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Nano Anti-Microbial Solution

Advanced anti-bacterial and anti-virus technology

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Humans and Microbes

Bacteria and fungi play an essential role in the natural environment. They can degrade dead or discarded materials back to nature. In real life, people inevitably come into contact with various microorganisms such as bacteria and fungi. On the surface of human skin, the number of normal bacteria and fungi is 100 to 1,000 per square centimeter. Within this number range, they will not endanger human health or produce any odor. However, in daily life, human activities provide the best breeding place for microorganisms. Bacteria will multiply by tens of thousands without people paying attention, and may double every 20 minutes. The metabolism of microorganisms will produce bad odors and even infect humans to cause disease and death.

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The War
between Humans and Microbes

Traditional disinfection and cleaning techniques have proven to be very effective in killing harmful pathogens (bacteria, fungi, viruses, etc.) in the laboratory, but most of these techniques are fast and short-acting. At present, in most places, the frequency of disinfection and cleaning is far from the degree to completely inhibit the growth of bacteria.

The busy work and toxic disinfection chemicals make the disinfection work can only be operated in the gaps between daily operations, and the disinfection staff will occasionally cause some omissions under the pressure of time and tasks. These reasons cause the undesirable public health disinfection results in practice. Hospitals are undoubtedly one of the most polluted areas.

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Serious Challenges

Infections and infectious diseases are a continuous threat to human health. According to the European Centre for Disease prevention and Control (ECDC), over 4 million people are estimated to acquire a HealthCare Associated Infection (HCAI). The number of deaths occurring as a direct consequence of these infections is estimated to be at least 37 000, and these infections are thought to contribute to an additional 110 000 deaths each year. In February 2015, the European Commission released a progress report on the 5 year action plan against the rising threats from Anti-Micriobial Resistance (AMR) that was initiated in 2013. Key actions are focussed on an appropriate use of antimicrobials, effective prevention of microbial infections, development of effective antimicrobials (antibiotics) or alternatives, e.g. Anti-Microbial nano Coating system (AMC) , joining forces with international partners, and reinforcing research to combat AMR in an innovative way.

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Close Contacts and Infection

Whether it is influenza, SARS, MERS or the Wuhan coronavirus 2019-nCov, most of the transmission occurs between close contacts, and there are very few cases of all infections just by taking the same taxi or the same aircraft. There have been multiple reports of collective outbreaks living in the same hotel floor or in the same residential building during the SARS epidemic. This evidence proves that when carriers of pathogens continue to increase the virus concentration (air or surface) in the area, they will eventually lead to cross infection.The hand used to stop the cough droplets may press the elevator button. Few people will wash their hands immediately after using the hotel elevator or facilities. Some people may touch their noses, eyes, or even eat directly with their hands, which has led to exposure to deadly pathogens. Even wearing a mask in this case will not provide protection.

Therefore, the anti-virus and anti-bacterial coating system (AMC) is a very potential technology to deal with such cases of outbreaks caused by close contact, because the virus's transmission process in vitro may be blocked and the risk of infection will be restricted.

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How to improve the level of public health and disease prevention?

Increase the frequency of disinfection

Such measures can reduce the risk of cross-infection in public health. For example, after the SARS epidemic, the Hong Kong MTR Corporation kept the disinfection every 4 hours as a routine procedure. However, measures that are limited by cost and actual operating environment are not suitable for many occasions.

Advanced antibacterial and antiviral hygienic surface

Now we can provide high-performance antibacterial and antiviral hygienic surfaces to the entire space through advanced surface coating system and treatment technology, thereby assisting traditional disinfection to achieve higher standards, reducing hospital cross infections, and protecting patients and medical staff.

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The world is in action

American Journal of Infection Control

Brief report:

Lower infection rates after introduction of a photocatalytic surface coating

John R. Pulliam MBA, LNHA*

Table 1
Average infection rates by CDC-defined category* and in total, comparing the 12 months prior to and the 12 and 17 months after introduction of a photocatalytic coating

	12 months prior	12 months post		17 months post	
CDC category*	Rate	Rate	P value	Rate	P value
GI	0.36	0.33	.86	0.30	.53
SST	1.02	0.77	.19	0.91	.54
BSI	0.03	0.02	.56	0.04	.76
EENT	0.71	0.37	.11	0.35	.04
UTI	1.68	1.03	.08	0.98	.03
URI	0.22	0.05	.22	0.06	.16
LRI	0.53	0.65	.54	0.50	.84
All infection types	4.57	3.17	<.01	3.23	.02

BSI, blood stream infection; *CDC*, U.S. Centers for Disease Control and Prevention; *EENT*, eyes, ears, nose, and throat; *GI*, gastrointestinal; *LRI*, lower respiratory infection; *SST*, soft skin tissue; *URI*, upper respiratory infection; *UTI*, urinary tract infection.
*Rates are the average events per 1,000 patient days.

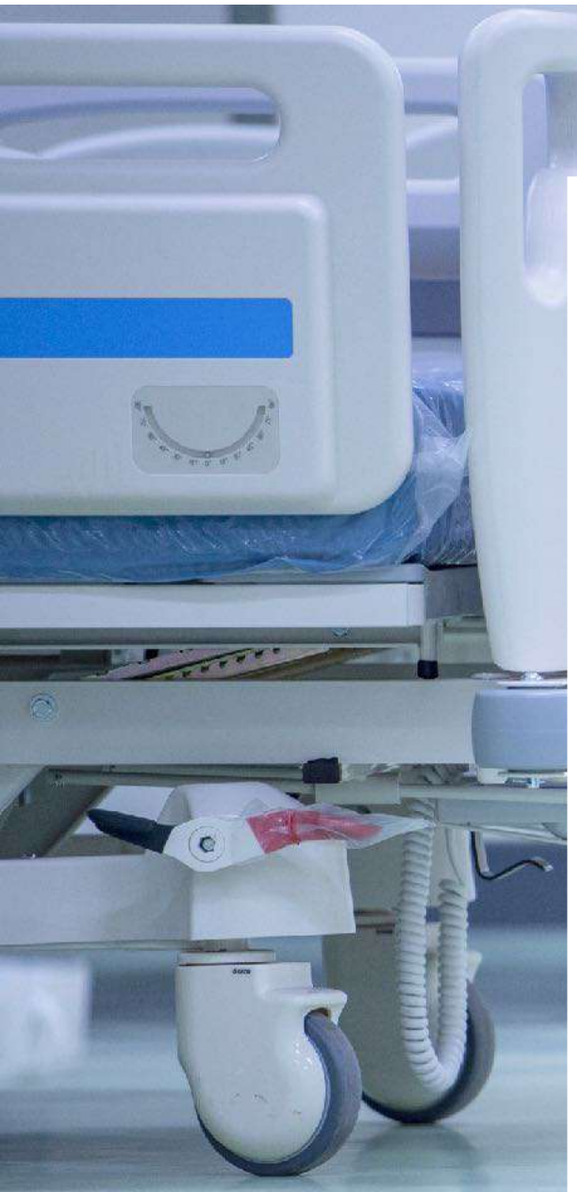
1.American Journal of Infection Control

As the official publication of the Association for Professionals in Infection Control and Epidemiology (APIC). AJIC is the foremost resource on infection control, epidemiology, infectious diseases, quality management, occupational health, and disease prevention. AJIC also publishes infection control guidelines from APIC and the CDC. Infection control professionals, including physicians, nurses, and epidemiologists, rely on AJIC for peer-reviewed articles covering clinical topics as well as original research.

In 2015, the AJIC [1] published a long-term research paper. Our US partner cooperated with Emory University in Atlanta and its affiliated Emory Healthcare Group [2] to using advanced hygienic surface technology. After 17 months of antibacterial and antiviral protection of one its affiliated hospital, the total cross infection rate of the hospital and the infection rates of different divisions in the hospital all showed a significant decreasing (P <0.05).

2. Emory University

Emory University has the 17th largest endowment among U.S. colleges and universities. It is ranked 21st nationally and 73rd globally according to U.S. News & World Report's 2020 rankings.
Emory Healthcare, part of Emory University, is the largest health care system in the state of Georgia. It comprises ten hospitals, the Emory Clinic and more than 250 provider locations.



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AMiCI
Innovative coating solutions to prevent infectious diseases

ABOUT AMICI

AMiCI stands for Anti-Microbial Coating Innovations to prevent infectious disease. This COST action aimes to evaluate the impact of AMC in healthcare.

cost
European Cooperation in Science and Technology

The world is in action

The AMICI-consortium [1] is convinced that new methods, in addition or as an alternative to an appropriate use of disinfectants and antibiotics, are required to reduce microbial activity, associated infections and the increase of AMR. There is an urgent need for the European Commission to expand their investments in these alternatives. A potential and promising weapon against bacterial growth and possibly the development of multi-drug resistant bacteria has been found in AntiMicrobial (nano)-Coatings (AMC).
Our partners in Europe participated in the AMICI research project, conducted basic research in several medical institutions and sites, and tapped the potential of AMC for infection risk control.

1. **AMICI Consortium**
   With the support of the COST [2], the scientific research institutions of EU member states form the AMICI consortium.
2. **European Cooperation in Science and Technology「COST」**
   COST Action is a network dedicated to scientific collaboration, complementing national research funds. A COST Action is organized by a range of networking tools, such as meetings, conferences, workshops, short-term scientific missions, training schools, publications and dissemination activities. The average COST Action support is EUR 130,000 per annum for participation by typically 25 COST Members.

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The world is in action

Our technology has been successfully applied to the metro and suburban railway system in Budapest, Hungary. After nearly a year of follow-up testing, the overall bacterial counts by ATP meter has decreased by more than 90%. As a prominent public health achievement, this result was presented to the Health Ministers of participating countries at 3rd CEEC-China Health Ministers' Meeting [1] and its exhibition on June 19, 2017. The strategic cooperation agreement is signed under the witness of the Health Minister of China and the Economic Minister of Hungary to develop the Central and East European markets together.

1. 3rd CEEC-China Health Ministers' Meeting

On June 19, 2017, the 3rd CEEC-China Health Ministers' Meeting was held in Budapest. Deputy Prime Minister of China Liu Yandong and Deputy Prime Minister of Hungary Zsolt Semjén attended the opening ceremony and delivered speeches. With the theme of "Promoting the Health of All People", the Meeting issued the "Budapest Declaration of the 3rd CEEC-China Health Ministers' Meeting".

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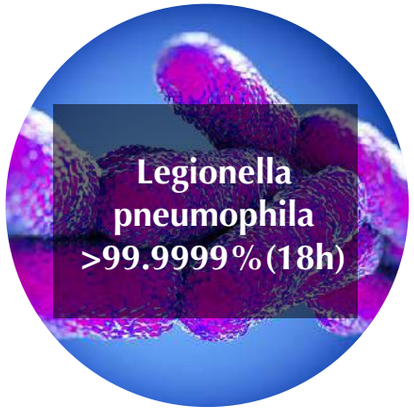

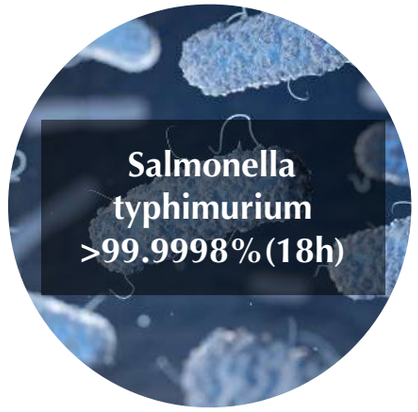

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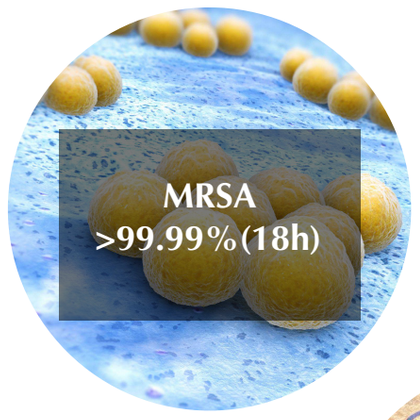

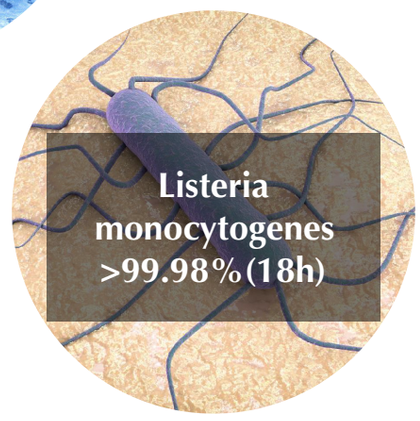

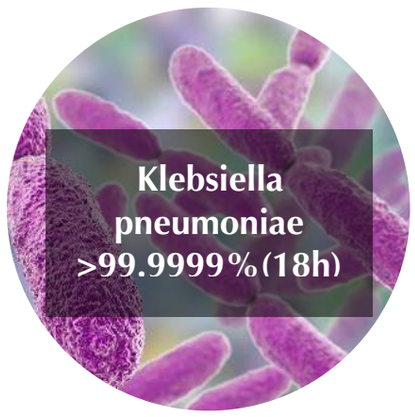

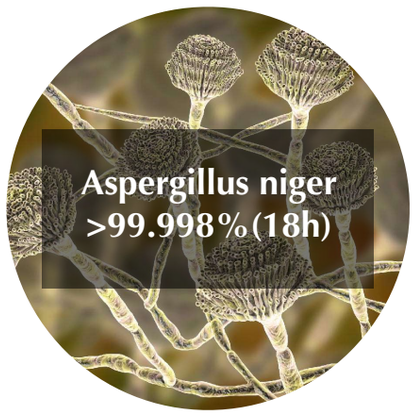

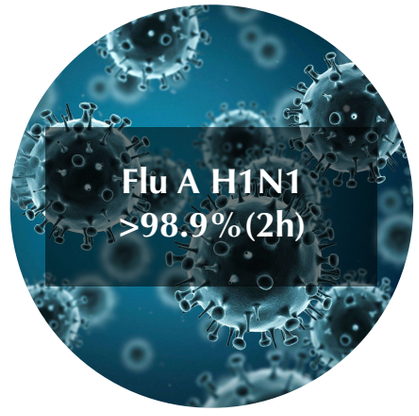

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Escherichia Coli

>99.9999%(18h)

Most E. coli are not pathogenic, but some serotypes can cause severe food poisoning or food contamination.

