SPECTRACLEAN™
ANTIMICROBIAL LIGHTING

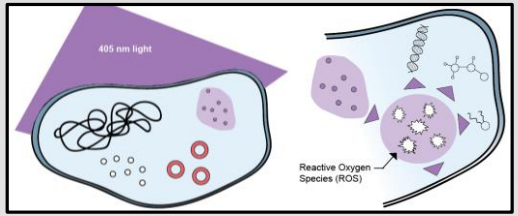
Illumination with disinfection, the joining of lighting science and microbiology.

Blended SpectraClean

Dedicated SpectraClean

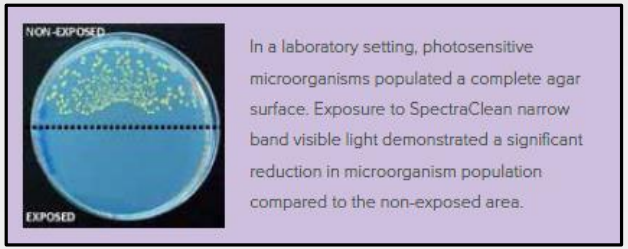
The Science Behind Antimicrobial Lighting

Photosensitive pathogens absorb High Intensity Narrow Spectrum (HINS) light.



HINS light accelerates the creation of damaging reactive oxygen species (ROS).

Cell damage leads to cell inactivation.



In a laboratory setting, photosensitive microorganisms populated a complete agar surface. Exposure to SpectraClean narrow band visible light demonstrated a significant reduction in microorganism population compared to the non-exposed area.

SPECTRACLEAN™ ANTIMICROBIAL LIGHTING

Is proven effective For:

Foodborne Risks

- Food poisoning - Campylobacter jejuni
- E coli - Escherichia coli
- Salmonella - Salmonella enteritidis
- Listeria - Listeria monocytogenes
- C Diff - Clostridium difficile
- Shigella - Shigella sonnei
- Bacillus cereus
- C. perfringens - Clostridium perfringens

Airborne Risks

- Pneumoniae - Klebsiella pneumoniae
- Corynebacterium striatum
- Acinetobacter baumannii
- Serrati spp
- Pseudomonas aeruginosa
- FCV - Feline calicivirus

Surface Contamination Risks

- *MRSA - Staphylococcus aureus*
- Staph – Staphylococcus epidermidis
- Staph - Staphylococcus hyicus
- Strep Throat - Streptococcus pyogenes
- Thrush - Candida albicans
- Skin Infections - Mycobacterium terrae
- Proteus vulgaris
- Serrati spp

Infection Risks

- E. faecium - **E**nterococcus faecium
- MRSA - **S**taphylococcus aureus
- Pneumoniae - **K**lebsiella pneumoniae
- **A**cinetobacter baumannii
- **P**seudomonas aeruginosa

(Antibiotic resistant **ESKAP**E Pathogens)

Research provided by the University of Strathclyde Glasgow

HUBBELL Lighting

Independent Validation

Scores of independent research documents to support efficacy and safety

Understanding Dosage for Visible Light Disinfection

Introduction

Since the discovery that 405 nm light can be used as an anti-bacterial agent, many research studies have been conducted to better understand the range of microorganisms (e.g. bacteria, fungi, viruses) that are

Introduction to Visible Light Disinfection

What Is Visible Light Disinfection?

Visible Light Disinfection (VLD) is a relatively new disinfection method that utilizes the phototoxic effect of 405 nm visible blue light. Researchers at the University of Strathclyde in Glasgow, Scotland discovered 405 nm light could kill bacteria and other microorganisms which

ARTICLE IN PRESS

American Journal of Infection Control

Major Article

Influence of a visible-light continuous environmental disinfection system on microbial contamination and surgical site infections in an orthopedic operating room

Lynnelle J. Murrell BSN, RN, CIC[a], Erin Kinzel Hamilton PhD[b], Helen Boehm Johnson MD[c,d], Maureen Spencer BSN, RN, MEd, CIC, FAPIC[d]

