Mold Testing and Remediation

- The problems with mold sampling and remediation.

- Helping your clients get the best information to overcome mold illness.

WHOLE HOME & BODY HEALTH

Who Am I?

- Board Certified In Holistic Nutrition
- Certified Building Biology Environmental Consultant
- Certified Electromagnetic Radiation Specialist
- Certified Residential Mold Inspector
- Senior EMF Consultant for Shield Your Body
- Health Educator for St. Lukes Health System

Cathy has been featured on several podcasts and radio shows including:: The Kelly O Show, The Project Kuwait, Learn True Health, The Divine Insight Show, The Lifestyle Locker with Dr. Josh Handt, A Whole New You, Natural Wellness TIps, The Skin You're In, Shield Your Body, Rebel Health Tribe, and others.

Whole Home and Body Health

- Mold Inspections
- Remediation Plans
- Post-remediation Clearance
- EMF Testing
- EMF Mitigation
- Health Coaching
- Functional Medicine Labs
- Environmental Detox

WHOLE HOME & BODY HEALTH

Agenda

- Basics of mold investigation
  - Industry standards vs. holistic standards
- Mold sampling
  - Air samples, ERMI, Agar plates, direct samples
- Remediation
  - Industry standards vs. holistic standards

Why Is This Topic Important?

WHOLE HOME & BODY HEALTH

Health Affects of Mold

- Immune Suppression
- Hormonal Disruption
- Brain Inflammation
- Gut Inflammation
- Liver and kidney dysfunction
- Pregnancy and Fertility Issues
- Respiratory Issues
- Mood and Behavior Disruption
- ….and much more

Toxins **2013**, *5*, 605-617; doi:10.3390/toxins5040605

OPEN ACCESS

toxins

ISSN 2072-6651

www.mdpi.com/journal/toxins

Article

Detection of Mycotoxins in Patients with Chronic Fatigue Syndrome

Joseph H. Brewer [1,*], Jack D. Thrasher [2], David C. Straus [3], Roberta A. Madison [4] and Dennis Hooper [5]

1. Plaza Infectious Disease and St. Luke's Hospital, 4320 Wornall Road, Suite 440, Kansas City, MO 64111, USA
2. Citrus Heights, CA 95610, USA; E-Mail: toxicologist1@msn.com
3. Department of Immunology and Molecular Microbiology, Texas Tech University Health Sciences Center, Lubbock, TX 79430, USA; E-Mail: David.Straus@ttuhsc.edu
4. California State University, Northridge, CA 91330, USA; E-Mail: vchsc001@csun.edu
5. RealTime Laboratories, Carrollton, TX 75010, USA; E-Mail: dhooper@realtimelab.com

* Author to whom correspondence should be addressed; E-Mail: jbrewer@plazamedicine.com; Tel.: +1-816-531-1550, Fax: +1-816-531-8277.

Review > Neural Regen Res. 2019 Sep;14(9):1490-1493. doi: 10.4103/1673-5374.255959.

Fungal-contaminated grass and well water and sporadic amyotrophic lateral sclerosis

Peter William French [1], Russell Ian Ludowyke [2], Gilles J Guillemin [3]

Affiliations + expand

PMID: 31089037 PMCID: PMC6557101 DOI: 10.4103/1673-5374.255959

Free PMC article

Abstract

Fungi are important infectious disease-causing agents, but are often overlooked as environmental factors in disease. We review several lines of evidence that point to a potential fungal origin of sporadic amyotrophic lateral sclerosis (ALS), the most common form of motor neurone disease. Approximately 90% cases of ALS are sporadic, and the aetiology of sporadic ALS is still unknown. We have previously postulated that grass or soil-associated fungal infections may be a leading cause of sporadic ALS. Herein we extend this proposal to water-associated fungi. A wide variety of fungi have been reported in drinking water including Acremonium, Alternaria, Aspergillus, Cladosporium, Fusarium, Penicillium and Trichoderma. Some of these are known to produce neurotoxic mycotoxins. Despite this, drinking water is not routinely monitored for fungal contamination. Fungal contamination could explain the close correlation between distribution of well water and cases of sporadic ALS in the United States. We propose several mechanisms by which an opportunistic fungal infection from environmental exposure (to water, soil or plants) can

Review > Toxins (Basel). 2018 May 24;10(6):214. doi: 10.3390/toxins10060214.

Aflatoxin B1 and M1: Biological Properties and Their Involvement in Cancer Development

Silvia Marchese [1], Andrea Polo [2], Andrea Ariano [3], Salvatore Velotto [4], Susan Costantini [5], Lorella Severino [6]

Affiliations + expand

PMID: 29794965 PMCID: PMC6024316 DOI: 10.3390/toxins10060214

Free PMC article

Abstract

Aflatoxins are fungal metabolites found in feeds and foods. When the ruminants eat feedstuffs containing Aflatoxin B1 (AFB1), this toxin is metabolized and Aflatoxin M1 (AFM1) is excreted in milk. International Agency for Research on Cancer (IARC) classified AFB1 and AFM1 as human carcinogens belonging to Group 1 and Group 2B, respectively, with the formation of DNA adducts. In the last years, some epidemiological studies were conducted on cancer patients aimed to evaluate the effects of AFB1 and AFM1 exposure on cancer cells in order to verify the correlation between toxin exposure and cancer cell proliferation and invasion. In this review, we summarize the activation pathways of AFB1 and AFM1 and the data already reported in literature about their correlation with cancer development and progression. Moreover, considering that few data are still reported about what genes/proteins/miRNAs can be used as damage markers due to AFB1 and AFM1 exposure, we performed a bioinformatic analysis based on interaction network and miRNA predictions to identify a panel of genes/proteins/miRNAs that can be used as targets in further studies for evaluating the effects of the damages induced by AFB1 and AFM1 and their capacity to induce cancer initiation.

› Curr Microbiol. 2021 Jun;78(6):2420-2428. doi: 10.1007/s00284-021-02509-6.
Epub 2021 May 21.