Escherichia coli is often used as ***a sign of fecal contamination***

E. coli, which is generally harmless to the human body, can also cause disease in the following situations:

When bacteria leave the intestine and enter the ***urinary tract can cause infections****.*

When bacteria enter the abdominal cavity due to perforations such as ulcers, it usually causes ***a fatal peritonitis infection****.*

Some strains of E. coli are toxic (some of which are similar to toxins that cause dysentery), can cause food poisoning, and the severity of the disease can be much different, especially ***fatal to children, the elderly and immunocompromised patients****.*

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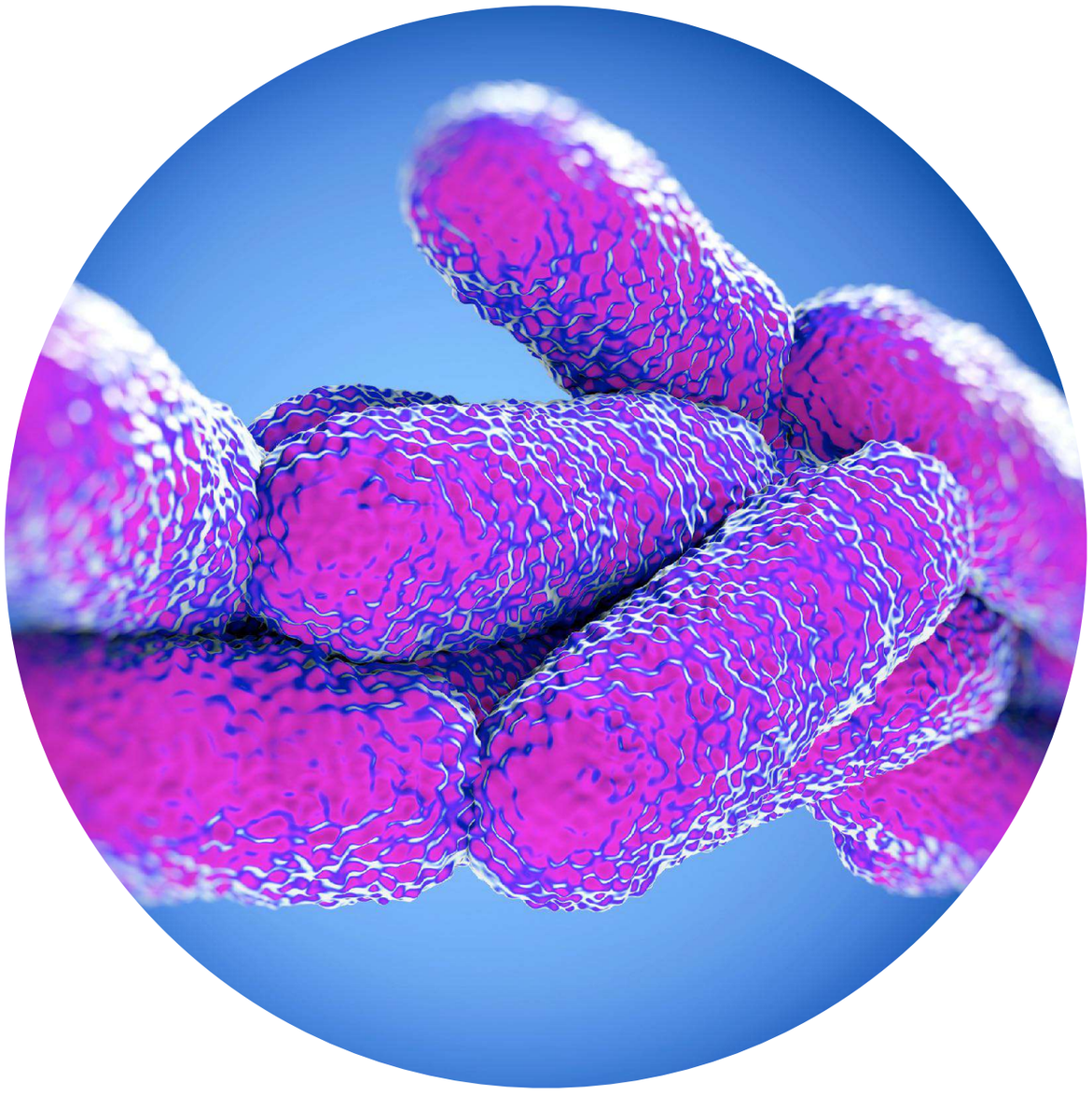
Legionella pneumophila



>99.999%(18h)

Legionella is a kind of Gram-negative bacteria. It is Legionella pneumophila that causes ***Legionnaires' Disease****.*

Legionella is aerobic and can survive for a long time in nature. For example, it can survive for more than 100 days in distilled water and one year in sewage.

In 1976, a veterans conference was held in Philadelphia, Pennsylvania, USA. More than ***200*** *of the participants had pneumonia, and* ***34 of them were dead****. It was found that the culprit of the incident was a bacteria that had not been found at the time-****Legionella pneumophila*** *(the disease was therefore named Legionnaires' Disease). This incident reflects that Legionella pneumophila is not a small-scale human-to-human transmission.*

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MRSA

>99.99%(18h)

*Methicillin-resistant Staphylococcus aureus or Multidrug-resistant Staphylococcus aureus is a unique strain of Staphylococcus aureus that is resistant to almost all penicillin-type antibiotics, including methicillin and other beta-lactamase-resistant penicillins. MRSA was first discovered in the United Kingdom in 1961 and is now widely disseminated as "**Superbugs**".*

In the past, staphylococci only caused infections in the skin or wounds. However, due to excessive use of antibiotics, S. aureus strains have developed resistance. Even without a wound can also lead to drug-resistant Staphylococcus aureus infections. Symptoms can be rampant and even necrotizing fasciitis.

***MRSA** infections often originate in hospitals or gyms.*

***Staphylococcus aureus** is generally planted in the anterior foramen, which may infect the skin and soft tissues of the respiratory tract, wounds, venous catheters and urethra, causing abscesses, redness, fever and pus.*

*It is reported [1] that among all hospitalized patients, the average length of hospital stay of patients infected with **MRSA** is three times that of other patients, and the mortality rate is five times that of other patients.*

1. Arch Intern Med. 2005, 165: 1756–1761.

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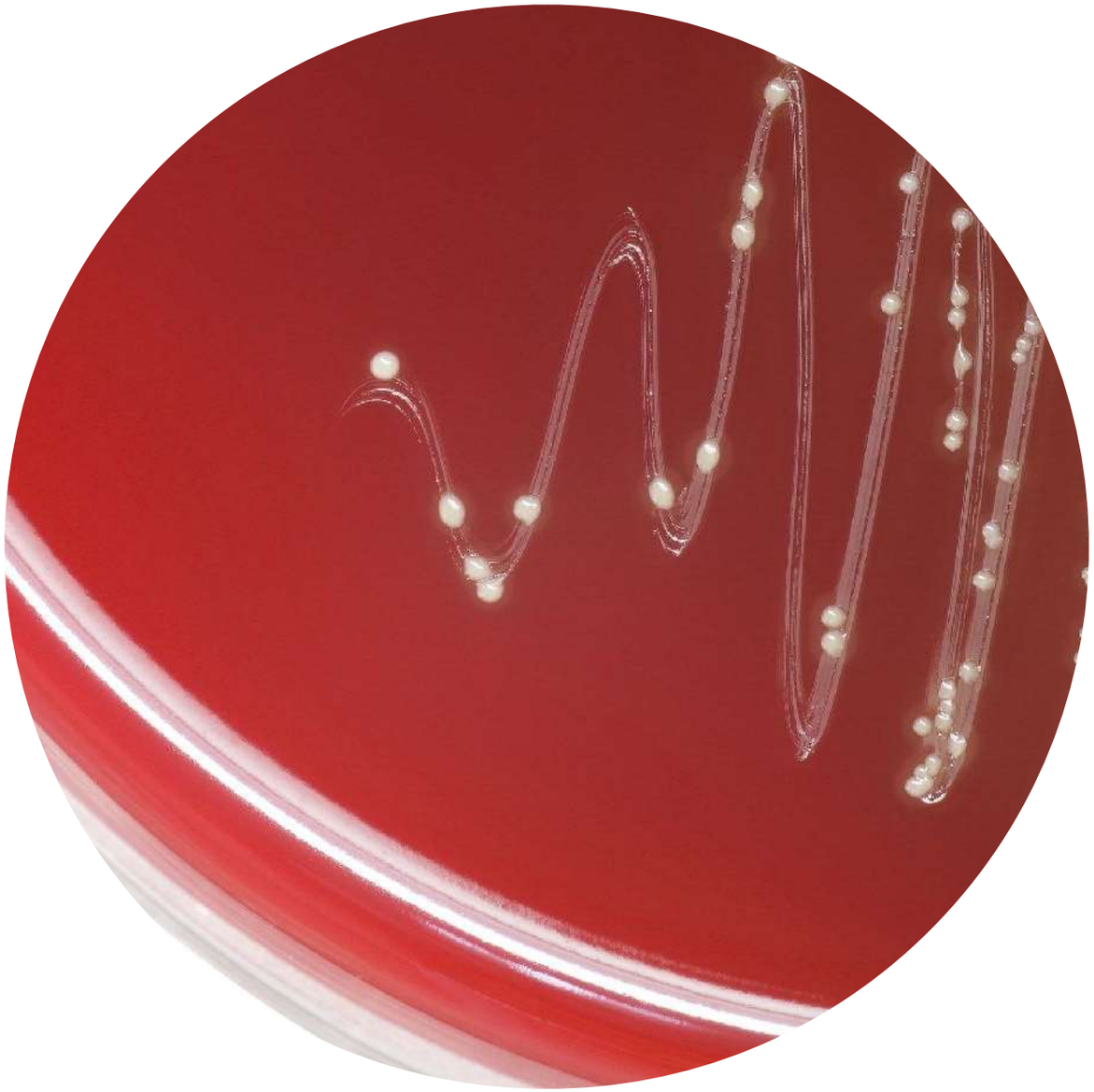
Hemolytic streptococcus



>99.9999%(18h)

Hemolytic streptococci *often cause infections such as tonsils, pharynx, and middle ears. It is also the pathogen of pyelonephritis, puerperal fever, and scarlet fever.*

Hemolytic streptococci *can often cause purulent inflammation of the skin and subcutaneous tissue, respiratory infections, outbreaks of epidemic pharyngitis, and neonatal sepsis, bacterial endocarditis, scarlet fever and rheumatic fever, and allergic reactions such as glomerulonephritis .*

Hemolytic streptococcus *is widely distributed in nature. It exists in water, air, dust, feces, and the oral cavity, nasal cavity, and throat of healthy people and animals. It can be transmitted through direct contact, air droplets, or through skin and mucosal wound infections. Contaminated foods such as milk, meat, eggs and their products can also infect humans. Patients with upper respiratory tract infections and human and animal purulent infection sites often become a source of food contamination.*

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Klebsiella pneumoniae

>99.9999%(18h)

Klebsiella pneumoniae *is a member of the genus Klebsiella enterobacteriaceae, a gram-negative bacterium, rod-shaped, and coated with a large number of sticky polysaccharides. Klebsiella pneumoniae can cause infectious diseases such as pneumonia, urinary tract infection, bacteremia, etc. in humans, especially individuals with low immunity. The infections are more common* ***in hospitals****. However, in addition to hospital infections,* ***community-based infection*** *also gradually increased.*

Klebsiella pneumoniae *is highly pathogenic to humans and is one of the important conditional pathogens and iatrogenic infections. In hospital-infected sepsis, this bacterium is one of the important pathogenic bacteria with a high mortality rate.*

Recent studies in the medical community have found that, because this bacterium is very susceptible to mutation, it is more resistant to drugs, and its harmfulness to human health has also increased year by year.

