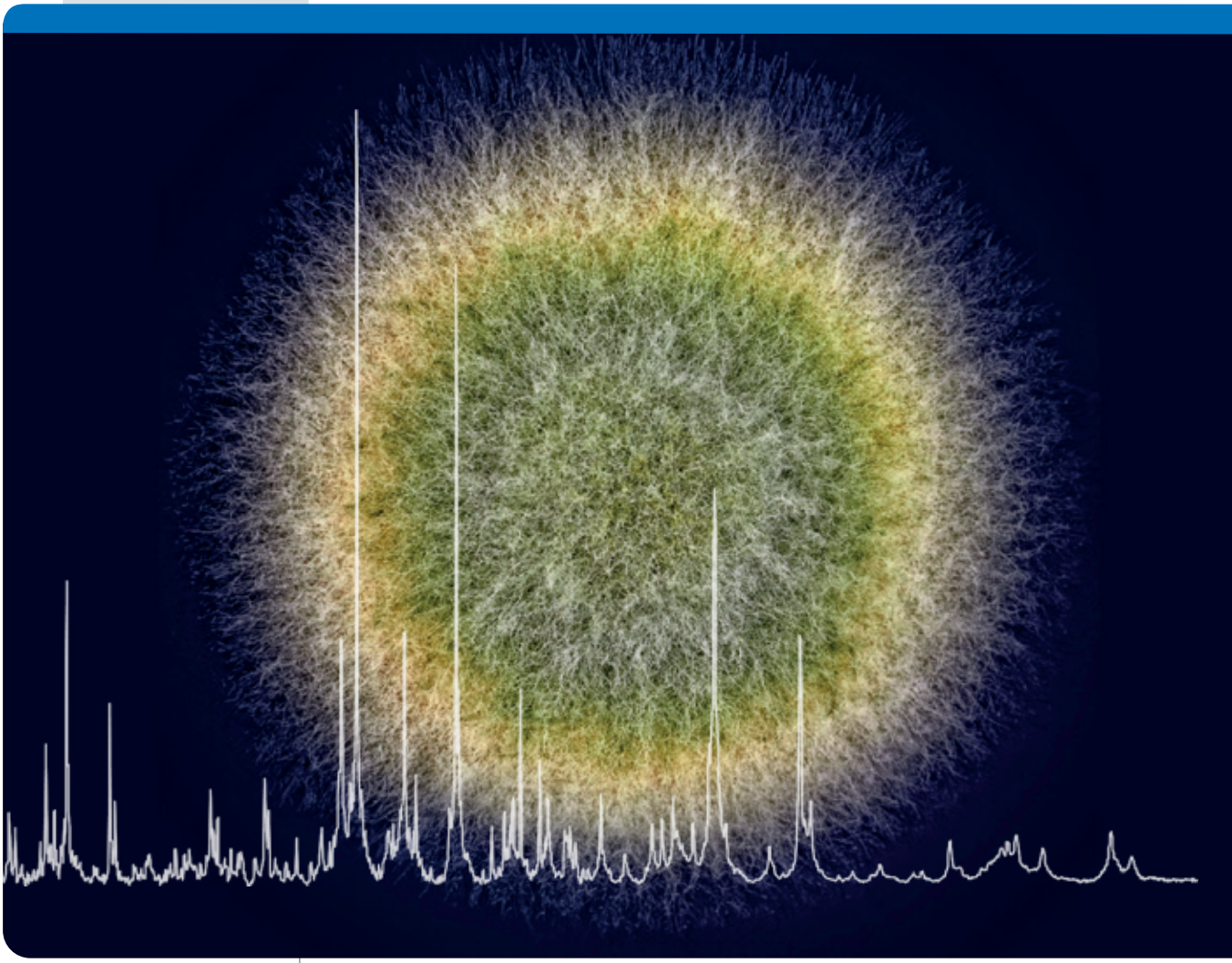
RUO



MBT Filamentous Fungi Library

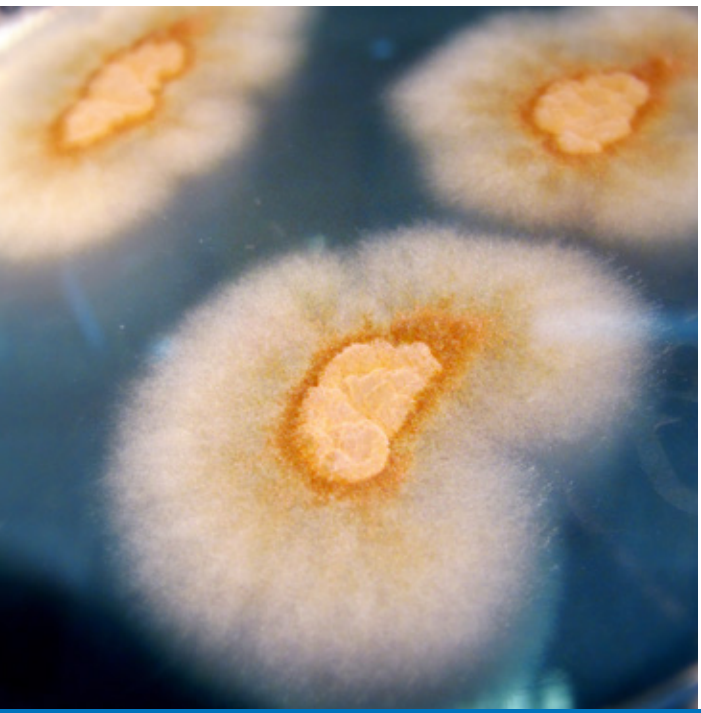
- MALDI Biotyper®

MALDI-TOF

Innovation with Integrity

MALDI Biotyper®

Tackle the filamentous fungi challenge



The MALDI Biotyper has revolutionized the identification of microorganisms within the past decade, setting new standards in speed, ease of use, reliability and cost-effectiveness. But even in these advanced times of microbial mass spectrometry, the identification of molds and multicellular fungi still persists as one of the most challenging aspects of microbiology. This can be mainly attributed to the effects of culture conditions.

To facilitate the identification of these microorganisms, Bruker has developed a cultivation method for the creation of reference spectra for the MBT Filamentous Fungi Library, and a standard three-step workflow for identification.

Standardized liquid cultivation for the creation of the reference library

In order to reduce the effects of culture conditions on the mass spectrum and to aid in the production of a uniform mycelium, a liquid based cultivation method has been developed which standardizes the physiological status. This method has been used to create the MBT Filamentous Fungi Library and is recommended where quick identification using front mycelium is not possible.

To create the reference library, tubes with liquid medium have been inoculated with the fungi and placed on a rotator to incubate overnight or until enough biological material was observed.

Using the standardized liquid cultivation method prevents the germination process and the formation of spores, which, in turn, permits the creation of reproducible library entries.