Production of Mycophenolic Acid by a Newly Isolated Indigenous Penicillium glabrum

Fatemeh Mahmoudian [1], Atefeh Sharifirad [1 2], Bagher Yakhchali [1], Saham Ansari [3], Seyed Safa-Ali Fatemi [4]

Affiliations + expand

PMID: 34019120 PMCID: PMC8138112 DOI: 10.1007/s00284-021-02509-6

Free PMC article

Abstract

Soil-occupant fungi produce a variety of mycotoxins as secondary metabolites, one of which is mycophenolic acid (MPA), an antibiotic and immunosuppressive agent. MPA is mainly produced by several species of Penicillium, especially Penicillium brevicompactum. Here, we present the first report of MPA production by a local strain belonging to Penicillium glabrum species. We screened ascomycete cultures isolated from moldy food and fruits, as well as soils, collected from different parts of Iran. MPA production of one hundred and forty Penicillium isolates was analyzed using HPLC. Three MPA producer isolates were identified, among which the most producer was subjected to further characterization, based on morphological and microscopic analysis, as well as molecular approach (ITS, rDNA and beta-tubulin gene sequences). The results revealed that the best MPA producer belongs to P. glabrum IBRC-M 30518, and can produce 1079 mg/L MPA in Czapek-Dox medium.

Drug Chem Toxicol. 2022 Sep 6;1-11. doi: 10.1080/01480545.2022.2113095.
Online ahead of print.

Mechanisms underlying citrinin-induced toxicity via oxidative stress and apoptosis-mediated by mitochondrial-dependent pathway in SH-SY5Y cells

Mahmoud Abudayyak [1], Ecem Fatma Karaman [2], Sibel Ozden [1]

Affiliations + expand

PMID: 36065904 DOI: 10.1080/01480545.2022.2113095

Abstract

Citrinin (CIT) is a mycotoxin produced as a secondary product by the genera *Aspergillus*, *Penicillium*, *Monascus,* and other strains. CIT has the potential for contaminating animal feed and human food such as maize, wheat, rye, barley, oats, rice, cheese, and sake. Although CIT is primarily known as a nephrotoxic mycotoxin, it also affects other organs, including the liver and bone marrow, and its mechanisms of toxicity have not been clearly elucidated. There is a further lack of studies investigating the potential for CIT-induced neurotoxicity and its mechanisms. In the current study, SH-SY5Y human neuroblastoma cell line was treated with CIT for 24 h to evaluate various toxicological endpoints, such as reactive oxygen species (ROS) production and apoptosis induction. Results indicate that CIT has an IC_{50} value of 250.90 µM and cell proliferation decreased significantly at 50 and 100 µM CIT concentrations. These same concentrations also caused elevated ROS production (≥34.76%), apoptosis (≥9.43-fold) and calcium ion mobilization (≥36.52%) in the cells. Results show a significant decrease in the mitochondrial membrane potential (≥86.8%). We also found that CIT significantly upregulated the expression of some genes related to oxidative stress and apoptosis, while downregulating others. These results suggest that apoptosis and oxidative stress may be involved in the mechanisms underlying CIT-induced neurotoxicity.

Review > Crit Rev Food Sci Nutr. 2020;60(16):2710-2729.
doi: 10.1080/10408398.2019.1655388. Epub 2019 Aug 26.

Occurrence and toxicity of a fusarium mycotoxin, zearalenone

Ankita Rai [1] [2], Mukul Das [1] [2], Anurag Tripathi [1] [2]

Affiliations + expand

PMID: 31446772 DOI: 10.1080/10408398.2019.1655388

Abstract

Zearalenone (ZEA) is a mycotoxin produced by the fungi of *Fusarium* genera, which contaminates the cereals and food stuffs worldwide. *Fusarium* mycotoxins are considered as important metabolites related to animal and human health. Evidences indicate that ZEA has been found to be present in different food stuffs from developed countries like USA, Canada, France, Germany, Japan, etc. and developing nations like Egypt, Thailand, Iran, Croatia, Philippines, etc. The toxicokinetic studies reveal that following oral exposure of ZEA, the compound is absorbed through gastrointestinal tract (GIT), gets metabolized and distributed to different body parts. ZEA has been shown to cause reproductive disorders in laboratory animals. Although the toxicity of ZEA in humans have not been conclusively established nonetheless, limited evidences indicate that ZEA can cause hyper estrogenic syndrome. Though, ZEA causes low acute toxicity, but reports are available confirming the systemic toxicity caused by ZEA. There is no review available that addresses the occurrence, systemic toxicity and the probable mechanisms of ZEA toxicity. This review shall address the world-wide occurrence and *in vivo* & *in vitro* toxicity studies of ZEA over the past 20 years. The review shall also discuss the toxicokinetics of ZEA and metabolites; illustrates the systemic toxicity and probable mechanisms of action leading to the risk associated with ZEA.

Review > Toxins (Basel). 2022 Jan 19;14(2):67. doi: 10.3390/toxins14020067.

Ochratoxin A in Slaughtered Pigs and Pork Products

Mikela Vlachou [1], Andreana Pexara [1], Nikolaos Solomakos [1], Alexander Govaris [1]

Affiliations + expand

PMID: 35202095 PMCID: PMC8876995 DOI: 10.3390/toxins14020067

Free PMC article

Abstract

Ochratoxin A (OTA) is a mycotoxin that is produced after the growth of several *Aspergillus* and *Penicillium* spp. in feeds or foods. OTA has been proved to possess nephrotoxic, hepatotoxic, teratogenic, neurotoxic, genotoxic, carcinogenic and immunotoxic effects in animals and humans. OTA has been classified as possibly carcinogenic to humans (Group 2B) by the IARC in 2016. OTA can be mainly found in animals as a result of indirect transmission from naturally contaminated feed. OTA found in feed can also contaminate pigs and produced pork products. Additionally, the presence of OTA in pork meat products could be derived from the direct growth of OTA-producing fungi or the addition of contaminated materials such as contaminated spices. Studies accomplished in various countries have revealed that pork meat and pork meat products are important sources of chronic dietary exposure to OTA in humans. Various levels of OTA have been found in pork meat from slaughtered pigs in many countries, while OTA levels were particularly high in the blood serum and kidneys of pigs. Pork products made from pig blood or organs such as the kidney or liver have been often found to becontaminated with OTA. The European Union (EU) has established maximum levels (ML) for OTA in a variety of foods since 2006, but not for meat or pork products. However, the establishement of an ML for OTA in pork meat and meat by-products is necessary to protect human health.