In the community, the carrier rate of Klebsiella pneumoniae in fecal specimens was between 5% and 38%, and between 1% and 6% in the nasopharynx. ***The carrier rate in hospitalized patients increased significantly****, and the fecal carrier rate was 77% The pharyngeal infection rate was 19% and the hand infection rate was 42%.* [1]

1. Clin Microbiol Rev. 1998;11(4):589.

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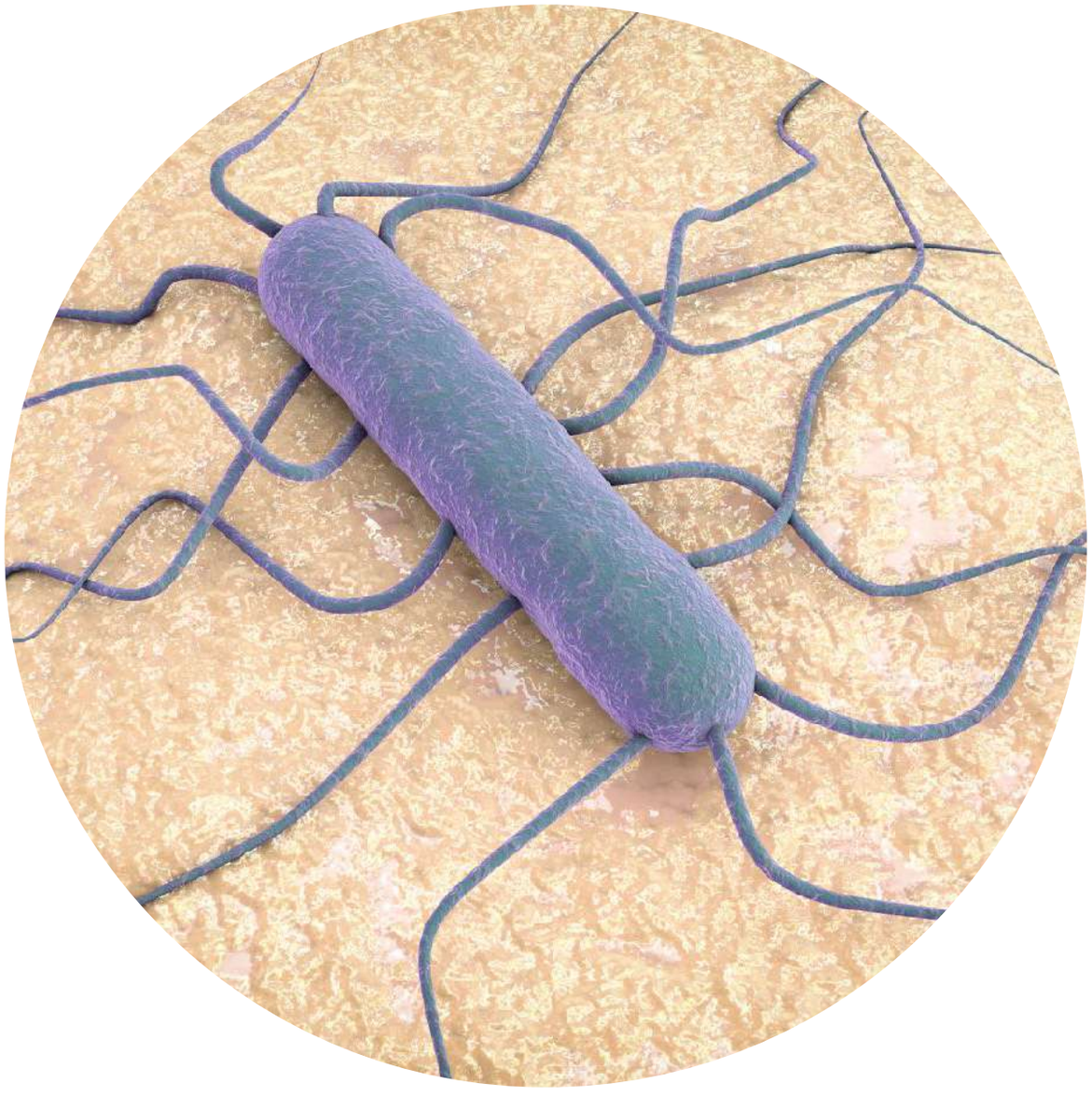
Listeria monocytogenes



>99.98%(18h)

***Listeria monocytogenes**, also known as **Listeria**, is a facultative anaerobic bacterium and is the pathogen of Listeria monocytogenes. It mainly uses food as a vector and is one of the most deadly foodborne pathogens, causing 20 to 30% of infected people to die1. Listeria causes approximately 2,500 cases and 500 deaths each year in the United States. Listeria is the main cause of death, and its fatality rate is even higher than Salmonella and Botox.*

Listeria infection can cause a range of symptoms including: pneumonia, fever, sore throat, diarrhea, general pain, meningitis, septicaemia, and death in severe cases. Listeria infections mostly occur in newborn babies, the elderly, the physically and mentally disabled, and the immunocompromised. Listeria infections in pregnant women can cause miscarriages and stillbirths.

1. J Microbiol Immunol Infect. 40:4-13.

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Salmonella typhimurium

>99.9998%(18h)

Salmonella enterica *is a group of non-adaptive or pan-tropical Salmonella with a wide range of hosts, and it is one of the most isolated strains in various countries in the world. The bacterium can cause a variety of infectious diseases of poultry and mammals, and can also cause human infection, which has important public health significance.*

Salmonella typhimurium*, an important member of Salmonella enterica, is one of the main pathogens that cause acute gastroenteritis.*

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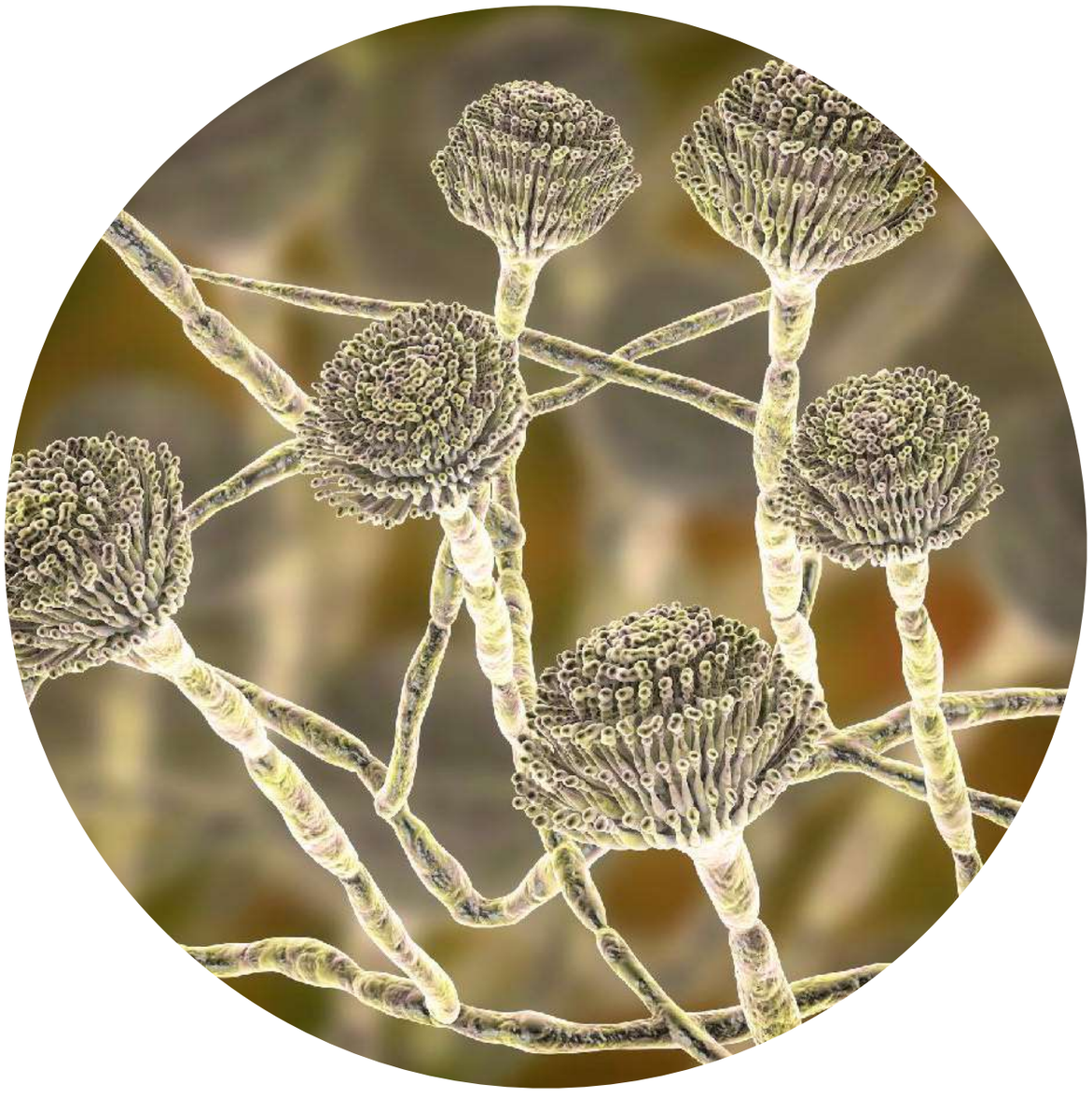
Aspergillus niger



>99.9998%(18h)

Aspergillus niger *is widely distributed in food, plant products and soils all over the world, and can cause mildew of food and other industrial equipment.*

Aspergillus niger *is the most common isolate in normal human ear fungal disease. It can also cause deep fungal infections in immunocompromised patients and can cause fungal keratitis. In addition to causing Aspergillus niger, Aspergillus niger can also produce Aspergillus niger.*

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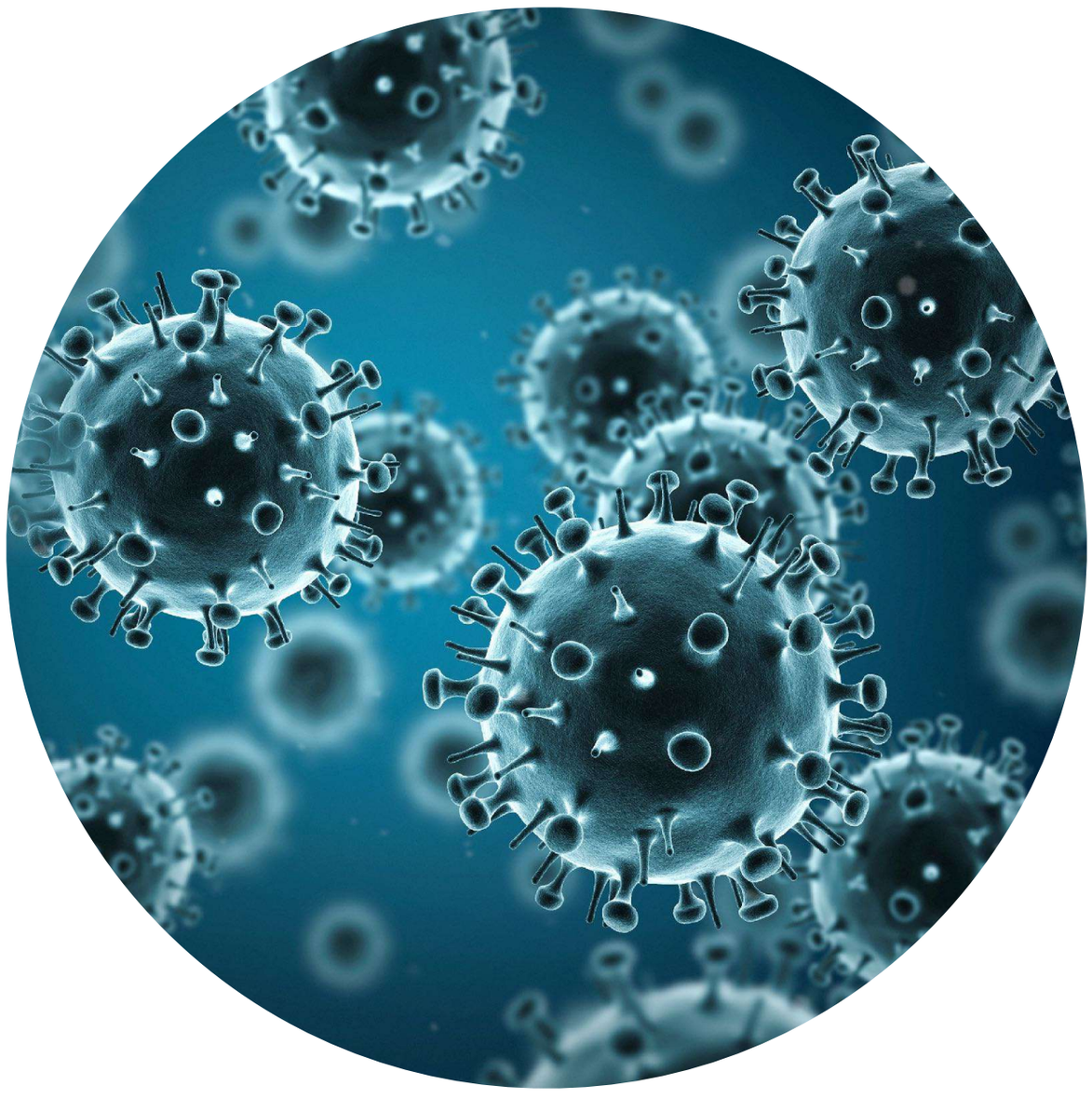
Influenza A Virus



>98.9%(2h)

Influenza A virus H1N1, *part of the Orthomyxoviridae family, is* ***a single-stranded RNA enveloped virus*** *ranging from 80-120nm in diameter.*

Some ***H1N1*** *species can be transmitted between humans, including the 1918 influenza pandemic, and others can be transmitted between birds and pigs.*

The novel H1N1 influenza A (also known as "swine flu") is a very highly contagious new influenza virus that has been reported many times in schools and university dormitories. In the United States, the virus was first discovered in April 2009. This influenza virus is a brand new species, so humans do not have a vaccine against it or have innate immunity. According to estimates from the United States CDC, as of mid-March 2010, the epidemic had affected 59 million Americans, infected 265,000 people, and died of 12,000.

H1N1 influenza virus can be transmitted through droplets and contact.

Human flu usually causes fever, cough, sore throat, muscle pain, conjunctivitis, and even severe cases of respiratory problems and pneumonia that can cause death. However, highly pathogenic H5N1 avian influenza can have very serious consequences for humans, with a lethal rate of 50% following infection.