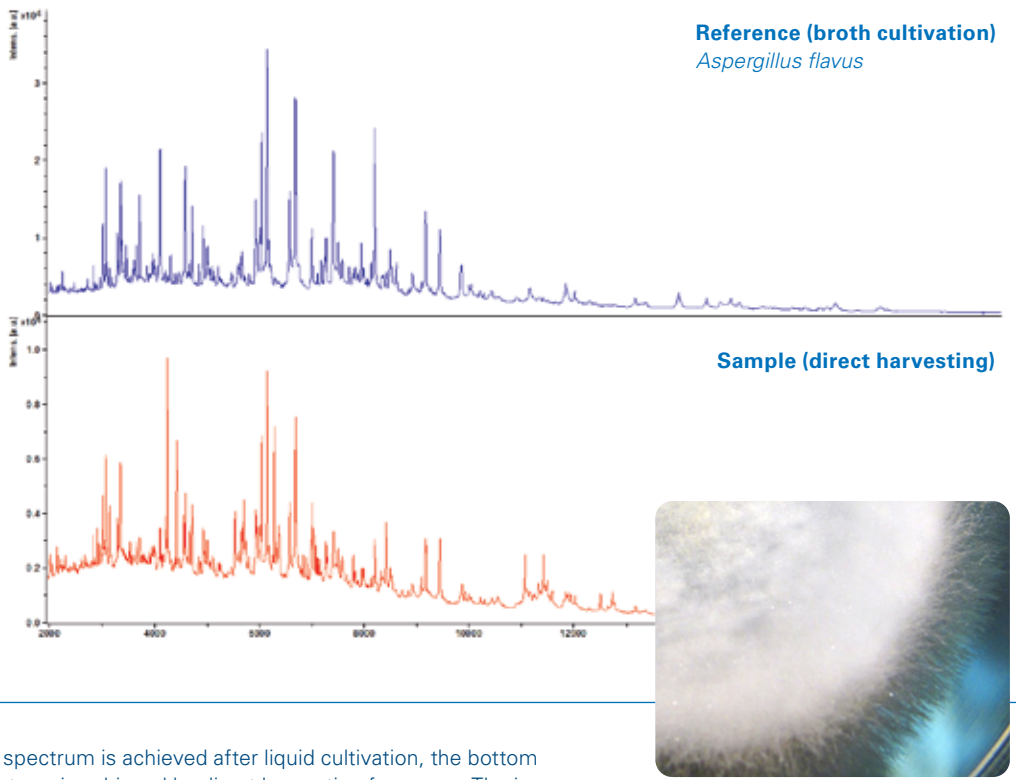
Identification of filamentous fungi by isolation of their mycelium enables fast and reliable species identification.

Daily Routine Workflow – Analysis Possible Directly from Agar

If front mycelium is clearly visible, as in this example, and can be harvested, then it is possible to sample directly from the agar and start with the simple Direct Transfer method / extended Direct Transfer method. Eventually, the extraction method can be used to obtain better results. Usually, good results can be obtained for most of the samples without the need for liquid cultivation.

In cases where direct harvesting is difficult, the liquid cultivation method should be used.

