NEXLAB ENVIRONMENTAL
3400 Lakeside Drive, Suite 515
Miramar, FL 33027
786-231-6006

PAT PROGRAMS™
PAT ID: 281926

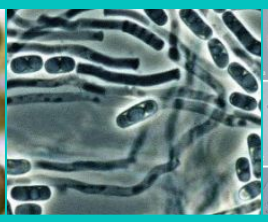
A2LA ACCREDITED
Cert: 5889.01

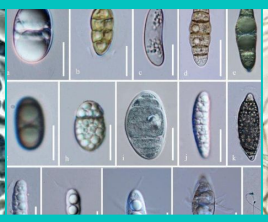
SPORE TYPES

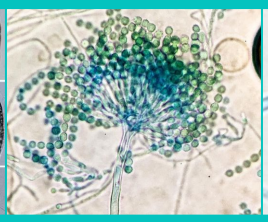
Fungal spore types that are commonly analyzed at Nexlab.

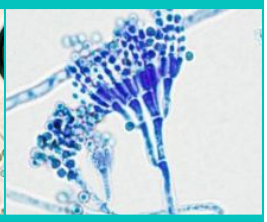

Alternaria

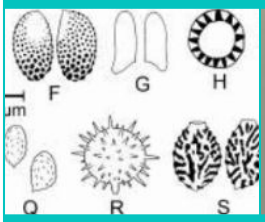

Arthrinium


Arthrospores


Ascospores


Aspergillus


Penicillium

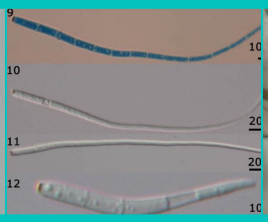


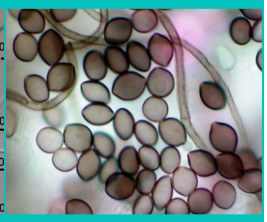
Basidiospres


Beltrania


Bipo/Desch


Botrytis

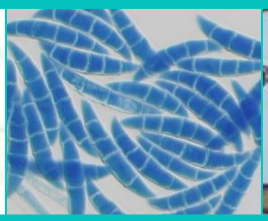

Cercospora

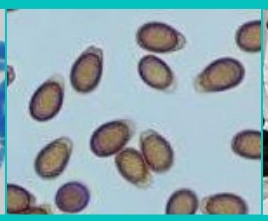

Chaetomium


Cladosporium

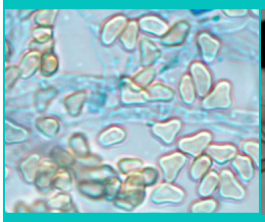

Curvularia

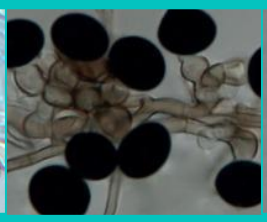

Epicoccum


Fusarium


Ganoderma


Memnionella


Microascus

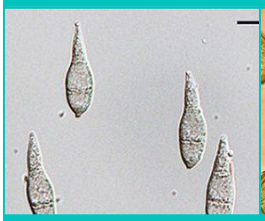

Nigrospora

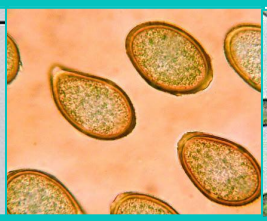

Oidium

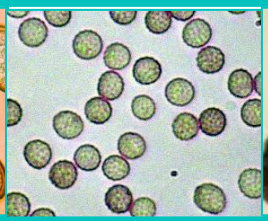

Paecilomyces

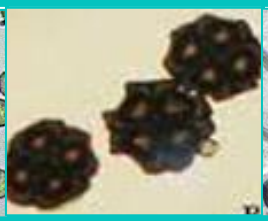

Papulospora


Pithomyces

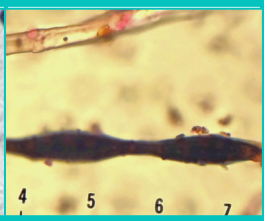

Pyricularia


Rust


Smut

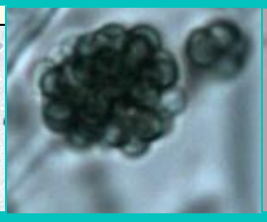

Spegazzinia


Stachybotrys



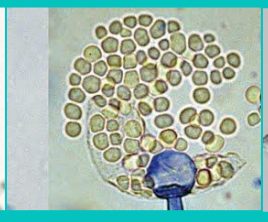
Taeniolella

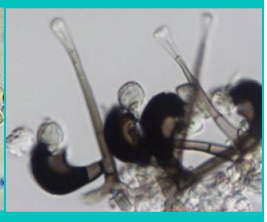

Tetraploa


Trichoderma


Torula


Ulocladium


Zygomycetes


Zygosporium

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All of the following can be identified in an air, tape, or swab sample. Many of them produce mycotoxins, which are toxins that can be on or released by spores even when they are no longer alive. They also release volatile organic compounds responsible for the odors and adverse health effects many people experience.

