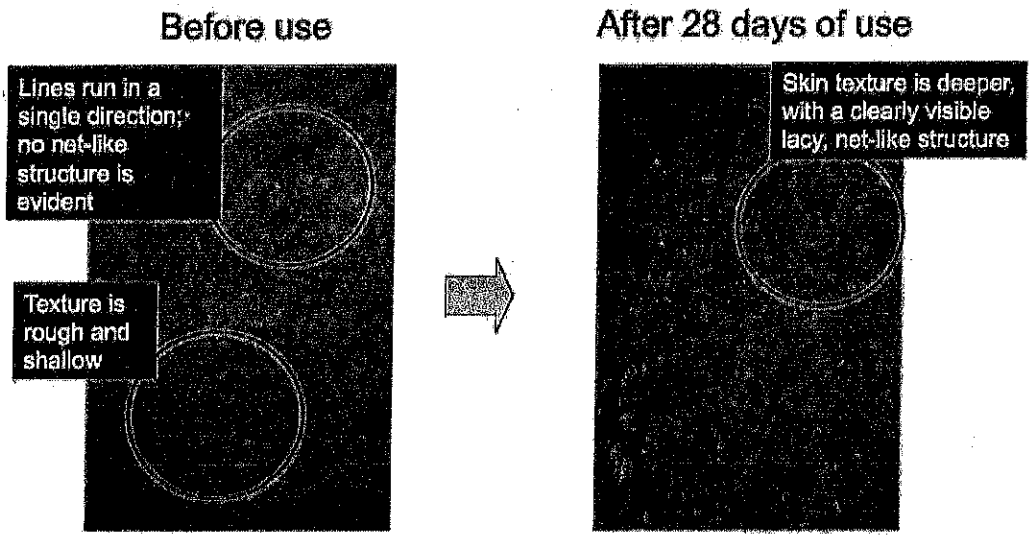


Figure 6: Example of change in skin condition (30X photomicrograph)

In addition, an opinion questionnaire using a Visual Analogue Scale (VAS) survey instrument*17 was administered to the 24 test subjects to elicit their subjective responses to the test.
As a result, statistically significant responses were obtained for items such as "The skin is moister," "Make-up goes on more smoothly and evenly," and "The skin feels soft" after the Plasmacluster Ion generator had been used, when compared to not having used the Plasmacluster Ion generator.

*17 A method employed in the medical field that uses numerical values to objectively evaluate subjective perceptions, such as the severity of pain.

Comment by Mr. Tomohiro Sugino, Representative Director of Soiken Inc.
Following on the skin moisturizing effect announced in February of this year, these current tests prove the effectiveness of Plasmacluster Ions in improving skin elasticity and skin texture. It is believed that these effects are the result of the skin being coated with water from Plasmacluster Ions. Based on this proof, Plasmacluster technology can be expected to be one measure for skin care.

About Soiken Inc.
Soiken was founded as Soiken Limited in 1994 and underwent reorganization to become Soiken Inc. in 2001. The company has since been developing businesses related to medical marketing support and providing specific health care advice related to lifestyle diseases, as well as conducting clinical trials of foods and devices, making use of its independently developed technologies for biomarkers and assay systems.

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.