Where Do We Get Exposed?

WHOLE HOME & BODY HEALTH

MYCOTOXIN RISK MANAGEMENT

Biomin®

ZEARALENONE SURVEY MYCOTOXINS FEED

World Mycotoxin Survey: Impact 2021

Everything you need to know about upcoming mycotoxin threats to poultry, swine, ruminants and aquaculture worldwide.

25.02.2021

In Brief

In 2020, the most prevalent mycotoxins globally are the Fusarium mycotoxins DON (65%) and FUM (64%), followed by ZEN (48%).

New Mycotoxin Risk Management App

Stay up-to-date with the latest trends in mycotoxins and their impacts on livestock

download now

North America

Risk in North America is extreme. DON is one of the main concerns in all species in North America. It was present in 72% of corn samples and in 89% of cereal samples. Average of positives for DON in corn (maize) was quite high with 808 ppb and even higher in cereals (1,721 ppb). Corn was also affected by FUM and ZEN with averages of 2,405 ppb and 323 ppb, respectively. DDGS (Dried distillers' grains with solubles), a corn by-product, shows high levels of Fusarium mycotoxins. Co-contamination was high, and 92% of the tested samples contained more than one mycotoxin.

Mycotoxin Solutions

Mycofix®

The Mycofix® portfolio of feed additives represents the most state-of-the-art solution for protecting animal health by deactivating mycotoxins that contaminate farm animal feed. Its safety and efficacy are proven by 7 EU...

Mycotoxin Detection

We offer a range of analytical services to customers to assess the mycotoxin contamination of feed materials.

Mycotoxin Risk Management App

Track feed crop contamination levels anywhere in the world on your device

FUMzyme® sol

FUMzyme®, the only enzyme that effectively detoxifies fumonisins safely and irreversibly, is available for post-pellet and liquid application in animal feed. From the creators of Mycofix®. Naturally Ahead.

Mycotoxin Prediction

The Mycotoxin Prediction Service delivers assessments of expected mycotoxin levels in the upcoming harvest of corn (maize) and wheat around the world.

Mycotoxin Contamination

Our portfolio of tools helps to understand the potential risks of mycotoxins for animal species and location.

DSM Mycotoxin Survey

The DSM Mycotoxin Survey constitutes the longest running and most comprehensive data set on mycotoxin occurrence. The survey results provide insights on the incidence of the six major mycotoxins in the agricultura...

Have You?

Dealt with mold exposure personally?

Have clients that have?

Are suspicious?

WHOLE HOME & BODY HEALTH

Every 25 years


FAVORITE LANDLORD/INSPECTOR
SAYINGS

Mold Investigations

Mold Investigations

Industry Standard

- Limited visual assessments
- Air samples in the middle of rooms and one outside
- Recommendations based on limited data

WHOLE HOME & BODY HEALTH

Mold Investigations

804.562.3435 Fax: 804.447.5562

Job Number:	Job Name: **Denton House**
Collected by: **Cathy Cooke**	
Email: **cookecc@gmail.com**	

HMC ID Number	19000869 - 1	19000869 - 2
Sample ID#	1	2
Sample Name	Outdors Front Of House	Bedroom 2
Sample Volume	75 liters	75 liters
Reporting Limit	13 spores/M3	13 spores/M3
Background	2	2
Fragments	13/M3	ND
Fibers		27 /M3
Dander		2133 /M3
Pollen		ND

Organism	Raw Count	Count / M3	% of Total	Raw Count	Count / M3	% of Total
Alternaria	1	13	5.4%			
Ascospores	3	40	16.7%	3	40	75.5%
Aspergillus|Penicillium	2	27	11.3%			
Basidiospores	7	93	38.8%	1	13	24.5%
Bipolaris|Drechslera						
Chaetomium						
Cladosporium	5	67	27.9%			
Curvularia						
Epicoccum						
Fusarium						
Memnoniella						
Myxomycetes						
Pithomyces						
Stachybotrys						
Stemphylium						
Torula						
Ulocladium						
Unspecified Spore						
Total	18	240		4	53	

Water Damage Indicator | Common Allergen | Slightly Higher than Outside Air | Sig

Mold Investigations


FAVORITE LANDLORD/INSPECTOR
SAYINGS


IT'S NOT A PROBLEM
THE AIR SAMPLE IS CLEAN


IT'S NOT A PROBLEM
IT'S DRY


IT'S NOT A PROBLEM
IT'S JUST MILDEW

Mold Investigations

Holistic Inspection

- Complete visual assessment
- Planned, targeted Sampling
- Recommendations based on thorough review