Surgical site infections (SSI) continue to place a substantial burden on the US health care system.[1] They are among the most common health care–associated infections, accounting for a major source of perioperative morbidity, prolonged hospitalizations, and health care expenditures.[2,3] This is particularly true for SSIs involving an implant, such as periprosthetic joint infections (PJI), which have been associated with a cost of $389,097-$474,884 per infection, a mortality rate of 25-7%, and a 5-year survival rate— that is worse than many cancers.[4-6]

Traditional stratification of SSI risk begins with the patient's own microbiome, followed by perioperative practice variables including surgical technique, attire and instrument sterility, and operating room (OR) environment.[7] The latter, however, is increasingly recognized as a potentially significant reservoir for pathogens. Multiple studies have demonstrated the presence of organisms commonly associated with SSIs in the air and on surfaces within the OR, despite regular manual cleaning,[8-10] underscoring the idea that many traditional manual disinfection and decontamination protocols are suboptimal in achieving a truly "clean" OR environment.[11-13] Residual contamination can pose an infection risk via the complex interplay of surface and air dynamics in an occupied OR. Staff and equipment movement can disturb residual organisms and particulates on surfaces leading to their aerosolization and potential settling onto high-touch surfaces, sterile equipment, and into the surgical wound.[14,15]

The present study was a 2-pronged investigation to assess the efficacy of a visible-light continuous environmental disinfection (CED) system in (1) reducing bacterial contamination on surfaces within an orthopedic OR, and (2) impacting SSI rates for procedures performed

RESEARCH

Inactivation of micro-organisms isolated from infected lower limb arthroplasties using high-intensity narrow-spectrum (HINS) light

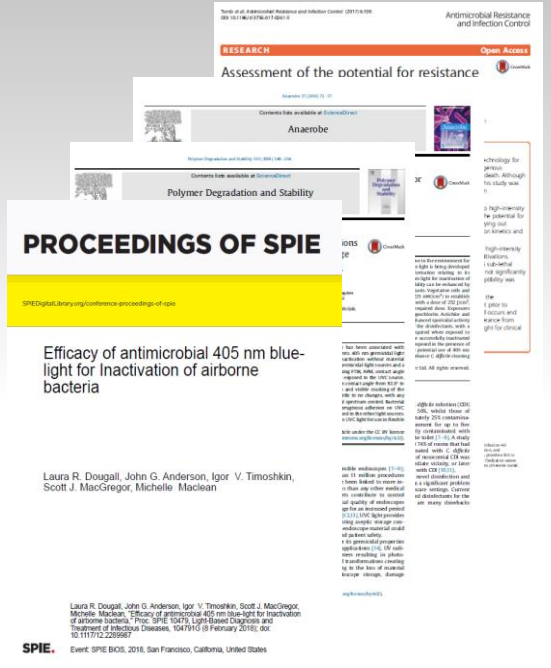
Inactivation of Bacterial Pathogens following Exposure to Light from a 405-Nanometer Light-Emitting Diode Array

Journal of Photochemistry and Photobiology B: Biology

RESEARCH LETTER

High-intensity narrow-spectrum light inactivation and wavelength sensitivity of *Staphylococcus aureus*

Michelle Maclean, Scott J. MacGregor, John G. Anderson & Gerry Woolsey



Antimicrobial Resistance and Infection Control

RESEARCH

Open Access

Assessment of the potential for resistance

Anaerobe

Polymer Degradation and Stability

PROCEEDINGS OF SPIE

SPIEDigitalLibrary.org/conference-proceedings-of-spie

Efficacy of antimicrobial 405 nm blue-light for Inactivation of airborne bacteria

Laura R. Dougall, John G. Anderson, Igor V. Timoshkin, Scott J. MacGregor, Michelle Maclean