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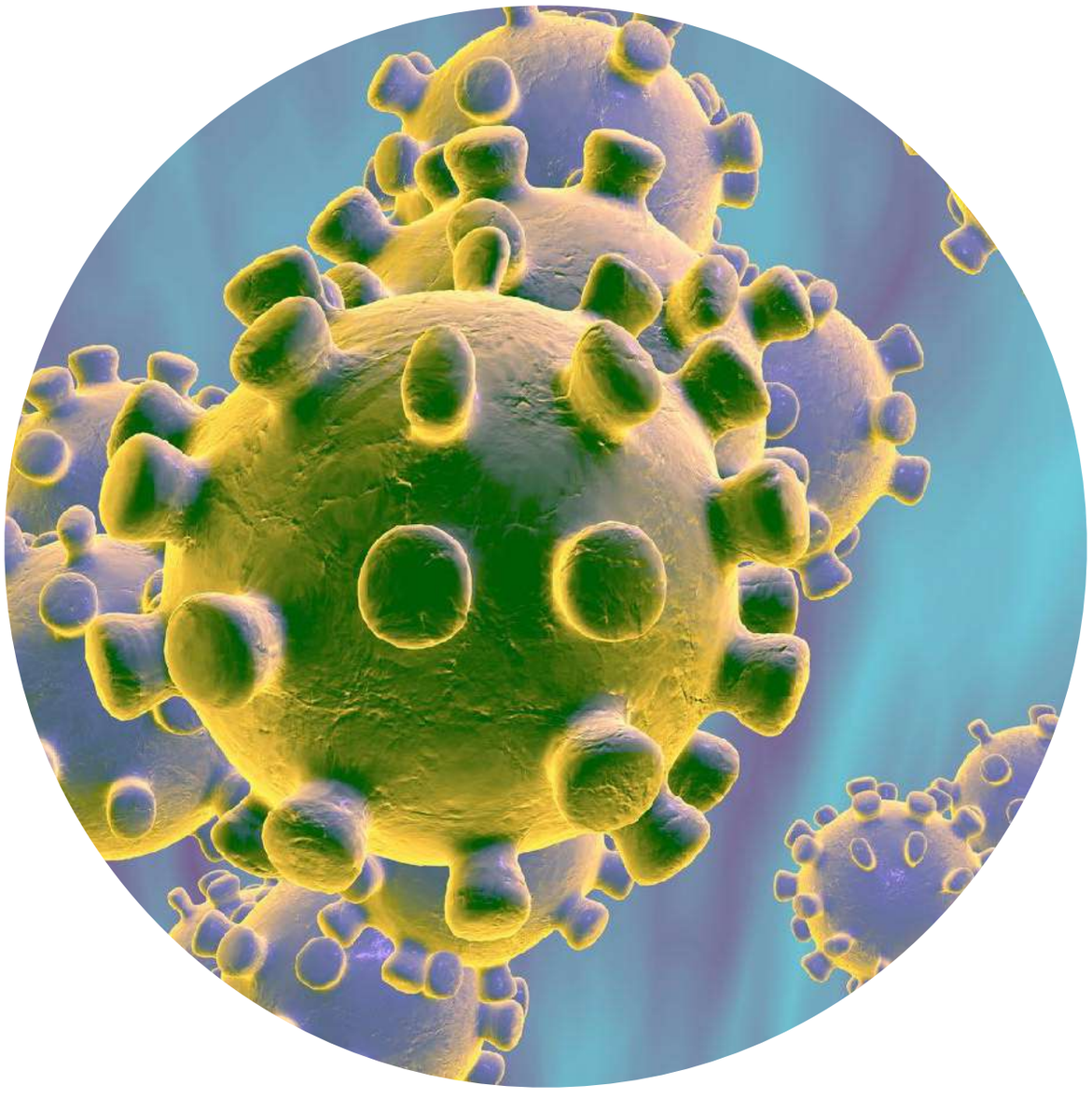
Corona Virus
SARS,MERS,2019-nCoV



>98%(2h)*

** Both influenza and coronavirus are enveloped viruses, and our antiviral technology is based on radical physical and chemical principles, although we cannot perform coronavirus laboratory tests due to the danger level of the SARS/MERS, according to the similar chemical structure of those viruses, The effect of our technology on coronavirus should be similar to that of influenza A.*

Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV), *part of the Coronaviridae family, is* ***a single-stranded RNA enveloped virus*** *100-140nm in diameter. SARS-CoV is associated with severe pneumonia, acute respiratory distress and has a high risk of a fatal outcome (10% morality rate). SARS-CoV was first identified in 2003 when an epidemic commenced in China, where it was thought to be spread from small mammals (most likely bats) to humans. SARS can be spread by inhaling small droplets of nasal secretions, via direct contact with an infected person.*

Middle East Respiratory Syndrome Coronavirus *(MERS-CoV): Like SARS-CoV, MERS-CoV is part of the Coronaviridae family, but seems to have originated in Saudi Arabia in 2012. It is believed to have originated in bats, with camels suggested as a possible intermediate host. MERS-CoV causes similar symptoms to SARS-CoV including acute respiratory distress, but has a higher mortality rate (around 30%). The route of transmission is thought to be similar to SARS-CoV, primarily via respiratory droplets, but transmission via the oral route or via urine cannot yet be excluded.*

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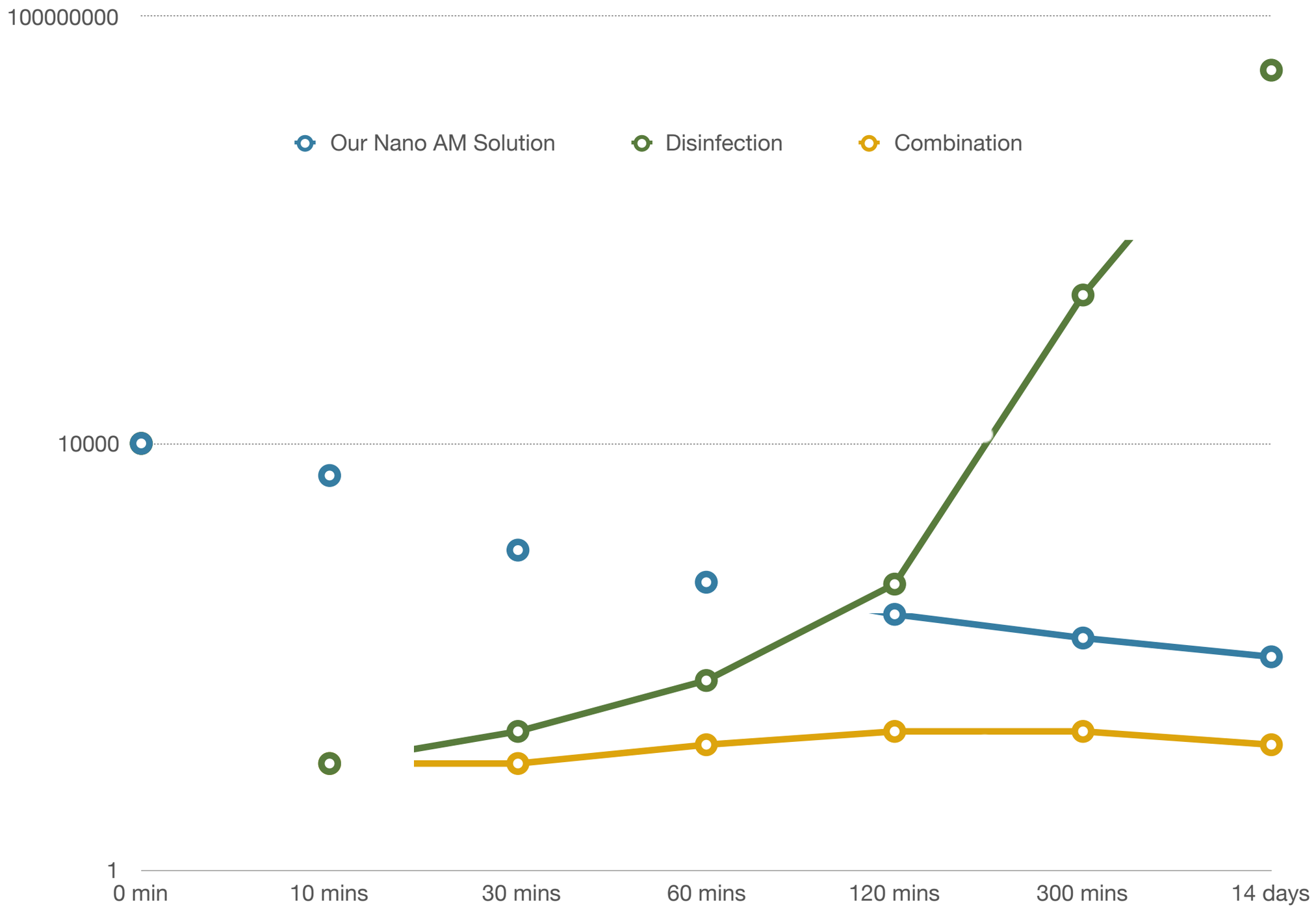
SURFACE BACTERIA COUNTS CHANGES COMPARISON



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ANTI-MICROBIAL DATA

Anti-bacterial test of sample coated by AG-Series nano sol for healthcare industry

Test Organism	Low light condition during the test		
	Concentration of Inoculums (CFU/ml)	Bacteriostatic activity value 24 hours	Bacteriostatic rate (%)
MRSA ATCC 33591	1.1×10^5	6.1	>99.9999%
Escherichia coli ATCC 8739	1.7×10^5	6.6	>99.99997%
Listeria monocytogenes 54001	2.7×10^5	3.8	>99.98%
Legionella pneumophila ATCC 33152	2.3×10^5	5.2	>99.999%
Salmonella typhimurium AS 1.1194	1.3×10^5	5.8	>99.9998%
Hemolytic streptococcus CMCC 32213	1.2×10^5	6.2	>99.9999%
Klebsiella pneumoniae ATCC 4352	2.9×10^5	6.3	>99.9999%

ISO 20743:2013 / JIS L1902:2008

Certificated by SGS Group

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ANTI-MICROBIAL DATA

Anti-bacterial test of sample coated by AG-Series nano sol for food industry

Test Organism	Low light condition during the test		
	Concentration of Inoculums (CFU/ml)	Bacteriostatic activity value Coated Sample (Log)	Bacteriostatic activity value Control Sample (Log)
Listeria monocytogenes ATCC 19114	1.3×10^6	5.31#	0.52
Escherichia coli ATCC 8739	7.5×10^6	6.26	-0.06
Salmonella typhimurium ATCC 14028	7.1×10^6	6.08#	0.14
Staphylococcus aureus ATCC 6538	8.6×10^6	6.15#	0.56
Bacillus cereus ATCC 11778	5.4×10^5	5.08#	0.96
Leuconostoc mesenteroides DSM 20343	1.1×10^7	2.68	0.19
Pseudomonas putida DSM 50198	1.7×10^6	5.58	-0.06
Lactobacillus brevis DSM 6235	8.4×10^5	5.50#	0.40
Zygosaccharomyces bailii CBS 10063	1.1×10^6	2.80#	0.19

= No bacteria detected

ISO JIS Z 2801

TNO Certificated Lab

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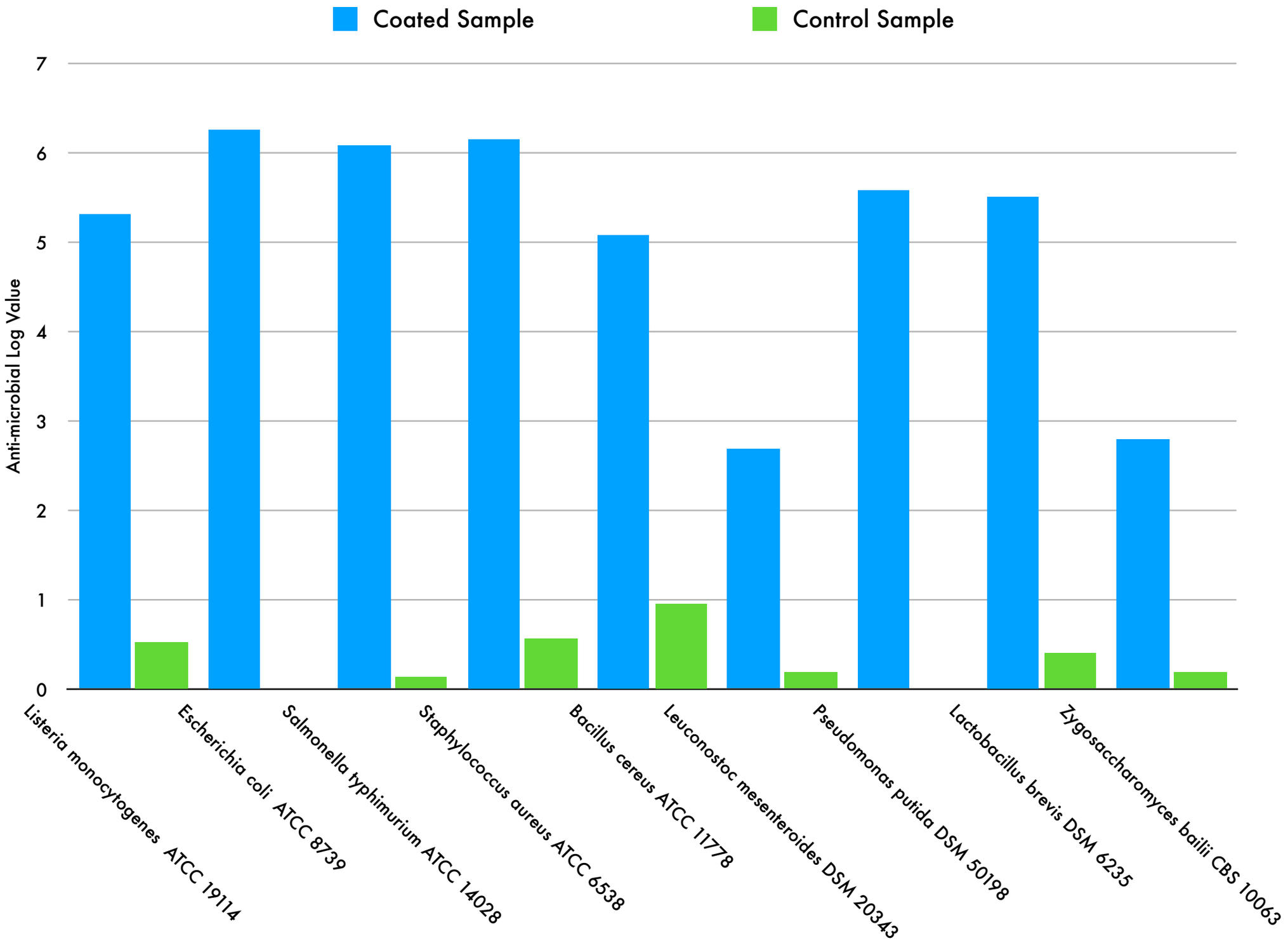
ANTI-MICROBIAL CHART

Anti-bacterial test of sample coated by AG-Series nano sol for food industry



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ANTI-VIRAL DATA

Short time (2h) Anti-viral test of sample coated by AG-Series nano sol for enveloped virus

Test Sample	Low light condition during the test		
	Concentration of Inoculums (CFU/ml)	Virus Reduction Rate(%) 2 hours	Anti-viral Rate(%) 2 hours
Influenza A virus H1N1 (ATCC-VR1469)	2×10^7	>98.9%	>95.1%