WHOLE HOME & BODY HEALTH

Complete Visual Inspection


DUPONT
Tyvek
400

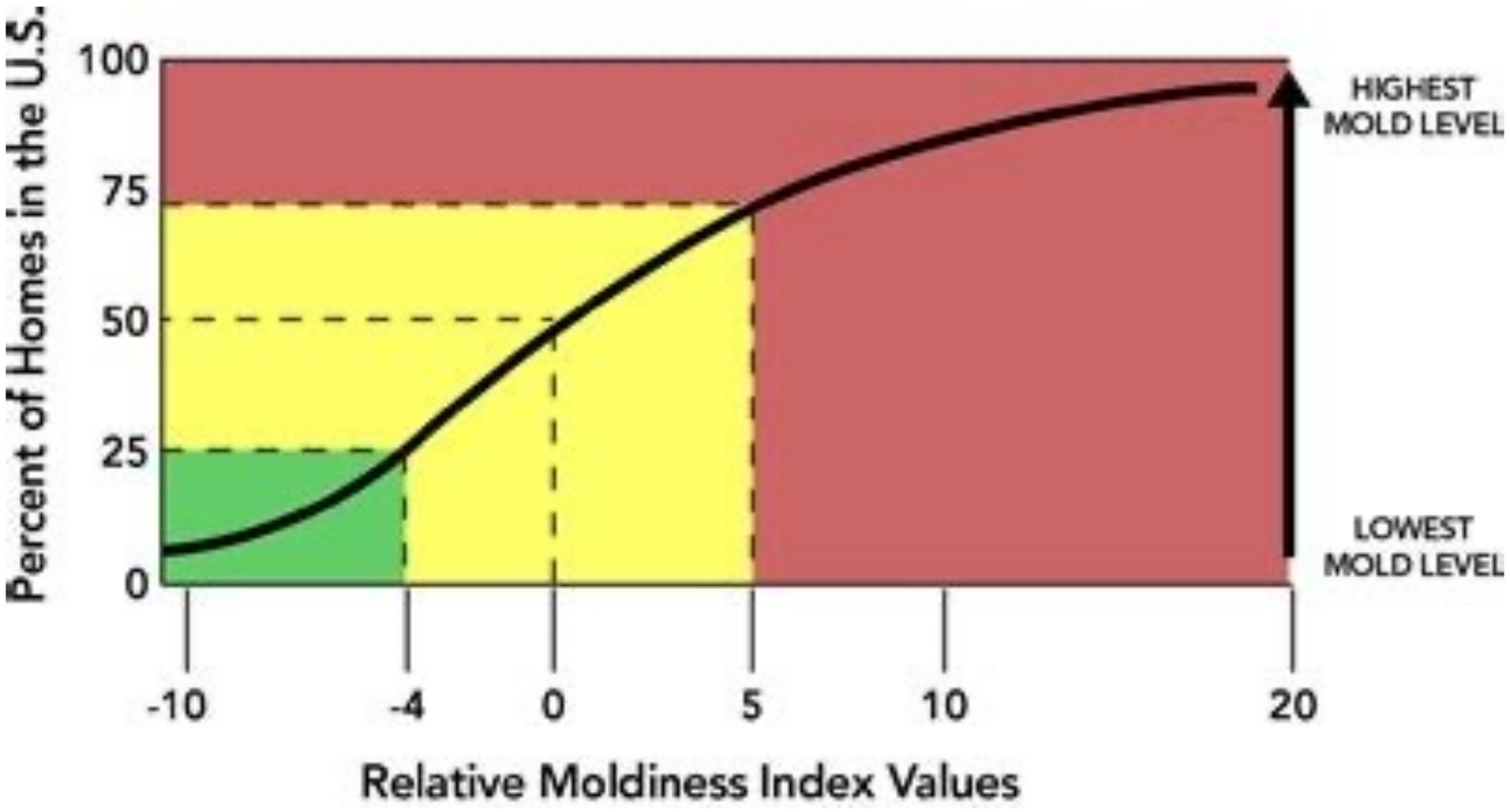

82.4°F
FLIR


MMS2
Protimeter

Sampling

Sampling Strategies

ERMI


Percent of Homes in the U.S.
100
75
50
25
0
-10
-4
0
5
10
20
Relative Moldiness Index Values
HIGHEST MOLD LEVEL
LOWEST MOLD LEVEL

RESULTS

The tables represent the absolute abundance of each mold species detected in the sample reported as mold Species Equivalent per milligram (SE/mg).

Group 1; Water Damage Molds

Species	SE/mg
Aspergillus flavus	N D
Aspergillus fumigatus	1
Aspergillus niger	1
Aspergillus ochraceus	N D
Aspergillus penicillioides	N D
Aspergillus restrictus	1
Aspergillus sclerotiorum	N D
Aspergillus sydowii	1
Aspergillus unguis	N D
Aspergillus versicolor	1
Aureobasidium pullulans	61
Chaetomium globosum	N D
Cladosporium sphaerospermum	2
Eurotium amstelodami	N D
Paecilomyces variotii	N D
Penicillium brevicompactum	21
Penicillium corylophilum	2
Penicillium crustosum	N D
Penicillium purpurogenum	N D
Penicillium spinulosum	N D
Penicillium variabile	N D
Scopulariopsis brevicaulis	N D
Scopulariopsis chartarum	N D
Stachybotrys chartarum	3
Trichoderma viride	N D
Wallemia sebi	4

Group 2; Common Indoor Molds

Species	SE/mg
Acremonium strictum	N D
Alternaria alternata	1,199 *
Aspergillus ustus	N D
Cladosporium cladosporioides1	N D
Cladosporium cladosporioides2	N D
Cladosporium herbarum	N D
Epicoccum nigrum	1,048
Mucor amphibiorum	1
Penicillium chrysogenum	N D
Rhizopus stolonifer	1

SE = Spore Equivalents
SE/mg = SE/milligrams of sample
N D = None Detected

Sample Size	31.4	mg
Mold Score	**-3.0**	

(*) 10 fold higher than normal.
(**) 100 fold higher than normal.
(***) 1000 fold higher than normal.

