Antimicrobial Systems

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Functional materials and nanomaterials for application in health and environment

Editor of Chemical Engineering Journal;
Scientific and editorial board member of international journals and conferences;
More than 150 publications, More than 300 conference papers; 50 plenary, keynotes and invited talks.
11 Inventions with 30+ patents.
Grant reviewer for UK-EPSRC, European-ERC/Framework6/7, Singapore-A Star
U.S.-Small Business/Petroleum Research Fund

Hong Kong

Each year, about one billion people worldwide suffer from influenza infection with fatalities reaching half a million. These figures will further increase whenever a new strain of virus emerges…

Stopping disease transmission is therefore critical for individual and community health...

Smart Anti-Microbial Coating

Simple and easy to use

Simple and easy to use

Fast and effective: rapidly inactivates and kills virus, bacteria and spores on contact

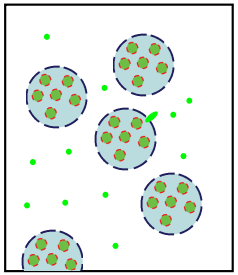
Long lasting: minimum 30 days in 1 application

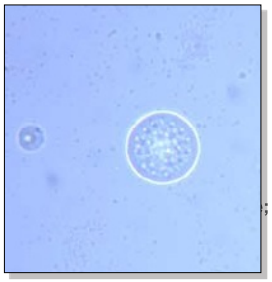
Smart : self-disinfect on touch and contamination

Safe and environmentally friendly

Smart Anti-Microbial Coatings

Anatomy of the Multilevel Anti-Microbial Formulation





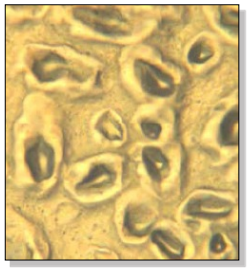
Simple and Easy to Use

Sprayed-on Formulation

↓

Coating on Surface

1000 x



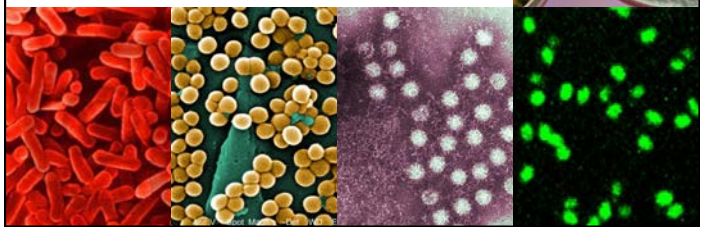
Fast and Effective

Sprayed-on Formulation

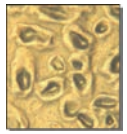
≥ 99.99 % within 1 min

Coating on Surface

Bacteria: 99.9 % within 1 min
Viruses: 99 % within 1 min
Spores: 99 % within 30 min



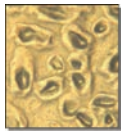
Long Lasting



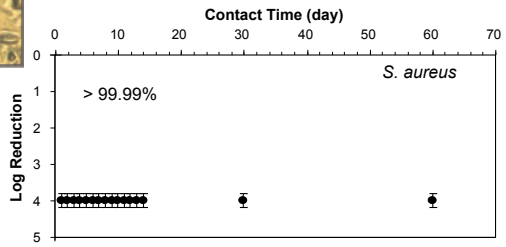
, $10^6.cm^{-3}$ *S. aureus*

Long Lasting

Minimum 60 days in single application

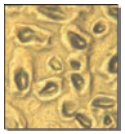


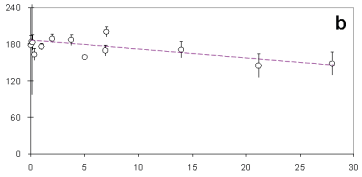
Effectiveness can be maintained for at least 60 days after coating



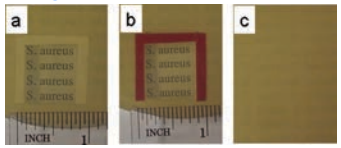
SMART

Persistent Release of Biocides



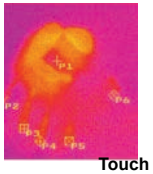


Disinfect up to 3 mm from coating

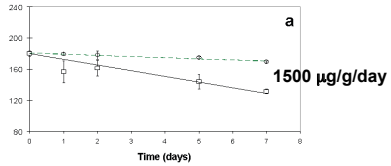


SMART

Rapid Self-disinfection

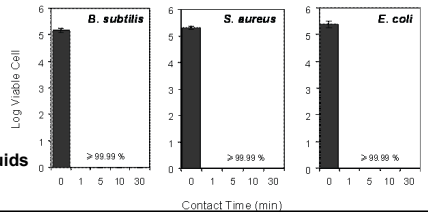


Touch



1500 µg/g/day

Body Fluids



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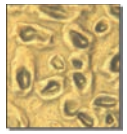
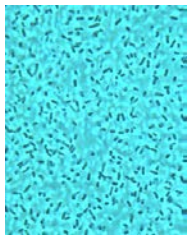
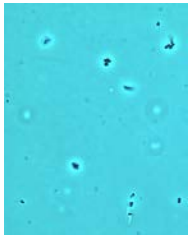
Self-Cleaning



