Mucormycosis

Fungal Infections in COVID-19 Patients

New Introduction

Mucormycosis Detection Kit,
MUCO-diagno™ [K144] is
a complete kit for clinicians to
isolate the fungi responsible for
Mucormycosis from the patient
sample



HiMedia provides the range of exact media for isolating fungi from patient samples in COVID-19 pandemic and their antifungal profiling products

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HiMediaLaboratories™ himedialabs.com

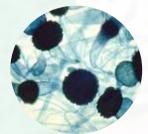
What is Mucormycosis?

Mucormycosis (sometimes called zygomycosis) is a serious but rare fungal infection caused by a group of molds called mucormycetes. These fungi live throughout the environment, particularly in soil and in decaying organic matter, such as leaves, compost piles, or rotten wood.

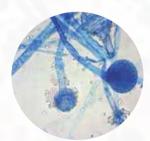
People get mucormycosis by coming in contact with the fungal spores in the environment. For example, the lung or sinus forms of the infection can occur after someone breathes in spores. These forms of mucormycosis usually occur in people who have health problems or take medicines that lower the body's ability to fight germs and sickness. Mucormycosis can also develop on the skin after the fungus enters the skin through a cut, scrape, burn, or other type of skin trauma.

Information Courtesy:

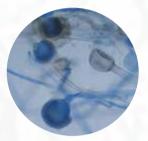
Centers for Disease Control and Prevention (https://www.cdc.gov/)



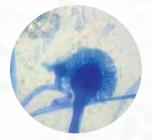
Rhizopus species Source: https://www. austincc.edu/microbugz/ fungi.php



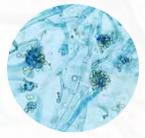
Mucor species Source: https:// dx.doi.org/10.2500/ ar.2016.7.0156



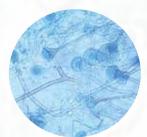
Rhizomucor species Source: https://dx.doi. org/10.1099/jmmcr.0.002931



Syncephalastrum species Source: https://dx.doi.org/10.4103/ idoj.IDOJ_155_18



Cunninghamella bertholletiae Source : https://dx.doi.
org/10.1155/2015/703240



Apophysomyces species Source: https://dx.doi.org/10.1016/j. riam.2014.06.005



Lichtheimia species Source: https://dx.doi. org/10.4103/0971-7749.85806

Mucormycosis Detection Kit, MUCO-diagno™ [K144] is a complete kit for clinicians to isolate the fungi responsible for Mucormycosis from the patient sample

New Introduction



- ▶ "One-Stop" solution for isolation of Mucormycosis fungi
- ► HiFungal Transport Medium preserves fungal specimen till 72 hours
- The unique formulation of MP5476 and MP5477 supports rapid and selective growth
- Lockable plates ensure user's safety

Antifungal susceptibility profiling can be done using Disc/ Ezy MIC™ Strip/ HiComb™

Presumptive identification can be done based on macroscopic & microscopic observations

Observe for the colony characteristics for presence of funga<mark>l growth</mark> affected patient using HiFungal Transport Medium with swab

Mucormycosis **Patient** Sample Collection & Processing

Incubate the plates at ambient temperature (25-30 °C) for 24-48 hrs

Transport the sample to the testing lab

Collection

of the sam<mark>ple from</mark> Mucormycosis

[MS5478]

Spread the sample on each of the Mucormycosis Selective Agar Plate [MP5476] & Candida Selective Agar Plate [MP5477] from the kit

Mucormycosis Detection Kit

MUCO-diagno™

| Ready Prepared Media Provided in the Kit | | |
|--|-------------------------------------|--|
| Code | Product | |
| MP5476 | Mucormycosis Selective Agar Plate 🌼 | |
| MP5477 | Candida Selective Agar Plate 🥌 | |
| MS5478 | HiFungal Transport Medium w/swab 🥌 | |