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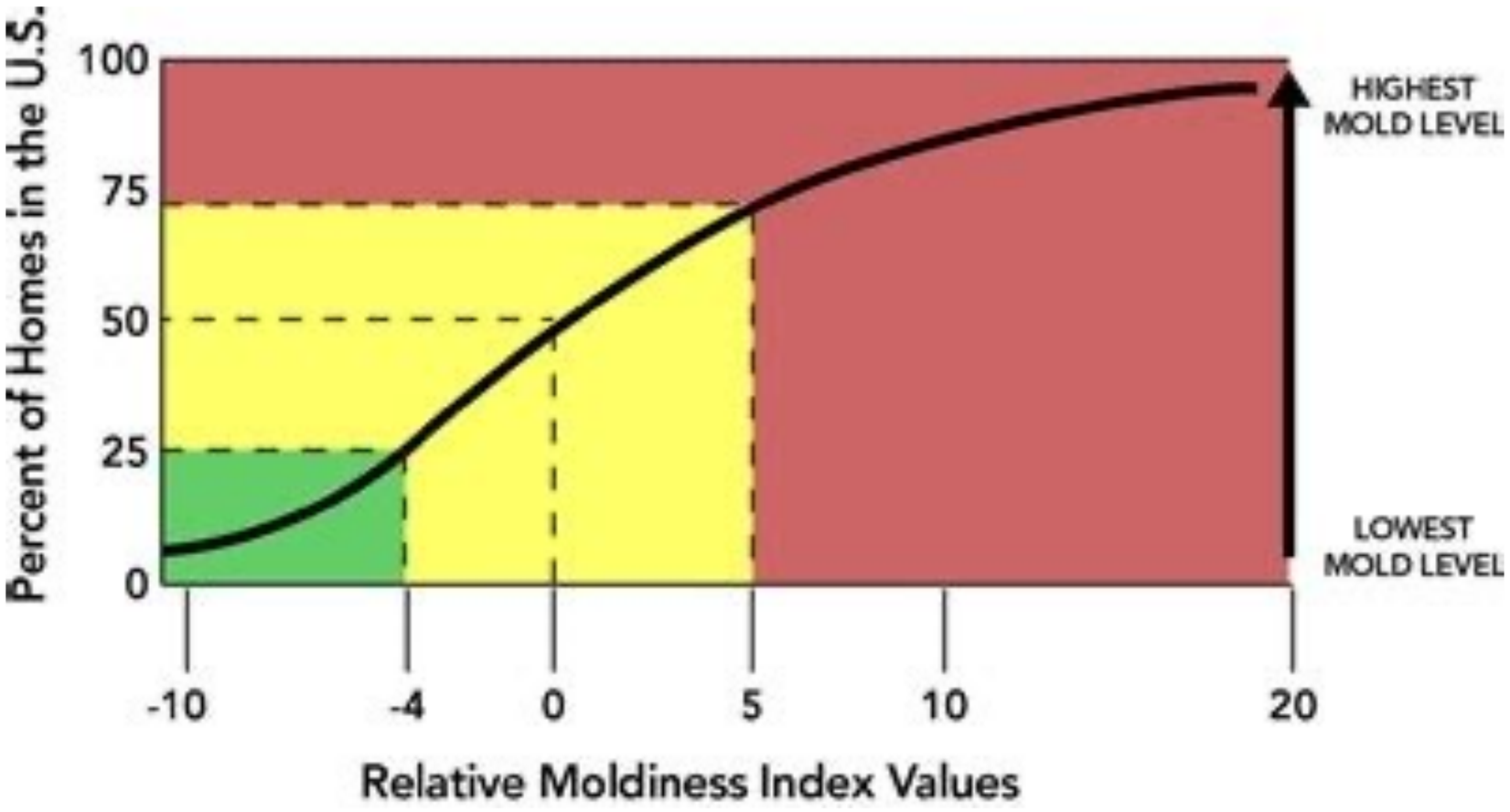
ERMI


Percent of Homes in the U.S.
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-10
-4
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5
10
20
Relative Moldiness Index Values
HIGHEST MOLD LEVEL
LOWEST MOLD LEVEL


FAVORITE PRACTITIONER SAYINGS

It's Not a Problem

Aureobasidium pullulans	61
Chaetomium globosum	N D
Cladosporium sphaerospermum	2
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Paecilomyces variotii	N D
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You're ERMI is Below 2

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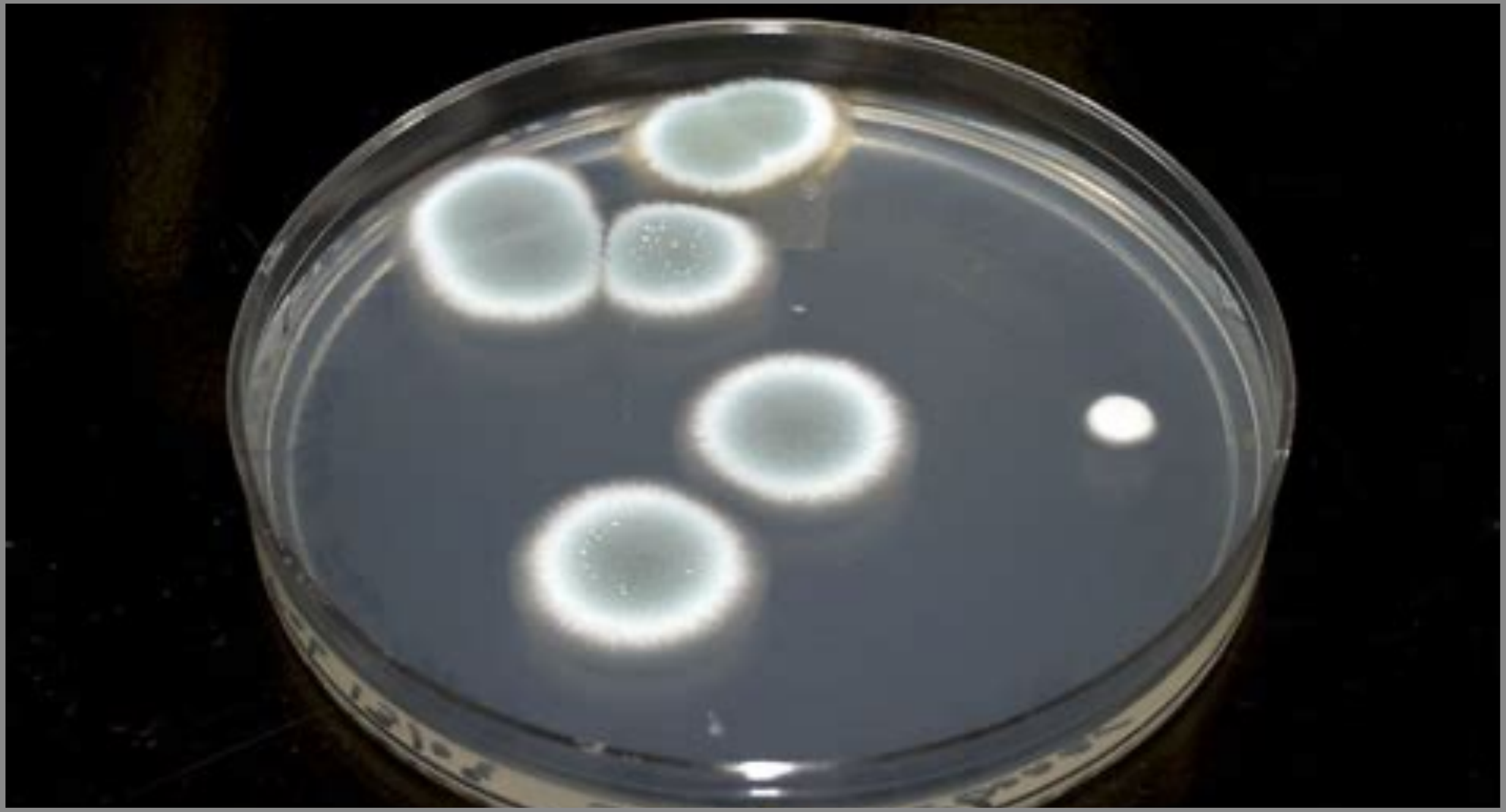
DIY Testing



