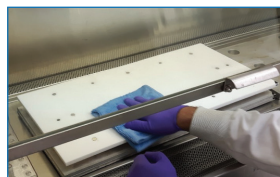


### Field-Relevant Testing of Microbicidal Wipes:

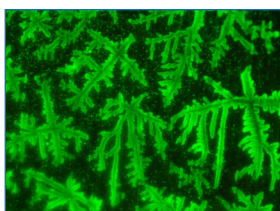
Using our newly published test method (Zargar & Sattar, Lett. Appl. Microbiol, 2023), we can test microbicidal wipes for efficacy against a variety of pathogens on environmental surfaces under controlled or field-relevant conditions (the



third tier of our quantitative carrier test (QCT-3). Further, we can assess the degree of transfer of pathogens to clean surfaces during the wiping.

### Testing of disinfectants against wet and dry biofilms:

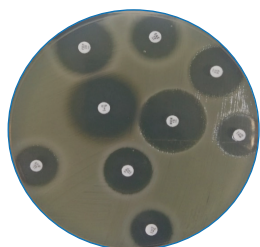
CREM Co Labs has recently established a standardized protocol to produce dry biofilms with bacteria to assess their susceptibility to environmental surface disinfectants. The immediate



application of such a quantitative carrier test protocol will be in assessing disinfectants against dry biofilm of different types of bacteria and also different types of fungi such as *Candida auris*, an emerging human pathogen of global significance.

### Antimicrobial Susceptibility Testing:

There is concern that exposure of human and animal pathogens to sublethal levels of disinfectants during use and/or in the waste stream may select for resistance to microbicidal products; such resistance may also generate cross-resistance to chemotherapeutic agents such as antibiotics. CREM Co developed a protocol for susceptibility testing on different liquid disinfectants.



### Microbiological Quality of Potable & Recreational Waters:

The ever-increasing demand for water and the ongoing climate change together are poised to enhance the waterborne spread of pathogens. CREM Co Labs' in-house expertise in health-related water microbiology, along with its established links with outside specialists, can help the private and public sectors study pathogen survival and inactivation in potable and recreational waters.

**Aptamers:** We have in-house expertise in developing DNA-based aptamers against a variety of enteric viruses, bacteria and protozoa for use with foods, potable waters and municipal wastes.

### Survival and Inactivation of Foodborne Pathogens:

CREM Co Labs can help clients assess the survival and inactivation of pathogens in dairy products and other foods.

**State-of-the-Art Reviews:** CREM Co Labs can assist clients in the preparation of critical reviews of published literature on emerging or controversial issues in health-related environmental microbiology.

### Assessment of Handwash and Handrub Agents against Human Pathogens:

Although proper and regular hand hygiene is crucial in infection prevention and control (IPAC), the testing and label claims of products marketed for the purpose often do not reflect the realities of field use. CREM Co Labs can assess such formulations using in vivo test protocols recommended by Health Canada and U.S.FDA.



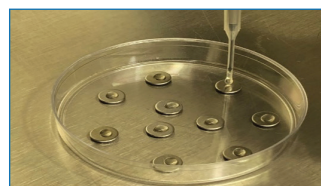
### Residual Disinfectant Claims:

CREM Co Labs is equipped with and experienced in testing for both bactericidal and virucidal residual claims based on the U.S. EPA interim method and modified O1-1A protocol.