ISO 18184 : 2014
Certificated by SGS Group

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ANTI-MICROBIAL DATA

Anti-bacterial activity comparison for X-Series and AG-Series

Test Organism	Normal Light (X-Series) / Low Light (AG-Series)		
	Test Protocol	Bacteriostatic rate (%)	Bactericidal rate (%)
Escherichia coli (ATCC 25922) X-Series	GB 15979-2002#	/	>97.69
Escherichia coli (ATCC 8739) AG-Series	JIS L 1902:2008*	>99.9999%	>99.9%
Staphylococcus aureus (ATCC 6538) X-Series	GB 15979-2002#	/	>99.44%
Methicillin Resistant Staphylococcus aureus (MRSA) ATCC 33591 AG-Series	ISO 20743:2013*	>99.9999%	>99.9%

ISO 20743:2013 / JIS L1902:2008N*
Certificated by SGS Group

GB15979-2002#
Certificated by NATIONAL GUANGDONG DETECTION CENTER OF MICROBIOLOGY

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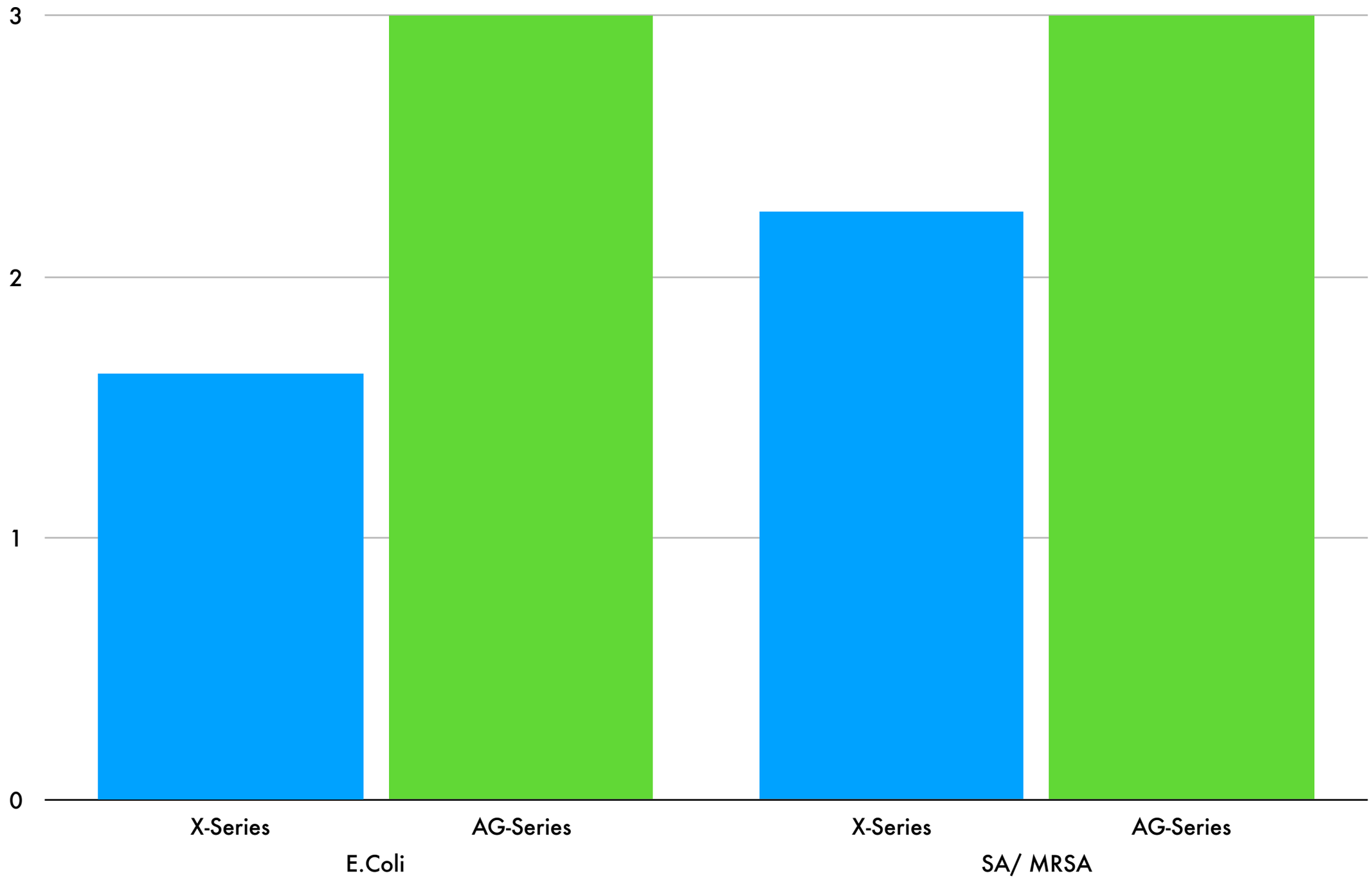
ANTI-MICROBIAL CHART

Anti-bacterial activity comparison for X-Series and AG-Series



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Nano Anti-Microbial Solution

ANTI-MICROBIAL DATA

Bactericidal test of ceramic tiles coated by X-Series nano sol

Test Organism	Irradiating by 40w fluorescent lamps during testing		
	0 Hour (cfu/piece)	24 Hour (cfu/piece)	Bactericidal rate (%)
Escherichia coli (ATCC 25922)	3.9×10^4	9.0×10^2	97.69
Staphylococcus aureus (ATCC 6538)	6.8×10^3	1.1×10^2	98.38
Pseudomonas aerugimosa (ATCC 9027)	2.8×10^5	84	99.97
Klesiella pneumoniae (ATCC 10031)	2.7×10^5	1.5×10^3	99.44

GB15979-2002

Certificated by NATIONAL GUANGDONG DETECTION CENTER OF MICROBIOLOGY

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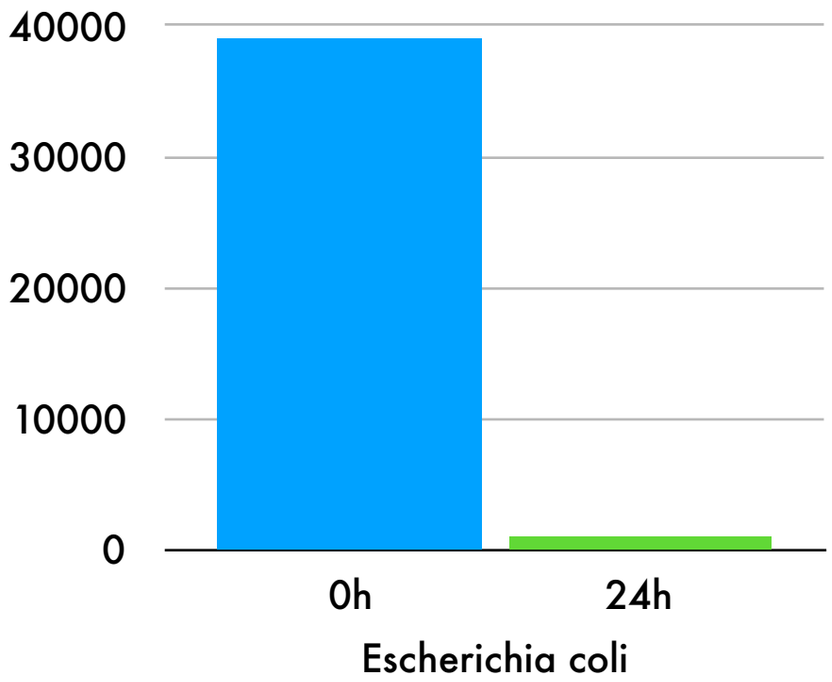
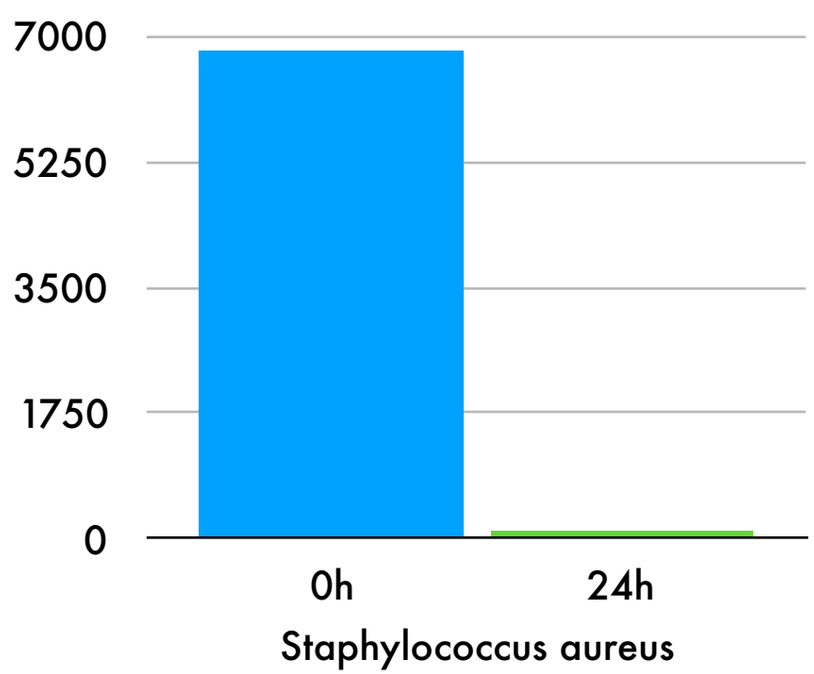
ANTI-MICROBIAL CHART

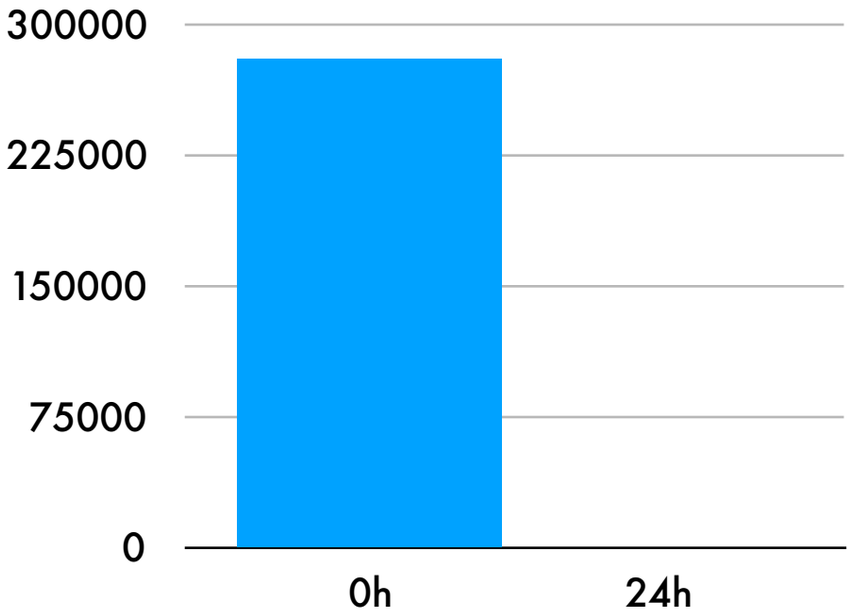
Bactericidal test of ceramic tiles coated by X-Series nano sol