Direct Sampling

- Tape Lift
- Swab
- Bulk Sample

WHOLE HOME & BODY HEALTH

Direct Sampling

Hiring An Inspector

- How were you trained?
- Are you certified?
- What is your inspection process?
- How do you collect samples?
- How long will the inspection take?
- Do you provide a report?
- How much do you charge? What is included?

WHOLE HOME & BODY HEALTH

Remediation

Now What?

Following proper remediation guidelines….


FAVORITE LANDLORD/INSPECTOR
SAYINGS


DON'T WORRY
I SPRAYED IT WITH KILZ

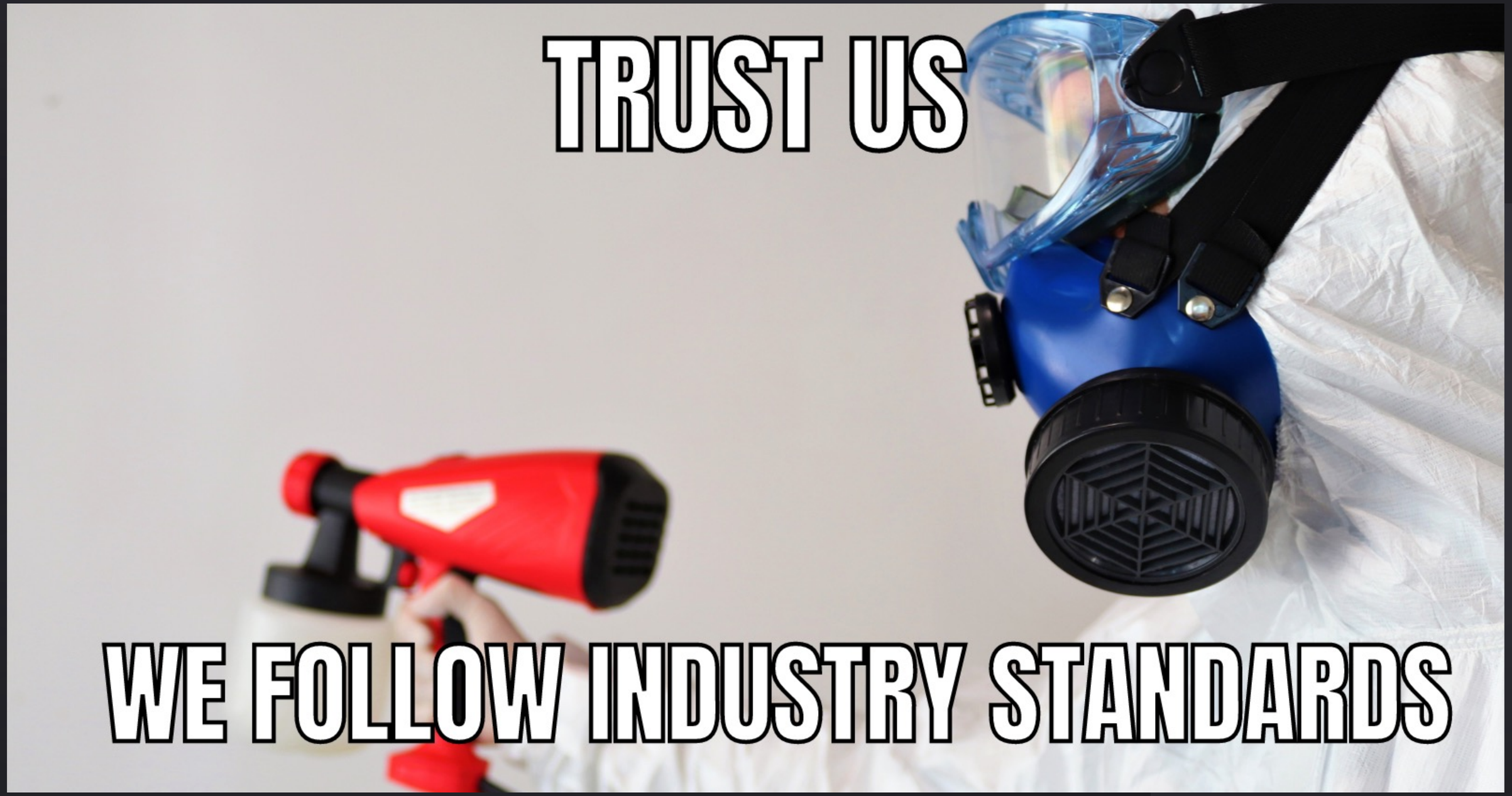
Mold Remediation

Industry Standard

- Remove easily accessible building materials
- Apply antifungal
- Sometimes verify with air sample
- Rebuild