The polymers used are anti-adherent tested for *E. coli* and *B. subtilis*



Without coating



With coating

E. coli

Field Test

January 2011

Queen Elizabeth Hospital | Princess Margaret Hospital | 屯門醫院 Tuen Mun Hospital

Smart Anti-Microbial Coatings

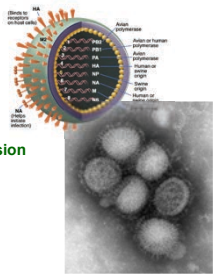
Virucidal Properties

No cytopathic activity after 1 min contact with coated plates…

HK Department of Health, Virus Division

99 % inactivation after 1 min contact with coated plates…

廣州呼吸疾病國家重點實驗室
廣州醫學院第一附屬醫院
廣州呼吸疾病研究所



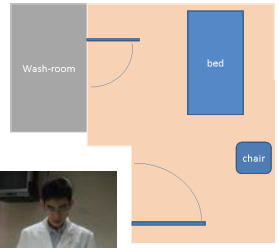
H1N1 human swine flu virus
H3N2, human RSV, EV-71

TMH Field Test

January 17 to April 12, 2011

Dr. T.L. Que
Dr. Eric Yip

屯門醫院 Tuen Mun Hospital



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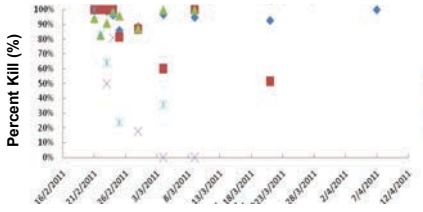
Field Test

Contamination by Touch

56 days



Challenge by touch (8 or 9 touches per item per day) with gloves contaminated with 0.1 ml 10^{10} CFU/cm3 *E. coli* with 3 min contact.

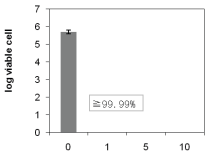
PMH Field Test

May 11 to 26, 2011

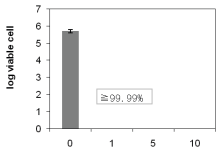
Dr. Ng
Dr. Bosco Lam
Princess Margaret Hospital

Objectives:
Coating efficacy and persistence against MDRO.

Lab tests against MDRO



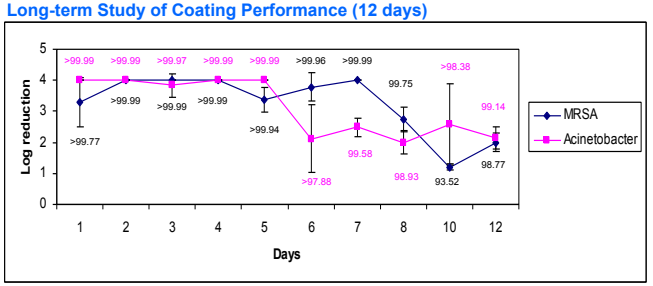
M-Pseudomonas



IMIpenem-Resistant ACInetobacter

Coating Efficacy

Long-term Study of Coating Performance (12 days)
Long-term Study of Coating Performance (12 days)



Challenged with 10^5 MDRO and sampling by swabbing after 10 min contact. Please note reduction is calculated against control surface without coating.

Clinical Field Testing (QEH)

January 17 to March 28 2011

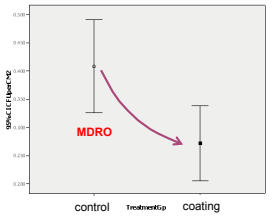
Dr. Dominic Tsang
Dr. Chris Lai
Queen Elizabeth Hospital

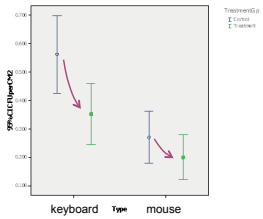
ICU computers

Clinical Field Testing (QEH)

January 17, 2011 (*on-going*)

Summary of 4 weeks study at ICU wards (>400 samples, >1200 analysis)





September 9, 2010 Press Conference