Media for Isolation of Mucormycosis Fungal Pathogens



Black mould growing on Sabouraud Dextrose Agar Plate [GM063/ MP063GT]

| Ready Prepared Media for General Cultivation | | |
|--|--|--|
| Code | Product | |
| MP063GT | Sabouraud Dextrose Agar Plate (γ-irradiated) (Triple Pack) | |
| MP096 | Potato Dextrose Agar Plate | |

| Ready Prepared Media for Selective Isolation | | |
|--|---|--|
| Code | Product | |
| MP1067 | Sabouraud Chloramphenicol Agar Plate | |
| MP5332 | Sabouraud Dextrose Agar Plate w/ Chloramphenicol and Gentamicin | |
| MP5386 | Sabouraud Dextrose Agar Plate w/ Gentamicin | |
| MP5334 | Sabouraud Dextrose Agar Plate w/ Penicillin and Streptomycin | |
| MP640 | Rose Bengal Chloramphenicol Agar Plate | |

| Ready Prepared Media for Antimicrobial Susceptibility | | |
|---|--|--|
| Code | Product | |
| MP1825 | Mueller Hinton Agar Plate w/2% Glucose | |



White fungus growth on Potato Dextrose Agar [M096/GM096]

| Dehydrated Media for General Cultivation | |
|--|-------------------------------------|
| Code | Product |
| GM063 🎟 | Sabouraud Dextrose Agar, Granulated |
| MV063 | Sabouraud Dextrose HiVeg™ Agar |
| MCD063 * | Sabouraud Dextrose HiCynth™ Agar |
| M096 | Potato Dextrose Agar |
| GM096 🗰 | Potato Dextrose Agar, Granulated |
| MCD096 ☀ | Potato Dextrose HiCynth™ Agar |
| M842 | Rose Bengal Agar Base |
| GM842 🏐 | Rose Bengal Agar Base, Granulated |
| M1467 | HiCrome™ OGYE Agar Base |

Media for Isolation of Mucormycosis Fungal Pathogens

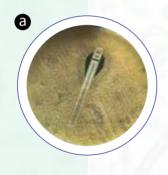


Candida sp. (white fungus) – Green colonies from COVID-19 patient sample growing on differential medium HiCrome™ OGYE Agar Base [M1467]

| Dehydrated Media for Selective Isolation | | |
|--|---|--|
| Code | Product | |
| M1067 | Sabouraud Chloramphenicol Agar | |
| MV1067 | Sabouraud Chloramphenicol HiVeg™ Agar | |
| M1008 | Chloramphenicol Yeast Glucose Agar | |
| M640 | Rose Bengal Chloramphenicol HiVeg™ Agar | |
| MV640 | Rose Bengal Chloramphenicol Agar | |
| M1941 | Potato Dextrose Agar w/ chloramphenicol | |

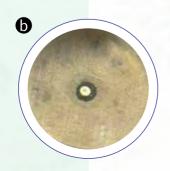
| Dehydrated Media for Antimicrobial Susceptibility | | |
|---|---|--|
| Code | Product | |
| M1825 | Mueller Hinton Agar 2% Glucose w/ Methylene blue | |
| M2067 | HiCrome™ Mueller Hinton Agar (For antifungal testing) | |

Antifungal Susceptibility Testing Resources for Mucormycosis Fungal Pathogens



Antifungal susceptibility testing of black fungus isolates from COVID 19 patient sample using

- a. Antifungal Ezy MIC™ Strip [EM071]
- b. Antifungal Single
 Disc [SD270]
 on M1825/ MP1825
 Mueller Hinton
 Agar Plate w/2%
 Glucose