WHOLE HOME & BODY HEALTH


FAVORITE LANDLORD/INSPECTOR
SAYINGS


TRUST US
WE FOLLOW INDUSTRY STANDARDS

ANSI/IICRC **S520**

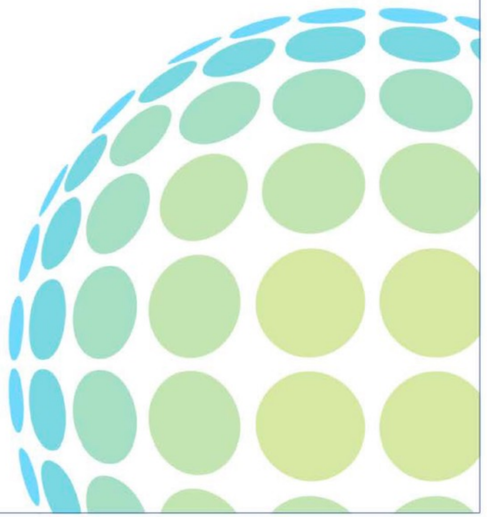
NO FUSS SOLUTIONS
WATER MOLD FIRE STORM

(850) 628-3584

ANSI/IICRC S520-2015

STANDARD FOR PROFESSIONAL MOLD REMEDIATION

Third Edition



Approved American National Standard
ANSI

IICRC
Institute of Inspection Cleaning and Restoration Certification

5.8.1 Chemicals (Antimicrobials and Biocides)

There are a variety of chemical products available for professional mold remediation, and remediators should be familiar with the advantages and disadvantages of using these products along with customer concerns and preferences. Source removal of mold contamination should always be the primary means of remediation. Indiscriminate use of antimicrobials, coatings, sealants, and cleaning chemicals is not recommended.

ANSI/IICRC S520: 2015 Standard for Professional Mold Remediation (p. 20)

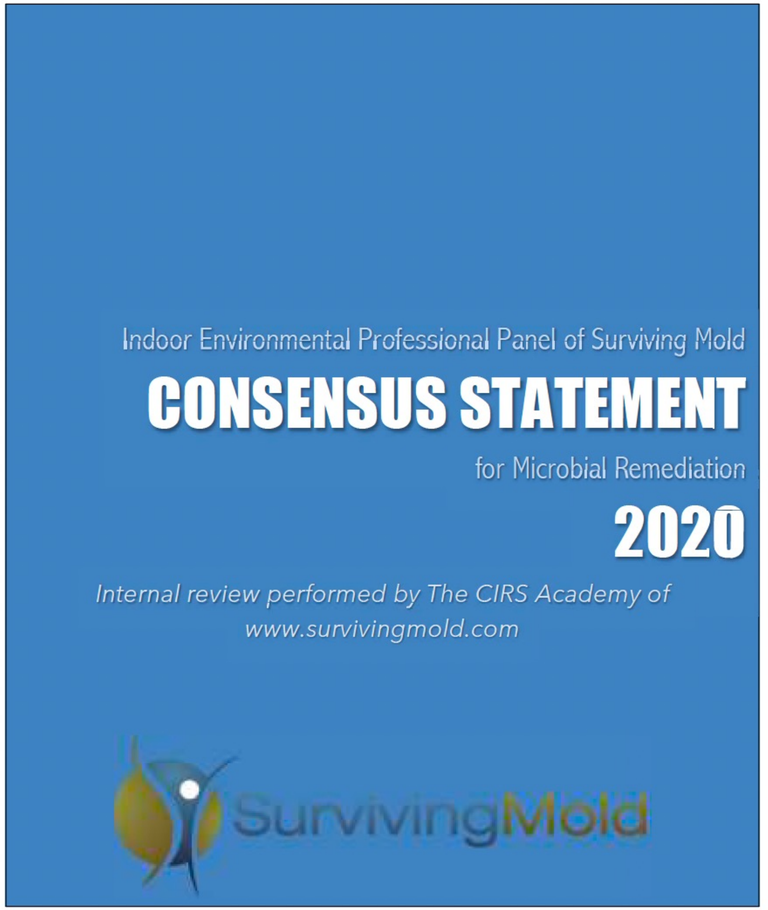
5.8.1.1 Limitations of Use

Antimicrobials should not be used as an alternative to cleaning procedures and physical removal of mold contamination. Some antimicrobials are specifically labeled for both cleaning and disinfecting. However, it is preferable to physically remove both bioburden and soil prior to disinfection. Antimicrobials should only be used in conjunction with proper cleaning, and should not be used indiscriminately. For thoroughly cleaned non-porous building materials, antimicrobials are generally not needed. Antimicrobials should not be relied upon to eliminate the contaminants or contaminated material's allergenic or toxigenic properties.

ANSI/IICRC S520: 2015 Standard for Professional Mold Remediation (p. 20)

EDITORIAL

SURVIVING MOLD INDOOR ENVIRONMENTAL PROFESSIONAL PANEL CONSENSUS FOR MICROBIAL REMEDIATION 2020



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Antimicrobials/Pesticides

The preparers of this document have not found the use of products marketed specifically for eliminating mold to be effective or beneficial, especially when used for medically important remediation.

Antimicrobials/Pesticides

Killing microorganisms does not eliminate the biological material that remains behind…. Microorganisms can most effectively be removed by cleaning them from the environment. This can be accomplished without killing or inactivating them.

The CIRS Academy. et al Medical Research Archives vol 9 issue 1. January 2021 (p. 11)

Comparative Study > J Occup Environ Hyg. 2013;10(1):D11-6.
doi: 10.1080/15459624.2012.740987.

Evaluation of five antifungal agents used in remediation practices against six common indoor fungal species

P Chakravarty [1], Brad Kovar

Affiliations + expand

PMID: 23194080 DOI: 10.1080/15459624.2012.740987

No abstract available

Publication types

> Comparative Study
> Evaluation Study

We investigated the effect of five antifungal agents (Sanimaster, hydrogen peroxide, isopropyl alcohol, bleach, and Sporicidin) used in fungal remediation practices on the growth and spore germination of six commonly occurring indoor fungal species (Alternaria alternata, Aspergillus niger, Chaetomium globosum, Cladosporium herbarum, Penicillium chrysogenum, and Stachybotrys chartarum). These antifungal agents significantly inhibited the growth and spore germination within 12 hr of treatment. When the antifungal agents were washed off with distilled water, no significant differences were observed in spore germination after 24 hr of incubation period. Two weeks after treatment, in vitro fungal growth was not inhibited compared with non-treated control. In the treated wood blocks, colony forming units of these fungi were viable after 2 weeks of treatment.