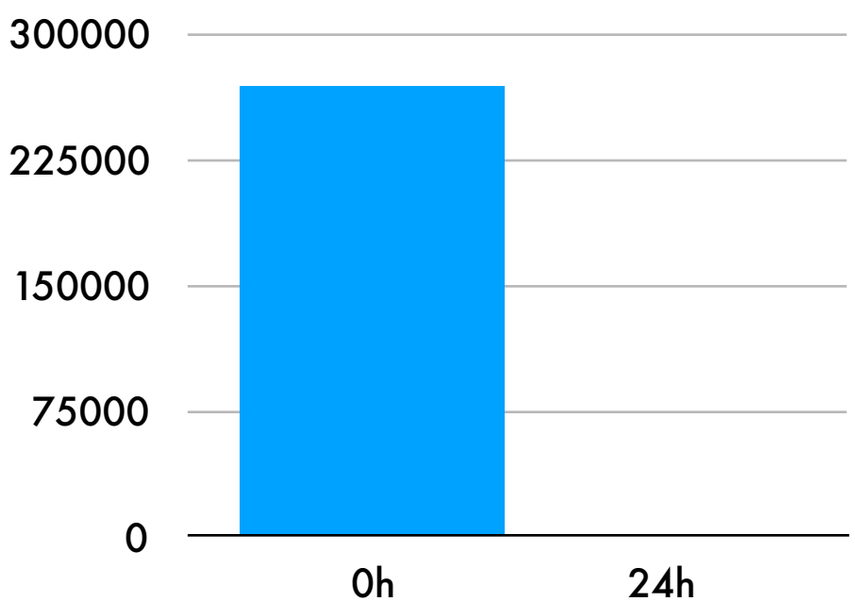
Escherichia coli



Staphylococcus aureus



Pseudomonas aerugimosa



Klesiella pneumoniae

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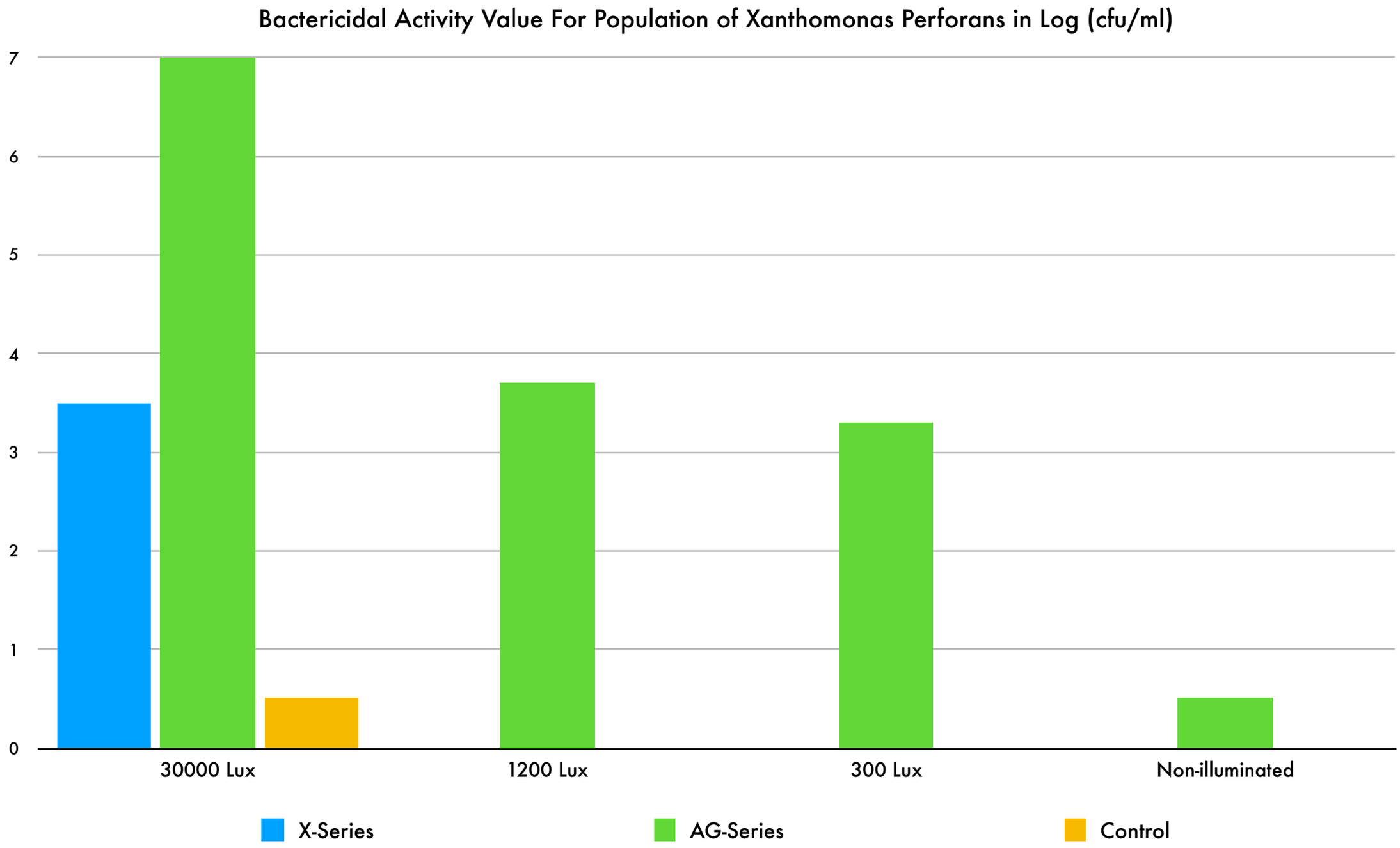
ANTI-MICROBIAL CHART

Anti-microbial activity under different light intensity (incandescent lamp / in 15 minutes)



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ANTI-MICROBIAL DATA

Anti-microbial activity under different light intensity (incandescent lamp / in 15 minutes)

Light Intensity	Test Organism - Xanthomonas Perforans		
	AG-Series	X-Series	Control
30000 Lux	>99.99999%	>99.97%	>65%
1200 Lux	>99.95%	n/a	n/a
300 Lux	>99.9%	n/a	n/a
No-illuminated	>65%	n/a	n/a

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Public Service and Transportation

Solution and Case Study

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1. *Budapest metro lines is the 2nd oldest metro system in Europe, which include 52 stations, total length 38.7 km, it serves more than 1 million passengers every day.*
2. *After applied GENS's products, the random inspection's bacteria counting keep reducing 90%-95% in a one year continuous monitoring, it even works longer the better.*
3. *The performance of the coating doesn't have any decreasing in the one year monitoring test after coating even it has more than millions trips everyday.*

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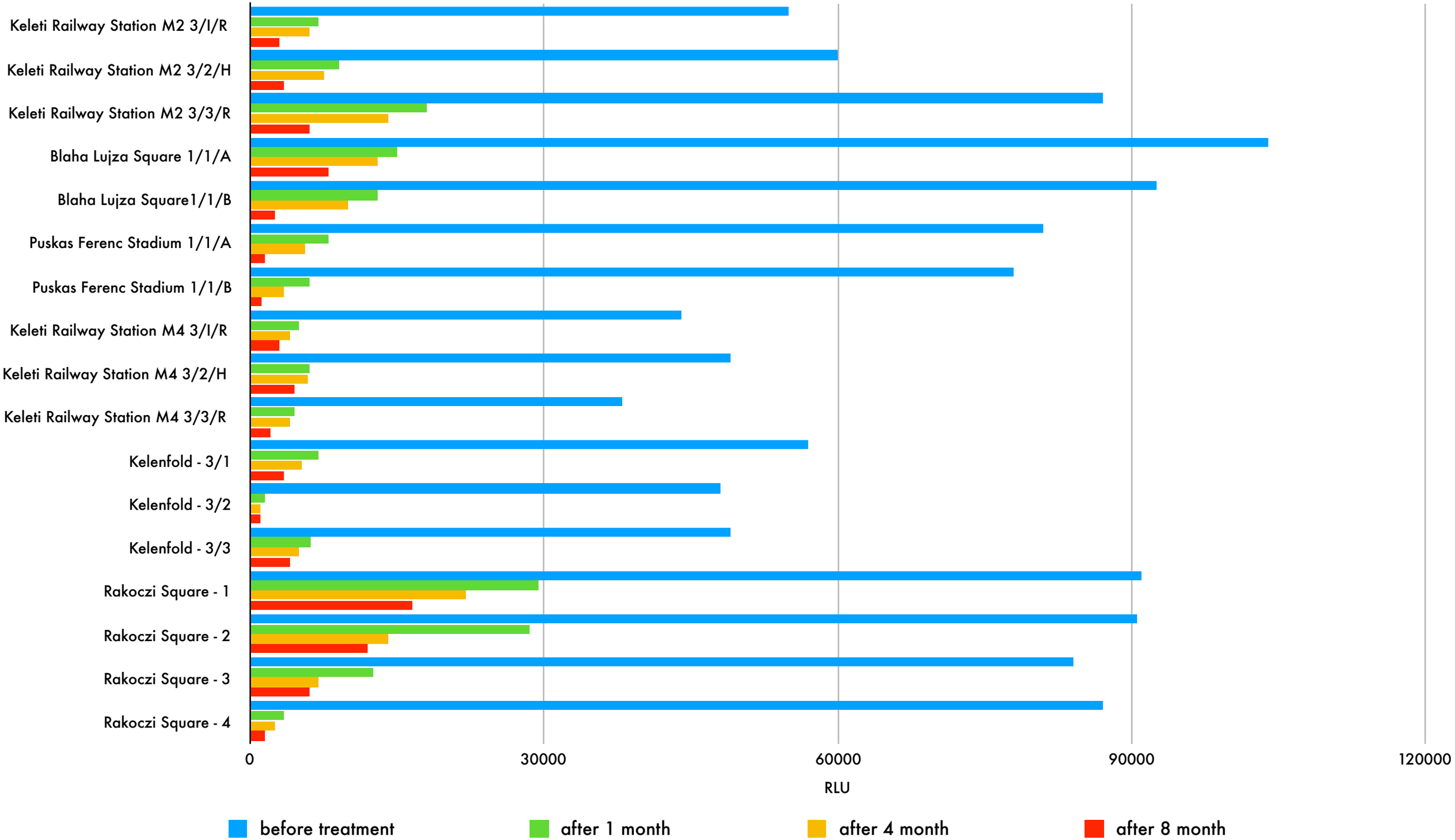
Bacterial count on surface of handrail



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Budapest Suburban Trains
Hungary

The Budapest suburban trains system[1] applied our advanced coating system to eliminate pathogenic bacteria and virus in all their trains cabins, seats, switches and handrails[2] to control the public cross-infection risk[3]. Our advanced coating system protect more than 200,000 passengers per day.

1. *Budapest suburban trains is major transportation system link the suburban and city central of Budapest, it includes 4 lines.*
2. *All 94 trains, and 294 vehicles are coated by our nano coating completely.*
3. *After applied GENS's products, the random inspection's bacteria counting keep reducing 90% in continuous monitoring thereafter.*

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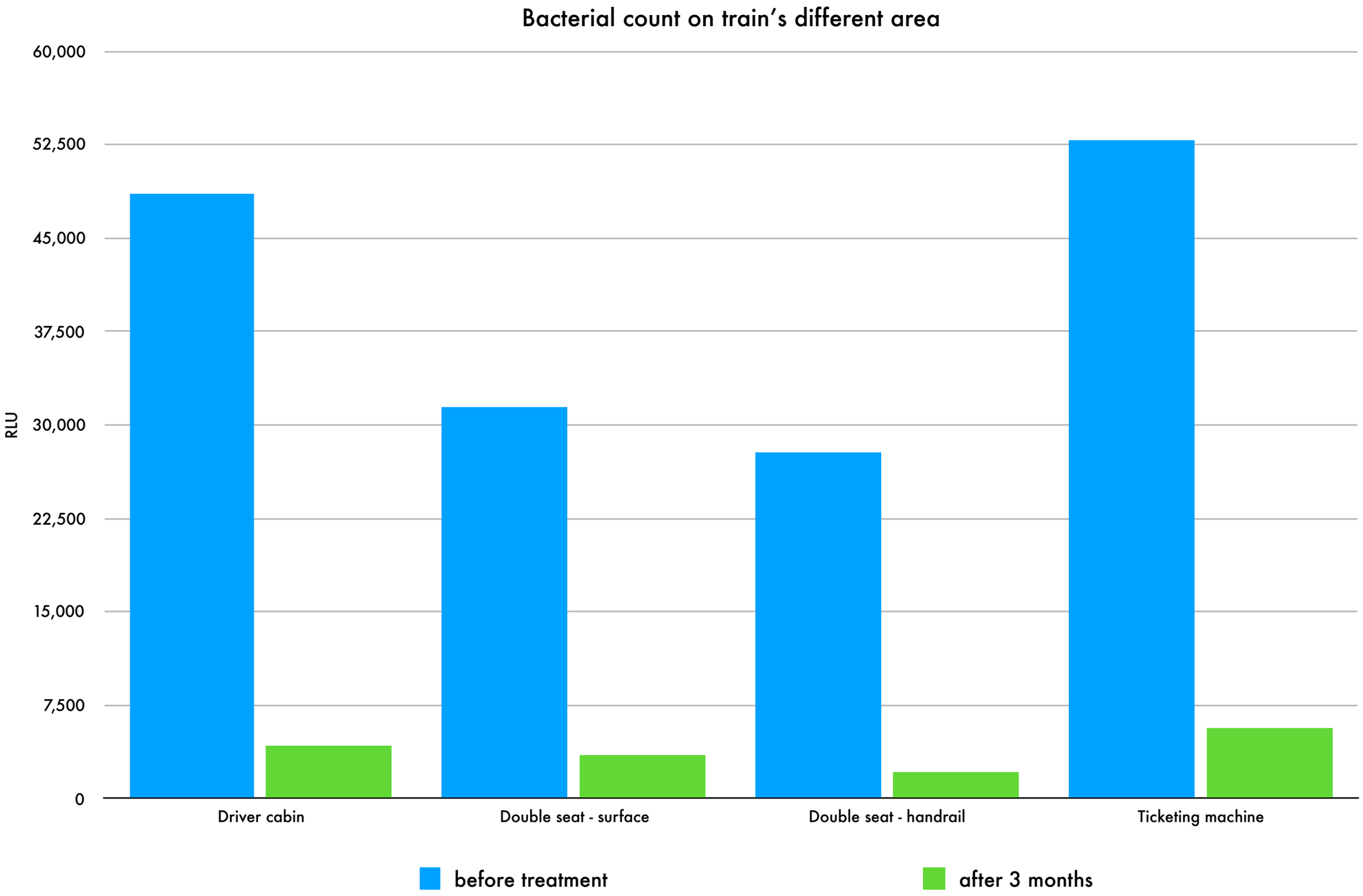

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Healthcare and Education

Solution and Case Study

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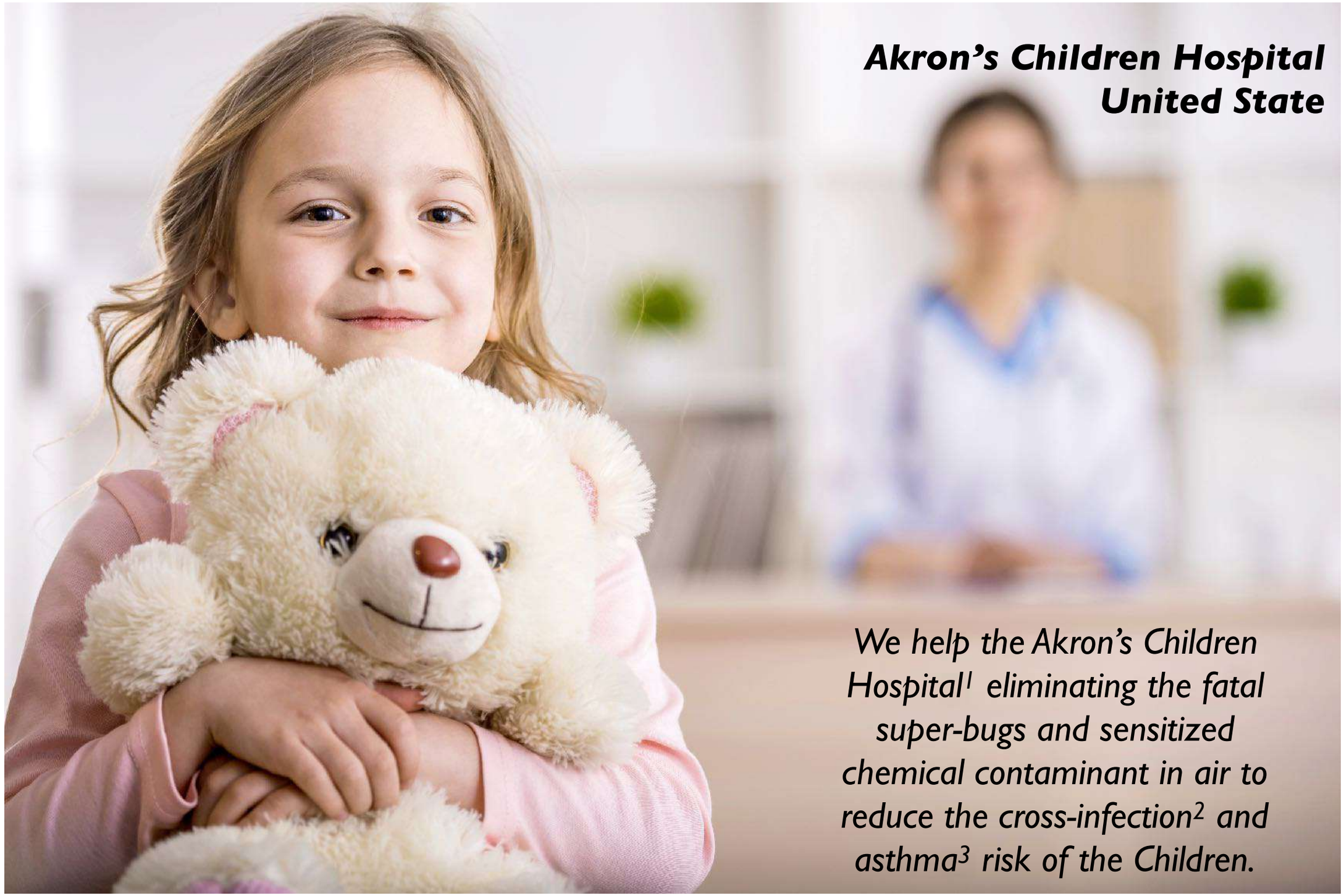