Microfungi of the Indoor and Outdoor Environment 1 of 3

Identification	Outdoor Habitat	Indoor Habitat	Clinical Significance	Comments
Alternaria	Common everywhere	Damp Cellulose-containing materials	Common Type I (hay fever, asthma), allergic sinusitis	
Arthrinium	Commonly occurs at saprobe on grasses and other plants	Uncommon indoors	Unknown	
Ascospores	Common everywhere. Found in large quantities in the air during summer and after rainfall	With exception of the species Chaetomium, adn Peziza, most common ascospores do not grow indoors	Mostly unknown with the exception of Chaetomium	
Aspergillus/ Penicillium-like	Common everywhere. Grows on nearly everything	Able to grow in nearly any surface containing organic substrates as produce, drywall, wooden surfaces etc.	Type I (hay fever, asthma) allergies and Type III (hypersensitivity pneumonitis) allergies	Spores are highly similar in morphology thus grouped together when seen during analysis
Basidiospores	Mushroom Spores.Commonly found everywhere, especially in the late summer and fall	Unusual to have indoors, but can be found growing in the pots of inside plants	Some allergenicity reported. Type I (hay fever, asthma) and Type II (Hypersensitivity pneumonitis)	This group contains mushrooms that can be particularly destructive to buildings
Bipolaris / Drechslera	Common fungi found in grass and other plants	Uncommon to find indoors	Common Type I (hay fever, asthma)	This group includes spores that have similar morphology and cannot be identified solely on morphology
Botrytis	Common plant pathogen more commonly known for rotting of strawberries and similar fruits	Uncommon to find indoors	Type III (hypersensitivity pneumonitis) allergies “Winegrower’s lung”	

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Microfungi of the Indoor and Outdoor Environment 2 of 3

Identification	Outdoor Habitat	Indoor Habitat	Clinical Significance	Comments
Chaetomium	Normally found in soil, feces, air, Cellulose and plant debris	Can grow on fabric, and damp cellulose-containing building material	Produces mycotoxins that have been reported to be carcinogenic and teratogenic. Type I (hay fever, asthma) allergies and Type III (hypersensitivity pneumonitis) allergies	Can be dangerous to humans when continuously exposed. Can signal underlying chronic moisture problems in the home
Cladosporium	Commonly found everywhere	Can be found inside HVAC vents, bathrooms, damp areas and surfaces	Type I (hay fever, asthma) allergies	
Curvularia	Common everywhere. In the tropics and subtropics on plants as a plant pathogen	Capable of growing on any surface containing cellulose such as wooden cabinets, ceiling tiles and other wooden surfaces	Type I (hay fever, asthma) and common cause of allergenic sinusitis	
Epicocum	Plant pathogen, found in soil and produce	Can grow on produce, damp areas and Cellulose containing material	Type I (hay fever, asthma) allergies	
Fusarium	Commonly found in soil, plant pathogen	Not commonly found indoors	Unknown	
Ganoderma	Basidiospore found in large quantities after rainfall, grows everywhere. Associated with wood decay	Uncommon to find indoors	Type I (hay fever, asthma) allergies	
Memnionella	Commonly found on plants and soil	Damp surfaces such as vents, bathrooms and cellulose-containing surfaces	Type I (hay fever, asthma) allergies	Commonly seen in samples containing stachybotrys spores
Nigrospora	Abundant in warm climates. Ubiquitous	Uncommon to find indoors	Type I (hay fever, asthma) allergies	
Oidium/ Peronospora	Plant pathogen responsible for powdery mildew	Uncommon to find indoors	Unknown	

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Microfungi of the Indoor and Outdoor Environment 3 of 3

