

SEPTEMBER 2006

Technology Review



NEO PLASMA PLUS AIR PURIFYING SYSTEM

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009/06

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1. INTRODUCTION

With tighter building construction in recent years, the quality of indoor air has declined dramatically. The air circulating in the ductwork of the average home or office can be concentrated with biological contaminants including pollen, animal dander and other allergens, fungal and bacteria spores, bacteria and viruses. We fill our lungs up to 20,000 times inhalation each day. Over time, these contaminants can cause inflammation of the mucous membrane, upper respiratory problems, asthmatic conditions, headaches and flu-like symptoms. Purification and filtering systems offer little or no help because these airborne contaminants either pass through the filter or simply collect on the filter medium, creating a breeding ground. The filtration of microorganisms is a topic that requires special focus because of the unique characteristics of both filters and airborne pathogens in the submicron size range. (Kowalski and Bahnfleth 2002)

A South Korean company LG claims that its new generation air conditioner that could eliminate airborne viruses, including the bird influenza H5N1 and the common cold, also known as the human influenza H3N2, through multiple filters and a self-cleaning function in their latest Neo Plasma Plus Air Purifying System. (Lim 2006)

The H5N1 virus is an airborne virus strain contagious to humans. The air conditioner produced by the company claim to use an acid extract of *kimchi* pickle cabbage and is able to kill the virus in the air using special material filters. (Brian 2006)

The LG Neo Plasma Plus, which retails at 560 US dollars (RM2,075) costs much more than other air purifying system.

2. TECHNICAL FEATURES

The Neo Plasma Plus System consists of five types of filters - the Pre-filter, the Triple Filter, Nano Carbon Ball (NCB) filter, Plasma Filter and *kimchi* Avian Flu Filter (K-AVF). *Kimchi* is a spicy fermented vegetable dish made with red peppers, radishes and lot of garlic and ginger.

The pre-filter consists of nano silver that basically gets rid of allergens, moulds, mites as well as dust particles. It consist of three different organic compound filters, the triple filter which removes odours, volatile organic chemicals (VOCs) as well as formaldehyde, one of the causes of new house syndromes and prevent dermatitis, vomiting and pneumonia.

The NCB filter then removes odorous particles such as fishy smell, foot stink and smoke through highly absorbent system made up of nano carbon balls. The air then passes through LG's patented Plasma filter that removes microscopic contaminants, house mites and pollen.

Finally, the air passes through the K-AVF filter coated with *Leuconostoc citreum* which is said to be able to kill the viruses, through a complex four chemical sterilizer that is made up of extracts of **kimchi**, nano silver zeolite, Houttuynia (a natural anti-virus agent) and the bacteria and germicide inhibitor Triclosan (TCS). The developed air conditioner with Neo-Plasma Plus technology was to encounter most bacterial diseases and are effective against the Bird Flu epidemic virus. The air conditioner is fitted with K-AVF filter that helps to kill influenza H5N1 virus. (Cho Jin-seo 2006). Comparatively the conventional methods can merely inactivate external cell walls. The breakthrough K-AVF filter works by allowing their Nano Size bio-enzymes (Nano-Silver Zeolite), TCS to directly penetrate through cell wall to decompose its cell nuclei and kill the virus, thereby giving sterilized and purified air.

The Auto Clean function also keeps the air conditione in tip-top condition and requires no servicing for the first 18 months of use. LG claims that customers save approximately RM 150 on maintenance cost per air conditioner. (Lim 2006)

3. OBJECTIVE

To determine the effectiveness and safety of the Neo Plasma Plus air purifying system.

4. METHODOLOGY

Retrieval of evidence – An electronic search using the following search engines and data bases were carried out :- PubMed, Ebsco, Cinahl, Embase and Cochrane.

The following keywords were used in carrying out the search which includes : Anti Bird Flu air conditioners, Neo Plasma auto clean air, High Efficiency-Particulate-Air (HEPA) Filter, PE and FOAM Filter, Bird Flu bust air conditioner, **kimchi** air cond kills bird flu virus, Air Sterilizer non thermal air cleaning technology, **kimchi** *Leuconostoc citreum* anti Avian Bird Flu and Lactic acid *Leuconostoc citreum* microbes.

5. RESULTS AND DISCUSSION

Analysis of evidence – Interpretation and conclusion of diagnostic laboratory in vitro testing and other supportive clinical or industrial findings was directly contributed by the company and no other established studies and sources were available.

5.1 Effectiveness

There was no evidence found regarding the effectiveness of the technology. The only data available was provided by the company. The laboratory screening tests conducted by the company shows that the use of high efficiency filters have a greater than 90 per cent filtration rate which can produce air quality improvements that was almost equivalent with High Efficiency Particulate Arrestance (HEPA). They can remove all particles of size 0.3 microns. The use of these *kimchi* Avian Flu particulate enzyme (K-AV PE), K-AV Foam and K-AV HEPA filters was effective to kill viruses in *in vitro* applications. The company laboratory analysis suggested that the use of these filters attached in split air conditioners have a 'sterilizing enzymatic mechanism value' because it can kill and deactivate H5N1 virus using these high efficiency filters (Kowalski 2002 and Orac 2006)

However there was no established studies to prove that the application of the *kimchi* extracts in the Neo Plasma system totally eliminate the Avian Flu viruses either in vitro or in general set-up.

No scientific evidence was found on effectiveness of this technology.

5.2 Safety

There was no evidence found on the safety aspect of this technology. However, anecdotal evidence from the company claimed that the appliances are safe during installation, usage and maintenance. It can easily be installed in domestic households, office and industrial areas which are comparable with other brand of split air conditioners.

6. CONCLUSION

There is no evidence to support neither the effectiveness nor the safety of Neo Plasma air conditioners in killing Avian Bird Flu virus. Further research needs to be done to show the efficacy, effectiveness and safety of this air conditioning system.

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