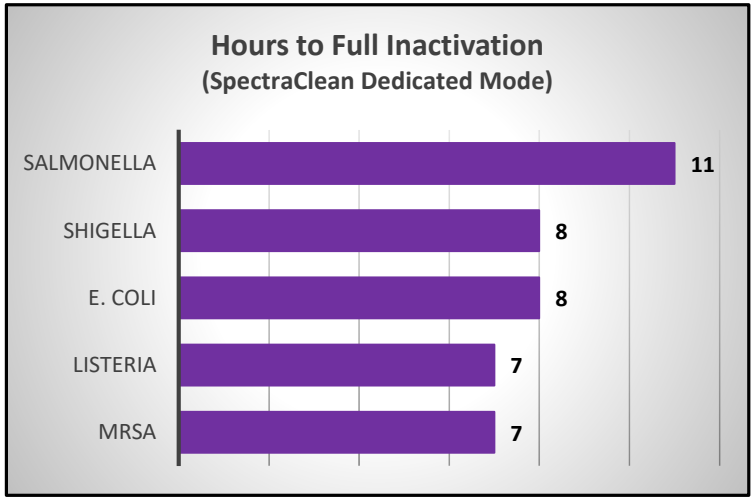
Laura R. Dougall, John G. Anderson, Igor V. Timoshkin, Scott J. MacGregor, Michelle Maclean, "Efficacy of antimicrobial 405 nm blue-light for Inactivation of airborne bacteria," Proc. SPIE 10479, Light-Based Diagnosis and Treatment of Infectious Diseases, 1047916 (8 February 2018); doi: 10.1117/12.2289867

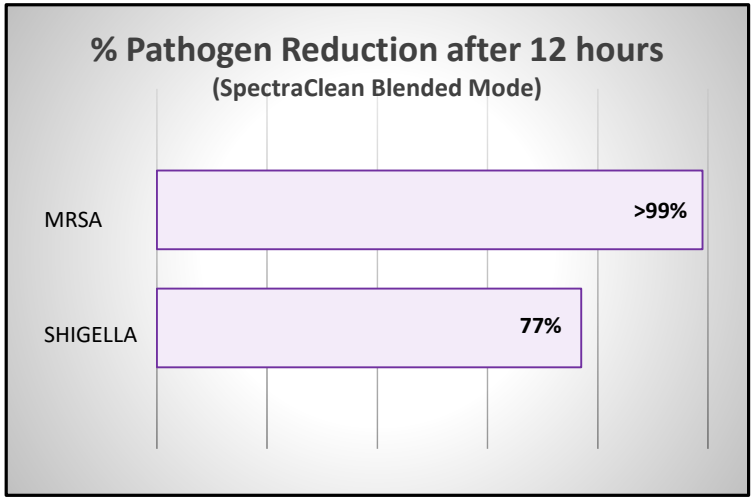
SPIE. Event: SPIE BIOS, 2018, San Francisco, California, United States

HUBBELL Lighting

Effectivity of SpectraClean

Laboratory results of SpectraClean light on photosensitive pathogens





SpectraClean | Approved Applications & Fields of Use

Food Industry ✓
Manufacturing, Packaging, Retail, Preparation, and Service

Education and Childcare ✓
Schools, Daycare, Dorms

Public Transportation ✓
Stations, Terminals, vehicles

Recreation and Wellness ✓
Exercise rooms, locker rooms, equipment rooms

Healthcare ⊘
Hospitals, Urgent Care, Nursing Homes, Veterinarians

Correctional ⊘
Prisons, jails, juvenile detention

Why SpectraClean? Food Safety

Rigorous food safety practices reduce risk but they are not foolproof.

The potential **consequences** of an outbreak are enormous.

An investment in SpectraClean Antimicrobial lighting, as a supplement to existing sanitation procedures, can help **protect** against an outbreak risk.