| Wide range of Antifungal Susceptibility Testing Systems | | | |
|---|-------------------------------------|--------|------------------------|
| Antifungal Ezy MIC™ Strips | | | |
| Antifungal Agent | Concentration | Symbol | Code & Pack Size* |
| Amphotericin B | Range in µg : 0.002 - 32 mcg/ml | AP | EM071-10ST to 150ST |
| Anidulafungin | Range in µg : 0.002 - 32 mcg/ml | AND | EM122-10ST to 150ST |
| Caspofungin | Range in µg : 0.002 - 32 mcg/ml | CAS | EM119-10ST to 150ST |
| Clotrimazole | Range in µg : 0.002 - 32 mcg/ml | CLO | EM144-10ST to 150ST |
| Fluconazole | Range in µg : 0.016 - 256 mcg/ml | FLC | EM072-10ST to 150ST |
| Flucytosine | Range in µg : 0.002 - 32 mcg/ml | FLU | EM118-10ST to 150ST |
| Griseofulvin | Range in µg : 0.002 - 32 mcg/ml | GRI | EM143-10ST to 150ST |
| * Pack Size : ST= Strip | | | |

| Antifungal HiComb™ MIC Test | | | |
|-----------------------------|---|--------|------------------|
| Antifungal Agent | Concentration | Symbol | Code & Pack Size |
| Amphotericin B | Range in µg-A : 32-0.25, B : 0.256-0.002 | AP | MD071-1PK |
| Fluconazole | Range in µg-A : 256-2, B : 2.048-0.016 | FLC | MD072-1PK |
| Ketoconazole | Range in µg-A : 32-0.25, B : 0.256-0.002 | KT | MD074-1PK |
| Itraconazole | Range in µg-A : 32-0.25, B : 0.256-0.002 | IT | MD073-1PK |

Antifungal Susceptibility Testing Resources for Mucormycosis Fungal Pathogens



| Antifungal HiComb™ MIC Strip, Modified | | | |
|--|----------------------------|--------|------------------|
| Antifungal Agent | Concentration | Symbol | Code & Pack size |
| Amphotericin B | Range in µg/ml 0.002 - 32 | AP | MDM071-1PK |
| Fluconazole | Range in µg/ml 0.016 - 256 | FLC | MDM072-1PK |
| Voriconazole | Range in µg/ml 0.002 - 32 | VRC | MDM086-1PK |



Antifungal Sensitivity Discs



| Antifuligat Sensitivity Discs | | | |
|--|---------------|--------|------------------|
| Antifungal Agent | Concentration | Symbol | Code & Pack Size |
| Amphotericin-B | 100 units | AP | SD111 |
| Amphotericin-B | 20 mcg | AP | SD233 |
| Amphotericin-B | 50 mcg | AP | SD270 |
| Clotrimazole | 10 mcg | CC | SD115 |
| Fluconazole | 10 mcg | FLC | SD114 |
| Itraconazole | 10 mcg | IT | SD221 |
| Itraconazole | 30 mcg | IT | SD276 |
| Ketoconazole | 10 mcg | KT | SD224 |
| Ketoconazole | 30 mcg | KT | SD275 |
| Ketoconazole | 50 mcg | KT | SD274 |
| Miconazole | 30 mcg | MIC | SD273 |
| Miconazole | 50 mcg | MIC | SD272 |
| Nystatin | 100 units | NS | SD025 |
| Nystatin | 50 mcg | NS | SD271 |
| "*Packing: 1PK contains 5ct = 5x50 discs in plastic container, | | | |

1VL = contains 100 discs in vial, 5VL = 5x100 discs in vial, 5x50DS = 5 vials of 50 discs each, 5CT = contains 5x50 discs in blister pack"

Antifungal susceptibility testing of White fungus isolates from COVID-19 patient sample using

a. HiComb™ MIC Modified [MDM071]; b. Antifungal Single Disc [SD275];

c. Antifungal Ezy MIC™ Strip [EM071] on Mueller Hinton Agar Plate w/2% Glucose [M1825/ MP1825]

Presumptive Staining for Fungal Isolates



| Stains for Fungi | | |
|------------------|----------------------------------|--|
| Code | Product | |
| S015 | Lactophenol | |
| S016 | Lactophenol Cotton Blue | |
| S017 | Lactophenol Picric Acid | |
| S031 | Mayer's Mucicarmine Stain | |
| S026 | Picric Acid (Saturated, Aqueous) | |

Lactophenol cotton blue preparation of Aspergillus sp.

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