1. *Akron's is the biggest US children hospital, honored as the best US children hospital in 2015-2016 by US News.*
2. *According to the incomplete statistics, cross-infection increase the healthcare system cost exceed 130B USD every year in US.*
3. *High incidence of asthma has been observed for many years, and air pollutant is deemed to be the major inducement.*

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Cross-Infection Reducing Case Study
Emory University Healthcare Group

Total Infection Rate

	12 months prior	17 months post	
CDC Category	Rate	Rate	P-Value
GI	0.36	0.30	0.63
SST	1.02	0.91	0.54
BSI	0.03	0.04	0.76
EENT	0.71	0.35	0.04
UTI	1.68	0.98	0.03
URI	0.22	0.06	0.16
LRI	0.53	0.50	0.84
All Infection	4.57	3.23	0.02

The hospital of Emory University Healthcare Group eliminating the pathogenic risk in the environment by using our anti-microbial hygienic coating. Total infection rate declined by approximately 30%[1], the EENT, UTI reducing achieved statistical significance (P<0.05)[2], even in small data set[3].
URI reducing more than 70% in the study.[4]

1. *There were fewer total infections for the full year after applying the coating (n=185) compared with the year prior to applying the coating (n=275).*
2. *Both EENT, UTI and total infection reducing achieved statistic significant result according to statistic criterion.*
3. *The facility has 250 beds, infections were monitored and recorded according to well-established institutional protocols*
4. *URI recorded a more than 70% reducing in the study, but the P-Value of the result is 0.16 > 0.05 due to strong outside environment influence and small sample dataset.*

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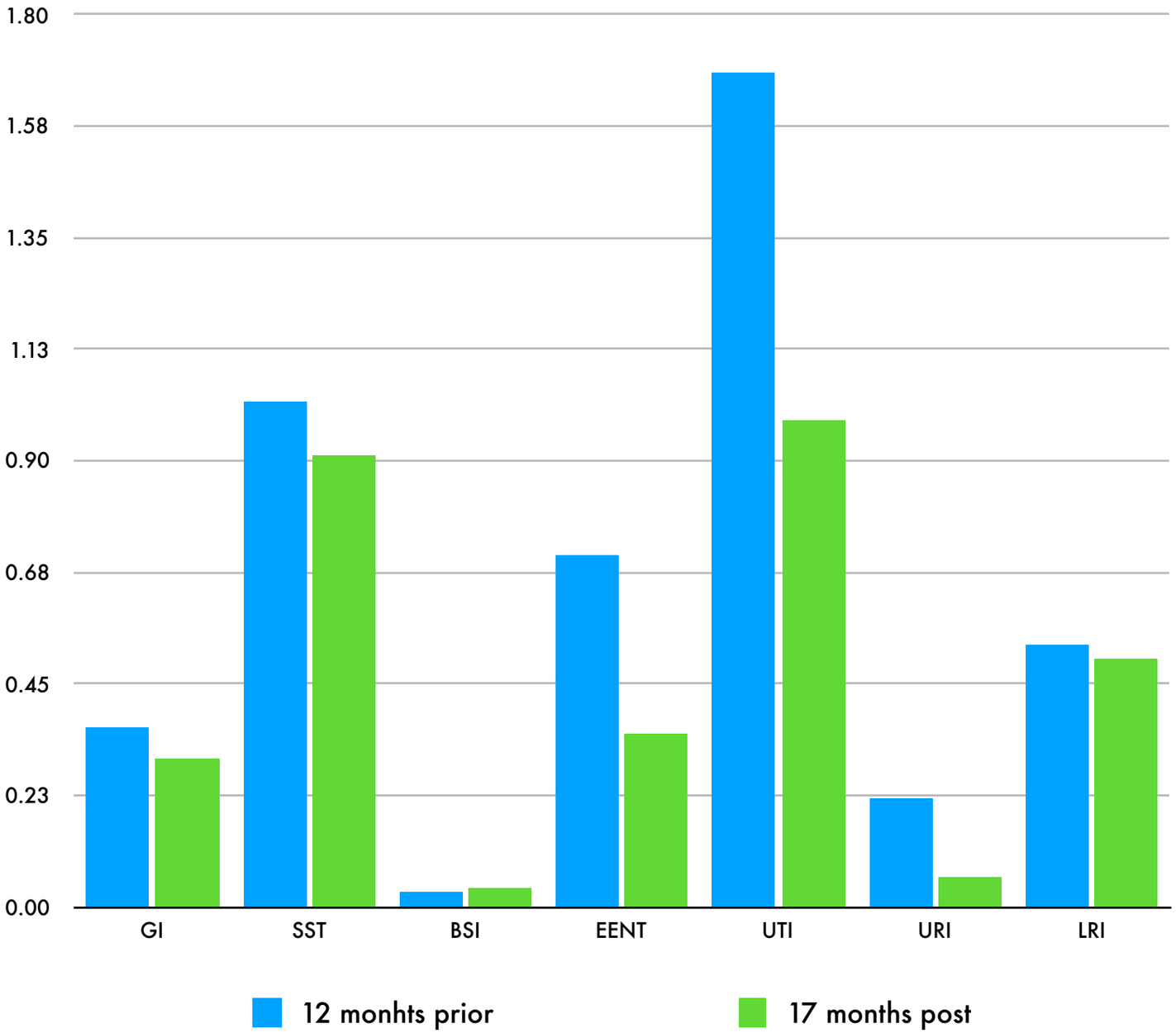
INFECTION RATE COMPARISON CHART

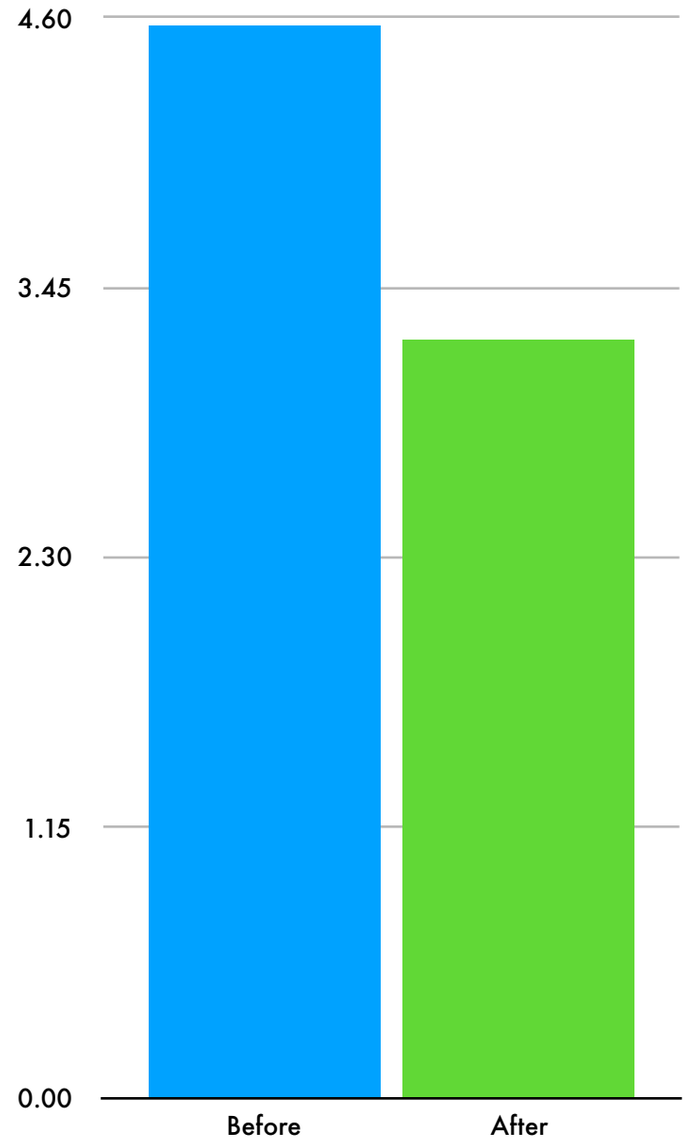
Infection rates are the average events per 1,000 patient days

American Journal of Infection Control 43 (2015) 180-1

Infection Rate Classified by CDC Category *



Total Infection Rate



✳ *GI, gastrointestinal; SST, soft skin tissue; BSI, blood stream infection; EENT, eyes, ears, nose, and throat;*
✳ *UTI, urinary tract infection; URI, upper respiratory infection; LRI, lower respiratory infection;*

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Caritas Kindergarten of Krefeld Germany

We help the Caritas Kindergarten of Krefeld [1] purifying the chemical contaminant, pathogenic bacteria and virus in public area to reduce the children's cross-infection tremendously[2], so they can provide a healthy and safe living environment[3].

1. *Caritas Kindergarten of Krefeld has more than 100 years history in Germany.*
2. *After applied GENS's products, the sickness rate in winter reduced respectively 72%, 64%,52% in the following 3 years.*
3. *The cross-infection between children through air or contact becomes the biggest nosogenesis.*