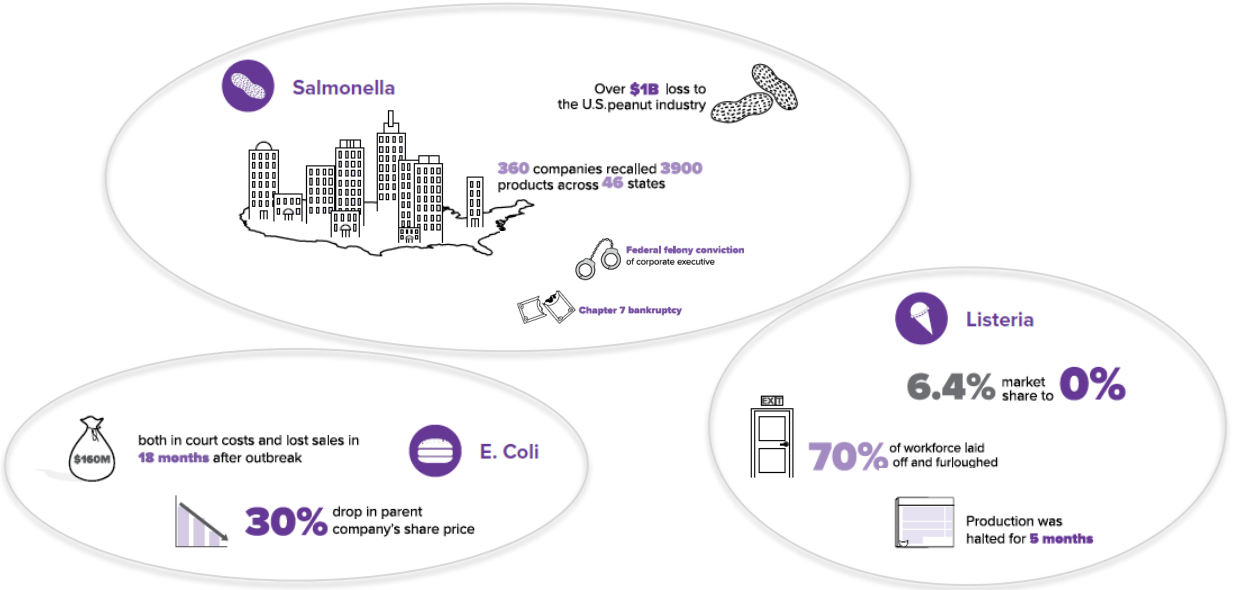
Foodborne illness outbreaks

The Human Factors:

Public safety and health

The Business Implications:

Revenue Loss
Fines
Litigation
Recalled Product
Production Stoppage
Damaged Brand Reputation



Promoting Food Safety

SpectraClean is effective

on these common foodborne pathogens…	…but not these.
✓	⊘
Salmonella	Norovirus
C perfringens	Botulism
Staph	Vibrio
E coli	Hepatitis A
C diff	
Shigella	
Campylobacter	
Bacillus cereus	
Listeria	

SpectraClean **complements** existing sanitation procedures to help safeguard the food supply.

SpectraClean is **not a substitute** for other cleaning methods, nor does it alleviate the need for diligence with established cleaning and hygiene practices.

Initial Product Portfolio

SCCT
SpectraClean Contemporary Troffer
- Dinning areas
- Class rooms
- Commercial Restrooms

SCLT
SpectraClean Lensed Troffer
- Commercial kitchens
- Day care facilities
- Hand wash areas

SCST
SpectraClean Strip
- Food retail
- Food storage
- Sanitation closets

SCVM|SCVW
SpectraClean Linear Vaportite
- Food production lines
- Cold storage
- Dishwashing areas

Blended.

SpectraClean Blended white light.

One luminaire, one mode of operation.

Dedicated.

SpectraClean Dedicated mode.

One luminaire, one mode of operation.

Blended Plus.

Blended white and Dedicated modes.

One luminaire, two modes of operation.

Independent.

White light and Dedicated SpectraClean modes.

One luminaire, two modes of operation.

ANSI/ASHRAE/IES 90.1-2016: In dual function luminaires, the antimicrobial mode is exempt from the Lighting Power Allowance.

4 SpectraClean Modes Enable Flexible Antimicrobial Options to Meet a Variety of Applications

HUBBELL Lighting

NX Control for Bi-modal configurations

Blended Plus Independent

Bi-modal operation requires **2 circuit control** via NX room controller for either schedule or occupancy based control of the **Dedicated** SpectraClean mode.