J Air Waste Manag Assoc. 2008 May;58(5):647-56. doi: 10.3155/1047-3289.58.5.647.

Effect of gaseous chlorine dioxide on indoor microbial contaminants

Nancy Clark Burton [1], Atin Adhikari, Yulia Iossifova, Sergey A Grinshpun, Tiina Reponen

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PMID: 18512442 DOI: 10.3155/1047-3289.58.5.647

Abstract

Traditional and modern techniques for bioaerosol enumeration were used to evaluate the relative efficiency of gaseous chlorine dioxide (ClO2) in reducing the indoor microbial contamination under field and laboratory conditions. The field study was performed in a highly microbially contaminated house, which had had an undetected roof leak for an extended period of time and exhibited large areas of visible microbial growth. Air concentrations of culturable fungi and bacteria, total fungi determined by microscopic count and polymerase chain reaction (PCR) assays, endotoxin, and (1 --> 3)-beta-D-glucan were determined before and after the house was tented and treated with ClO2. The laboratory study was designed to evaluate the efficiency of ClO2 treatment against known concentrations of spores of Aspergillus versicolor and Stachybotrys chartarum on filter paper (surrogate for surface treatment). These species are commonly found in damp indoor environments and were detected in the field study. Upon analysis of the environmental data from the treated house, it was found that the culturable bacteria and fungi as well as total count of fungi (as determined by microscopic count and PCR) were decreased at least 85% after the ClO2 application. However, microscopic analyses of tape samples collected from surfaces after treatment showed that the fungal structures were still present on surfaces. There was no statistically significant change in airborne endotoxin and (1 --> 3)-beta-D-glucan concentration in the field study. The laboratory study supported these results and showed a nonsignificant increase in the concentration of (1 --> 3)-beta-D-glucan after ClO2 treatment.

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Ability of bleach and other biocide treatments to remove and prevent mold growth on Douglas-fir lumber.

Taylor AM, Freitag CM, Morrell JJ

Forest Products Journal, 01 Apr 2004, 54(4):45-49
AGR: IND43691488

Abstract

Molds are an increasingly important issue for all building materials, including wood. While washing with bleach is a commonly recommended method for removing molds, and the associated discolorations, there is surprisingly little information on the effectiveness of this treatment. The ability of mold removal treatments to brighten wood and eliminate fungi was assessed on Douglas-fir (Pseudotsuga menziesii) sapwood lumber heavily colonized with mold and sapstain fungi. The boards were subjected to different washing treatments: wiping with bleach solution, wiping with water, and a no-wash control. Samples were evaluated visually for changes in mold appearance and then fungi were isolated from the surface of the wood. Replicates from the various wash treatments were further treated with three biocide formulations. The effect of the mold control treatments on visual appearance and

…had no effect on the appearance of the wood following the wash treatment, nor did such treatments completely eliminate fungi from the wood surface. The chemical mold prevention treatments tested were not effective in sterilizing the wood, nor did they improve the visual appearance.…

Antimicrobials/Pesticides

If some chemical agent were able to overcome the microbial defenses and kill the spores, there are concerns it would also be harmful to humans or animals; think lead and mercury-based paints and products that have now been outlawed.

The CIRS Academy. et al Medical Research Archives vol 9 issue 1. January 2021 (p. 11)

Antimicrobials/Pesticides

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Antimicrobials/Pesticides

The use of antimicrobials may result in the development of resistant organisms. For example, the use of the antifungal benomyl in paint has resulted in the development of resistant fungal organisms.23 The development of antibiotic resistance after antibiotic treatment is well documented.

Published: September 2002

Relationship Between Growth and Mycotoxin Production by *Fusarium* species, Biocides and Environment

N. Magan, R. Hope, A. Colleate & E.S. Baxter

European Journal of Plant Pathology **108**, 685–690 (2002) | Cite this article

Abstract

Fusarium head blight of cereals has, in recent years, become one of the most important pre-harvest diseases worldwide. This paper examines the *in vitro* efficacy of fungicides to control *Fusarium* species in cereals and the efficacy in the field on both *Fusarium* infection of ripening ears as well as their impact on mycotoxin production. Field studies suggest that fungicides such as tebuconazole and metconazole give good control of both *Fusarium* infection of ears and control of deoxynivalenol (DON) production. However, azoxystrobin and related fungicides are less effective, and grain from treated crops has sometimes been found to have increased concentrations of DON and nivalenol. Studies of isolates of *Fusarium culmorum* from different parts of Europe showed that complex interactions occur between environmental factors, fungicide type and isolate in relation to growth inhibition and DON production. These studies confirmed the ineffectiveness of azoxystrobin and suggest that environmental stress factors, particularly water availability and temperature, and low fungicide doses may stimulate mycotoxin production by Fusaria *in vitro* and in wheat grain.

wheat grain and epoxiconazole was the fungicide residue found in the highest concentration. All fungicidal treatments induced an increase in AFB2 production when compared to the control (without application). AFB1 and deoxynivalenol, on the contrary, were reduced in all fungicide treatments compared to the control.

Mold Remediation

Medical Standard

- Remove all impacted building materials
- Abrasively clean materials that can’t be removed
- Retest with direct samples
- Fine particle cleaning
- Rebuild

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Hiring A Remediation Company

- How were you trained?
- Are you certified? Insured?
- What standards do you follow?
- What is your remediation process?
- How do you handle materials that can't be removed?
- What type of chemicals do you use?
- How do you perform clearance testing?
- Is your work guaranteed?

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Hiring A Remediation Company

- Hire a 3rd Party to oversee the remediation
- Have 3rd Party develop a remediation protocol
- Direct sampling for post clearance testing
- Signed contract you provide

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Agenda

- Basics of mold investigation
  - Industry standards vs. holistic standards
- Mold sampling
  - Air samples, ERMI, Agar plates, direct samples
- Remediation
  - Industry standards vs. holistic standards

Whole Home and Body Health

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