Identification	Outdoor Habitat	Indoor Habitat	Clinical Significance	Comments
Paecilomyces	Ubiquitous in soil and grasses	Damp Cellulose-containing material, and produce	Type I (hay fever, asthma) allergies.Type III (hypersensitivity pneumonitis) allergies. Opportunistic infections have been reported	Spores are similar in morphology to Aspergillus and Penicillium spores
Pithomyces	Ubiquitous, in soil and grasses	Uncommon to find indoors	Unknown	
Rust	Ubiquitous plant pathogen	Uncommon to find indoors	Type I (hay fever, asthma) allergies	
Smut/ Myxomycetes/ Periconia	Ubiquitous plant pathogen, found in grass and flowering plants	Uncommon to find indoors	Type I (hay fever, asthma) allergies	
Stachybotrys	Ubiquitous in soil, decaying plants	Damp areas and cellulose-containing surfaces	Type I (hay fever, asthma) allergies	Release mycotoxins that can induce toxicosis on domestic animals and humans
Torula	Ubiquitous, most common in temperate areas. Found in soil and dead or decaying plant matter	Found in cellulose-containing surfaces	Type I (hay fever, asthma) allergies	
Ulocladium	Ubiquitous, found in soil, animal fece, paint, grass	Very damp areas, if present can be widespread in drywall and gypsum board materials	Type I (hay fever, asthma) allergies. Responsible for some opportunistic subcutaneous tissue infections	When present with Alternaria spores, it can increase the level of allergenic effects
Unidentified Spores	Common everywhere. Grow on decaying plant litter and other plant--derived material	Any wooden surface	Unknown	This classification is reserved for spores whose identity have usually never been seen before by our laboratory and/or are of such morphology that they cannot be identified with any degree certainty to a particular genus

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Mold Sampling Methods

The objective of sampling is to assess the levels of mold growth and its intensity within an edifice. There are currently no EPA or OSHA standards for levels of mold or fungi in indoor environments. Additionally there are no standard collection methods though there are several general collection methods that are accepted and available for inspectors to study mold in indoor spaces. Control samples are taken of the outside to compare it to the mold growth on the inside. A high level of mold spores inside of a building might suggest mold growth. The following testing methods are used to detect the presence of mold and fungi. Keep in mind that even though dead, mold spores can still produce allergenic and even toxic effects on humans.

All sampled materials obtaintained in the laboratory is analyzed using microscopic methods, standard and mycological techniques, analyzed at 400x - 600x magnification.

Testing for mold with an accredited laboratory is the best way to assess whether a building had mold and what kind of mold it has.

Air Sampling Methods

Air-O-Cell(AOC) Cassette The AOC spore trap cassette is used with a portable air pump (15 liters/minute for 5 to 10 minutes) to collect airborne aerosols including mold, pollen and other airborne particulates that are impacted on an adhesive slide inside the cassette. These cassettes are efficient at collecting spores as small as 2.6µm. The trace is uneven and large so there is more spread of spores throughout the samples.

Allergenco-D Cassette The Allergenco-D spore trap cassette also uses the same methodology for sample collection as AOCs. These cassettes possess a sharp edge trace, and smaller trace, which makes the analysis time shorter and overall more efficient, as well as being able to collect spores even smaller than the AOCs.

Surface Sampling Methods

Tape (or tape-lift) Tape samples are collected using clear adhesive tape or adhesive slide for microscopic examination of suspicious stains, settled dust and spores.

Swab A sterile cotton or synthetic fiber-tipped swab is used to test an area of suspected mold growth. Samples obtained using this method are analyzed using direct microscopy for genus identification. Identified spores are generally reported as “high, med, low”.

Accredited Laboratory

A2LA has accredited

NEXLAB ENVIRONMENTAL, LLC

Miami Lakes, FL

for technical competence in the field of

Biological Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).

Presented This 8th day of April 2022.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 5889.01
Valid to June 30, 2024

For the tests to which this accreditation applies, please refer to the laboratory's Biological Scope of Accreditation.

References & Resources

Bioaerosols: Assessment and Control, Janet Macher, Sc.D., M.P.H., Editor. 1999. ACGIH, 1330 Kemper Meadow Drive, Cincinnati, OH 45240-1634.

Health Implications of Fungi in Indoor Environments, Edited by R.A. Samson. 1994. Elsevier Science, P.O. Box 945, Madison Square Station, New York, NY 10159-0945

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CDC Mold Frequently Asked Questions
https://www.cdc.gov/mold/faqs.htm
National Institutes of Health - Mold and Remediation
https://www.orf.od.nih.gov/TechnicalResources/ORFPolicies/Pages/MoldPrevPolicy.aspx
National Institute of Environmental Health Sciences - Mold
http://www.niehs.nih.gov/health/topics/agents/mold/index.cfm
American Lung Association: Mold and Dampness
https://www.lung.org

There are currently no Federal regulations for evaluating potential health effects of fungal contamination and remediation. This information is subject to change as more information regarding such contaminants becomes known. This document was designed to follow currently known industry guidelines for the interpretation of microbial sampling, analysis, and remediation. Since interpretation of mold analysis reports is a scientific work in progress, it may as such be changed at any time without notice. The client is solely responsible for the use or interpretation of this report. The Client is hereby notified that due to the changing nature of fungal analysis and the mold growth process, laboratory samples can and do change over time relative to the originally sampled material. NexLAB Environmental reserves the right to properly dispose of all samples 2 months after the testing of such samples are completed.