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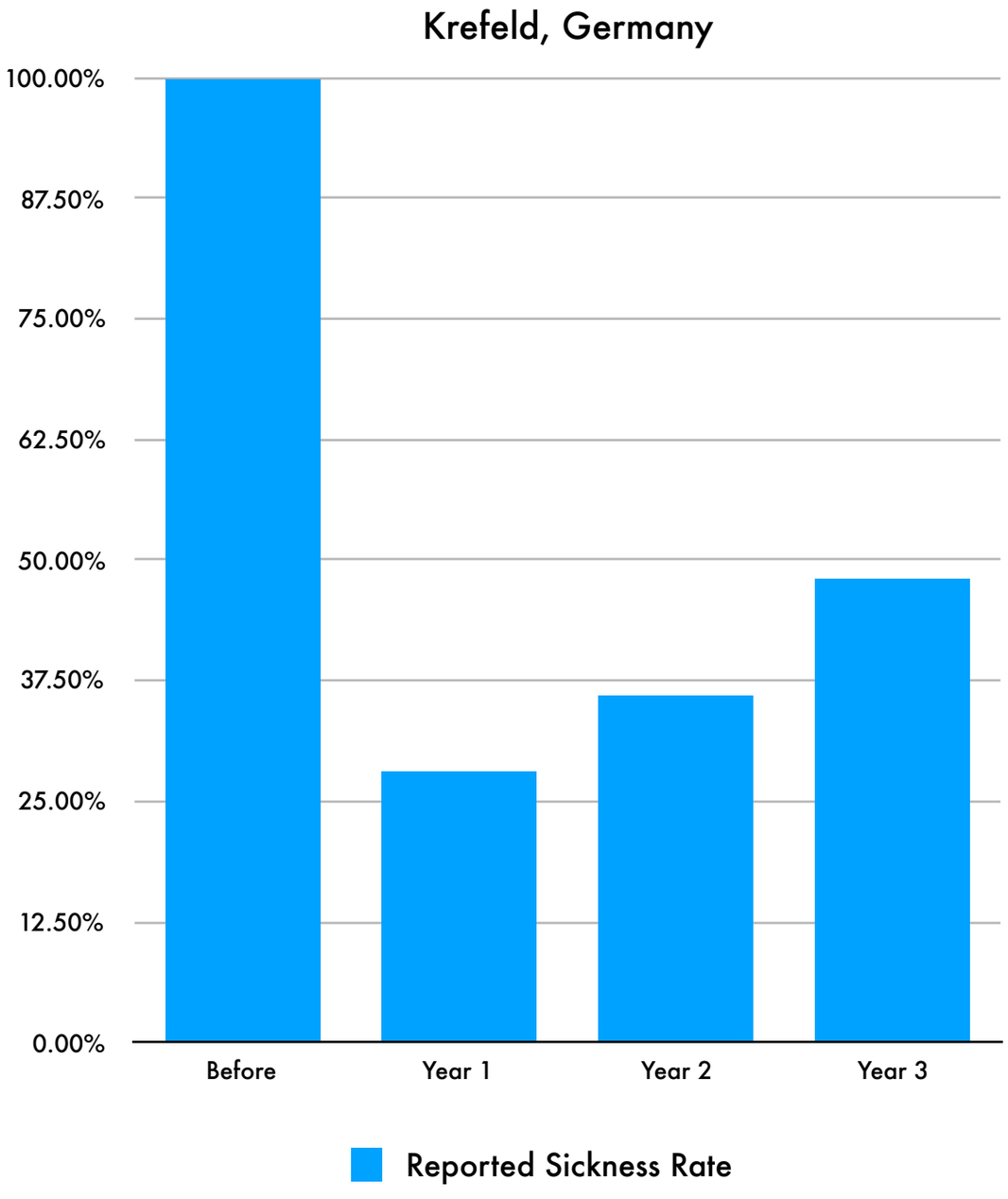
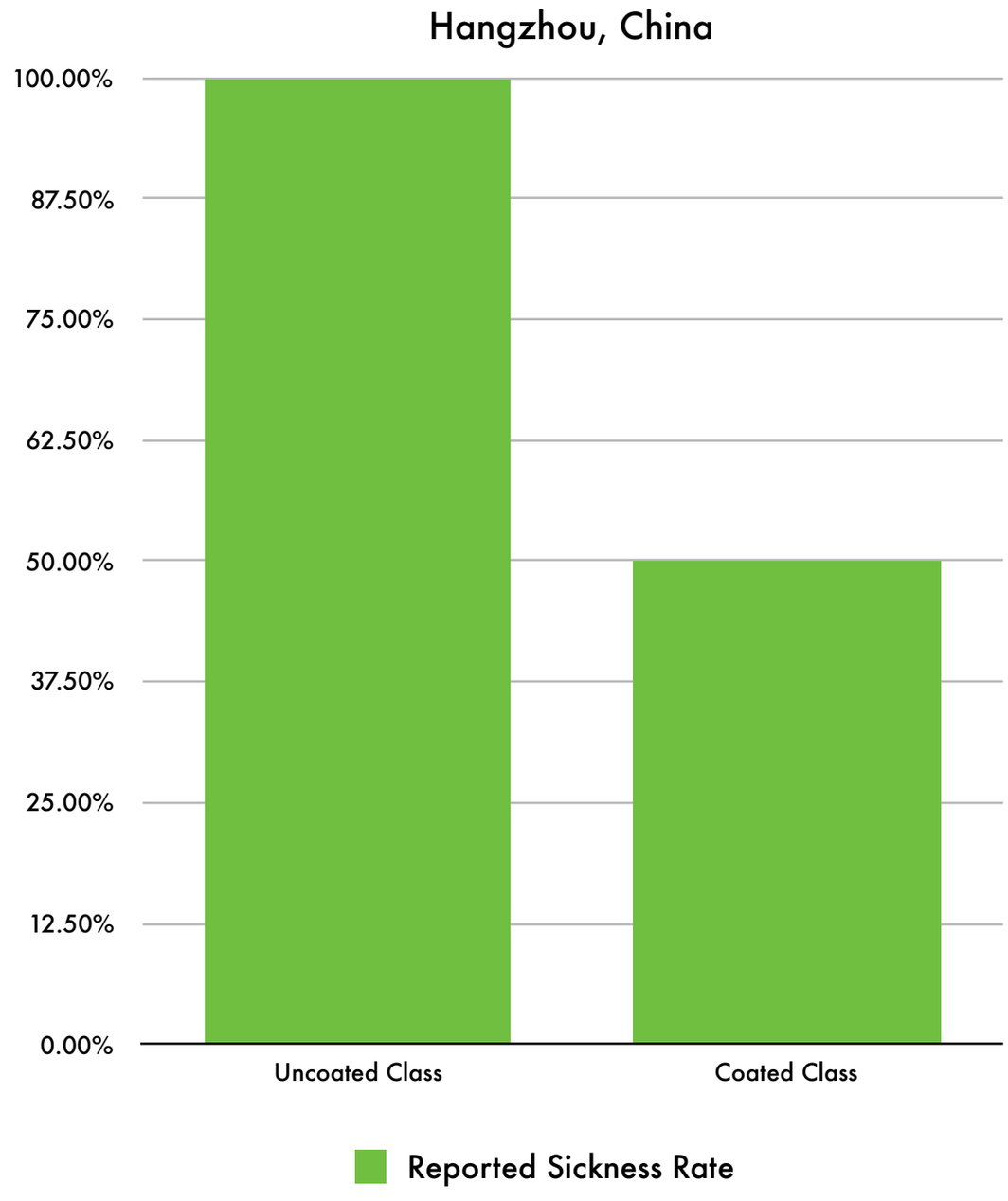
INFECTION RATE DECREASING





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Attikon University General Hospital Greece

ICU Bacteria Counting Analysis

n=8	Before	After	P-Value
Group	RLU Avg	RLU Avg	
Control Room A	427.25	482.13	0.286
Coated Room B	118.92	21.25	0.029

ICU Pass Rate Analysis

n=24 norm=60	Control Room A	Coated Room B	P-Value
Time	Pass Rate	Pass Rate	
Before	33.3%	37.5%	1.000
After	62.5%[1]	91.7%	0.023

We help the hospital control the pathogenic risk in the ICU by using our anti-microbial hygienic coating. Total bacteria counts reading declined by approximately 82% and the pass rate increase 245% ($P<0.05$)[2].

1. *During the test, Room A occupied 50% and Room B occupied 100%. Within a few weeks after the coating, no patients in Room A but hospital still kept performing the same disinfection procedure as usual. It can be found that the pass rate of Room A has improved during this time. Room B remains full, but the pass rate is significantly better than that before the coating and the control Room A.*
2. *Both bacterial counts reading and pass rate improving achieved statistic significant result according to statistic criterion.*

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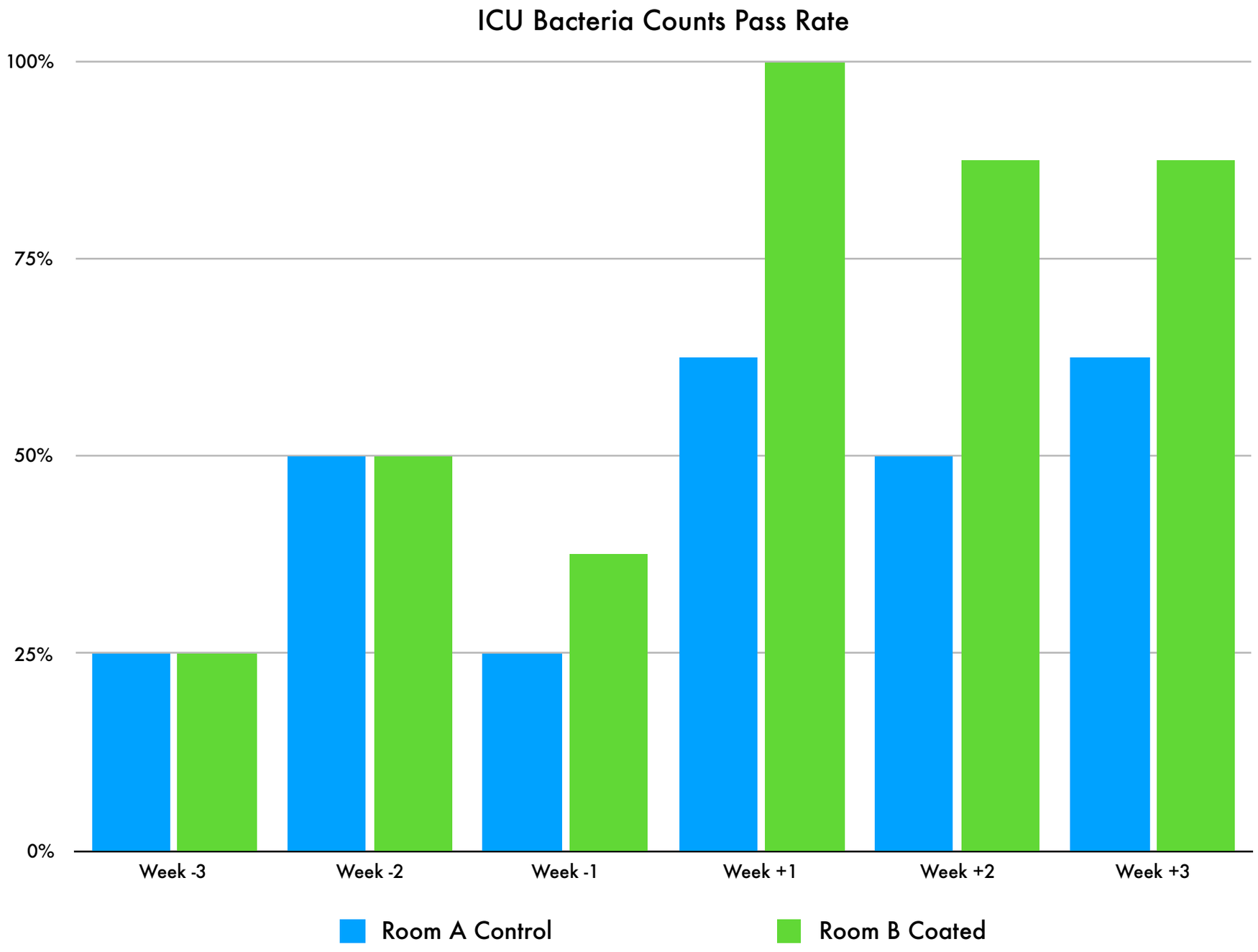
PASS RATE COMPARISON CHART

Pass rate based on criteria that ATP readings <60



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Ambulance in Rijnmond Emergency Center Rotterdam, the Netherlands

Ambulance Bacteria Counting Analysis

n=7	2 weeks prior	Cleaning & Coating	3 weeks post	P-Value
Group	RLU Med	RLU Med	RLU Med	
Control	211	45	187	0.286
Coated	153	14	10	0.029

Ambulance Pass Rate Analysis

n=14, norm=60	Control	Coated	P-Value
Time	Pass Rate	Pass Rate	
2 weeks prior	14.3%	14.3%	1.000
Cleaning & Coating	85.7%	71.4%	0.515
3 weeks post	100%	28.6%	0.005

We improving the hygienic level in the ambulance by using our anti-microbial hygienic coating. Total bacteria counts reading declined by approximately 93% and the pass rate increase 714% ($P<0.05$)[2].

1. *The pass rate before coating was very low. Using Pearson chi-square test analysis, it was found that there was almost no difference between the two groups (P = 1.000). After the standard disinfection cleaning and coating, the pass rate of the two groups increased significantly, with no significant results The difference (P = 0.515), but after 3 weeks, the coating group pass rate was significantly higher than the control group showing a significant difference (P = 0.005).*
2. *Both bacterial counts reading and pass rate improving achieved statistic significant result according to statistic criterion.*

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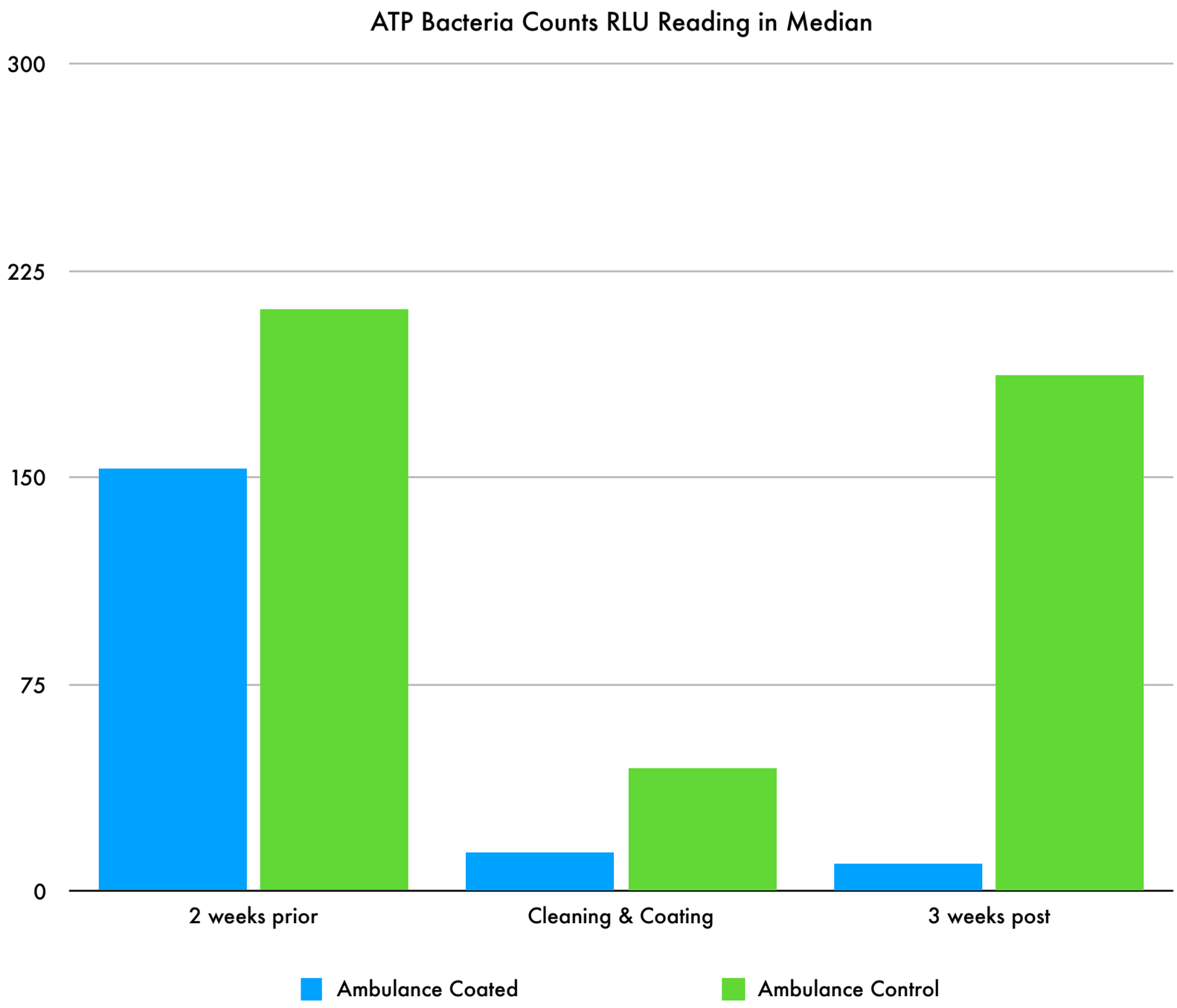
BACTERIA COUNTS COMPARISON CHART

Bacteria counts is based on RLU reading from ATP measure



References

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