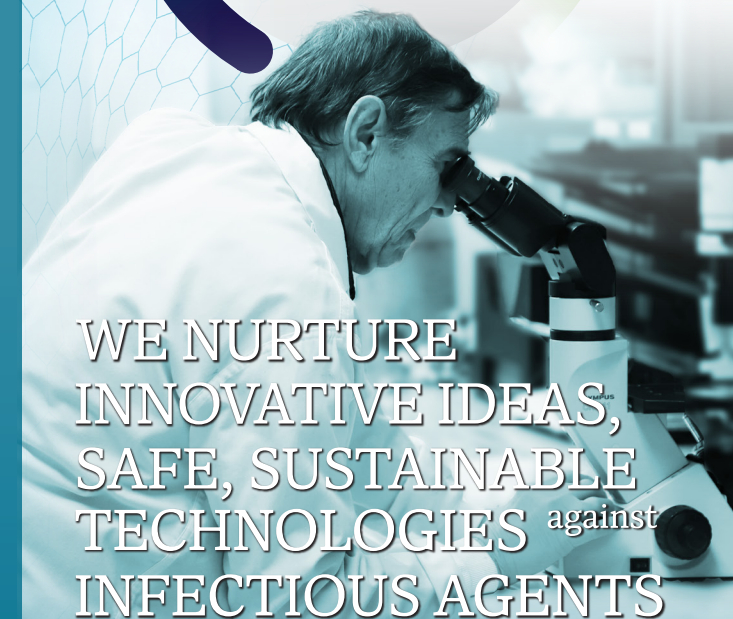
### Testing Disinfectants against the Spores of *C. difficile*:

*C. difficile*, a major cause of potentially fatal diarrhea, often causes outbreaks in healthcare and other settings. Its spores are refractory to common disinfectants. CREM Co Labs has the experience in and facilities for work with this pathogen, and to assess the effectiveness of environmental surface disinfectants against it using currently accepted carrier testing.



### Standards and Development of Standard Test Methods:

Personnel at CREM Co Labs actively participate in standards-setting organizations such as ASTM International and AOAC International and regularly contribute to the creation and review of standard methods for assessing microbicides.



WE NURTURE  
INNOVATIVE IDEAS,  
SAFE, SUSTAINABLE  
TECHNOLOGIES against  
INFECTIOUS AGENTS

### CREM Co Labs

is a contract and R&D facility registered with the Public Health Agency of Canada to handle pathogens at Biosafety/Containment Levels 1 and 2 under Good Lab Practices (GLP) to meet the mandates of Health Canada and the U.S. Environmental Protection Agency (EPA) using standards of ASTM, EN, ISO, AOAC, and US Pharmacopeia.

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### Areas where CREM Co Labs can serve its clients are:

- Microbicidal efficacy testing in/on indoor air, hands, foods, potable and recreational waters and surface sanitizers/disinfectant for Health Canada and U.S. EPA registrations.
- Field assessments of decontamination technologies using different audit kits for surface and airborne pathogens.
- Drug Screening and Discovery using Zebrafish as an Animal Model.
- Toxicology Testing using Zebrafish.
- Microbiology Testing of foods, drugs, cosmetic and Cannabis products (USP 61 & 62).
- Stability Tests on disinfectants.

### Efficacy test on pathogens in/on air, skin, foods, potable and recreational waters and surface sanitizers/disinfectants for Health Canada and U.S. EPA registration.

- Testing hard-surface disinfectants (AOAC Use-Dilution and AOAC Germicidal Spray Tests, AOAC Germicidal Wipes Test, ASTM E1053, ASTM E1052, ASTM E3218-19 and ASTM E3218-21).
- Testing for removal/decontamination of bacteria, viruses and fungi in indoor air using room-sized aerobiology chambers (ASTM E3273-21 and AHAM AC-5).
- Assessing claims for residual microbicidal activity against bacteria and viruses using U.S. EPA Interim method and modified 01-1A protocol and other innovative test protocols.
- Conducting Non Food-Contact Sanitizer Test (ASTM E1153).
- Quantitative Carrier Tests for Clostridioides difficile spores, Candida auris, bacteria, viruses, fungi, and mycobacteria (ASTM E3218-19 and ASTM E3218-21).
- Assessment of handwash and handrub agents against human pathogens (EN 13624, EN 13727, ASTM E2276, E2613, and E2011).
- Evaluating the Efficacy of antimicrobial test substances on porous surfaces against bacteria (US EPA Interim Quantitative Method).
- Testing of disinfectants against wet and dry biofilms.

### Field Assessments of Decontamination Technologies using Different Audit Kits for Surface-borne and airborne pathogens.

CREM Co's novel auditing kit can sample environmental surfaces as large as 30x60 cm (1x2 feet) in healthcare and other facilities with >80% efficiency of recovery of the bioburden. The method is simple, economical and quantitative. CREM Co's audit kits permit sampling of smooth and uneven surfaces while also recovering microbes even in dried surface biofilms. The kits can assess the presence of bacteria and fungi/unit surface area sampled. The turnover time of the method remains similar to that of other available methods.

We can also analyze the bioburden for its bacterial/fungal content using culture, genotypic and phenotypic Identification (PCR/BIOLOG).



CREM Co Labs is capable of sampling indoor air for the presence of pathogens such as bacteria, fungi and viruses. CREM Co Labs is using Slit-to-Agar machines which are programmable and can sample the air from 2 min to 5 hours.



### Microbiology Testing of Food, Water, Drugs, and Cannabis products (USP 61 & 62)

CREM Co Labs can test non-sterile products for Salmonella spp., Salmonella enteritidis, Listeria monocytogenes Listeria spp., E. coli O157:H7, Non-O157 STEC, Campylobacter spp., Campylobacter jejuni, Cronobacter spp., Shigella spp., Staphylococcus aureus, Vibrio parahaemolyticus, Bacillus cereus, Yesinia enterocolitica and Clostridium perfringens.

### Stability Test on Disinfectants

CREM Co Labs can perform stability tests for the monitoring of finished products to determine the normal shelf-life of the product, therefore, assigning the expiration date required to be present on the label of each tested product.

We can also perform chemical analyzes on active ingredients in disinfectants and issue certificate of analysis under GLP.

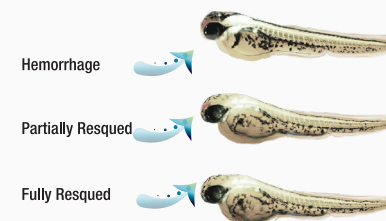
### Drug Screening and Discovery using Zebrafish as an Animal Model

Zebrafish, with 70% similarity with human genome, is a powerful tool for high throughput screening of drugs. 85% of disease-associated genes in humans can be found in zebrafish. Transparency of zebrafish allows the ready examination of their internal structures and functions directly.

The short generation time makes it possible to yield experimental results in 6 days or less while keeping the costs low for the pharma and cosmetics industries.

### Available assays:

Anti-oxidation, Melanin Quantification, Parkinson/Alzheimer, Epilepsy, Anxiety/Stress, Brain Microbleeding (BMB)/ Intracerebral hemorrhage (ICH), Wound healing, Diabetes, and various toxicity assays.



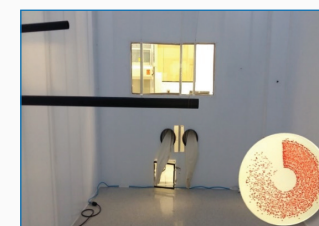
### Toxicology Testing using Zebrafish as an Animal Model:

CREM Co Labs uses zebrafish as an animal model following OECD-236 guideline to screen chemicals for different types of toxicity such as teratotoxicity, cardiotoxicity, neurotoxicity and multi-toxicity in a very short time and at an affordable price.



### Assessing Air Decontamination Technologies and Studying the Survival and Inactivation of Human Pathogens in Indoor Air:

We can assess all types of air decontamination technologies against a wide variety of microorganisms (bacteria, viruses, bacteriophages, fungi and mycobacteria). Our unique facilities and robust test protocols for studying microbial fate in indoor air and assessing technologies claiming air decontamination comply with the guideline of the U.S. EPA.



The aerobiology protocol developed at CREM Co Labs have become a part of ASTM International's Standard (ASTM 3273-21) and was referred in AHAM AC-5. CREM Co Labs is AHAM approved laboratory for aerobiology testing. CREM Co Labs generated the data for registration of the first air sanitizer (Lysol) which has been registered by the EPA.