Typical MALDI Biotyper mass spectra

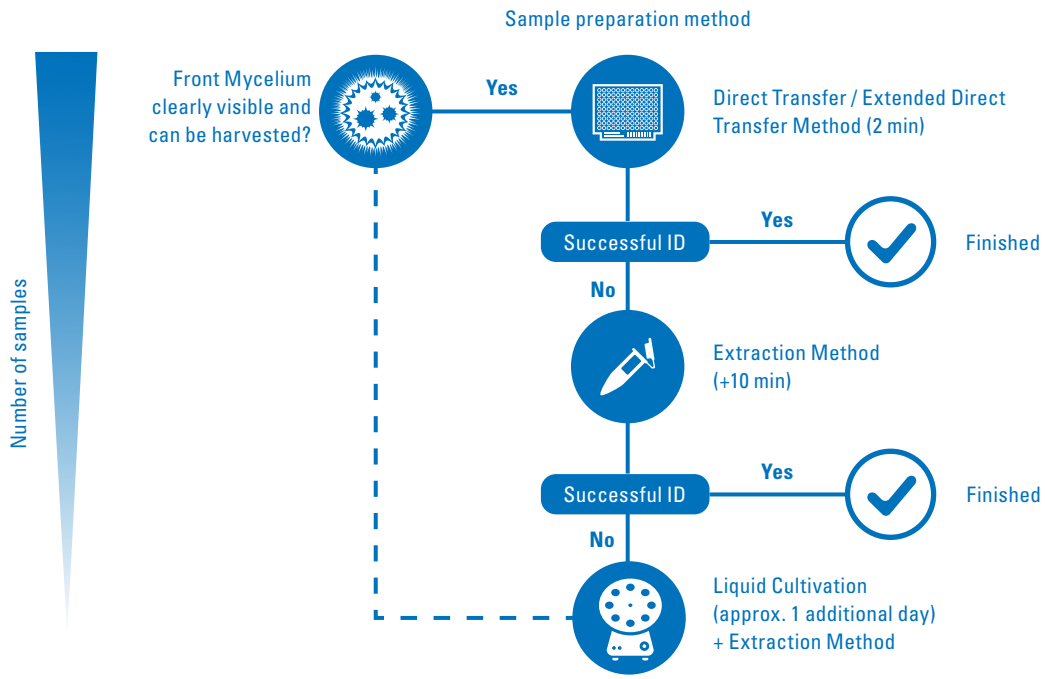


Top spectrum is achieved after liquid cultivation, the bottom spectrum is achieved by direct harvesting from agar. The image shows that the "front mycelium" is clearly visible and can easily be harvested.

A three-step workflow for identification; covering the diversity of filamentous fungi

The fastest identification procedures are the Direct Transfer (DT) and the extended Direct Transfer (eDT) Method, which can conveniently be used in parallel for molds grown on agar plates. These procedures can be used in the majority of the cases if front mycelium is available for harvesting. In case DT / eDT procedures fail to give an identification, as a second option the Extraction (Ext) Method can be used, starting from the same front mycelium.

Standard three-step identification workflow



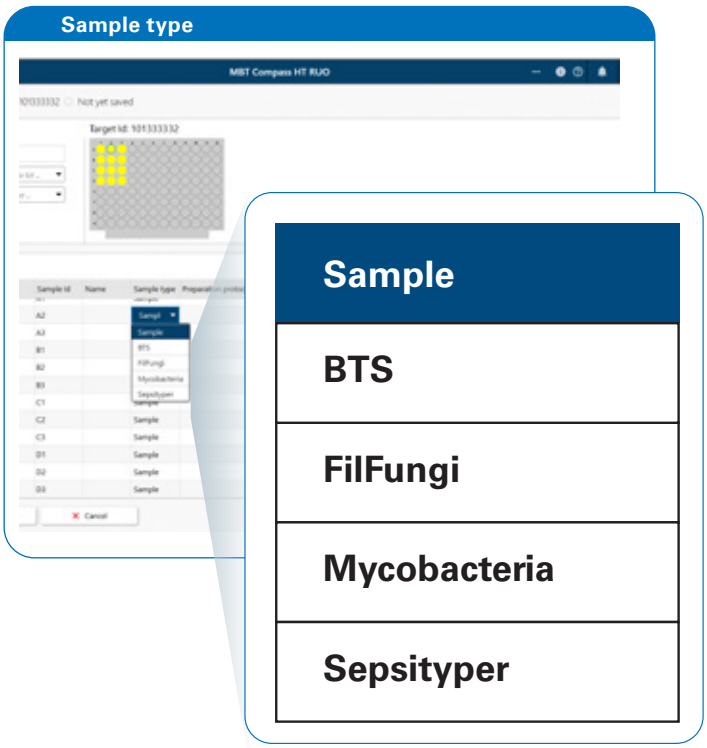
As a further option the so-called "Liquid Cultivation" can be used for filamentous fungi identification. One big advantage of this method is the ability to identify filamentous fungi strains which cannot be harvested from agar plates, due to a solid surface of the fungi or due to their strong adherence to the agar.

Growth in liquid medium is usually very fast and produces biological material in a standardized physiological status after overnight cultivation. The Liquid Cultivation in combination with protein extraction has also been applied to create the MBT Filamentous Fungi Library, which can be used for identification after all mentioned sample preparation techniques (DT / eDT / Ext / Liquid Cultivation), since all generated spectra are compatible with the reference spectra.

More than a library

The MBT Filamentous Fungi Suite combines a comprehensive library with an optimized software module, including adapted thresholds for identification of filamentous fungi.

Optimized data acquisition and analysis contributes to a high identification success rate.



Easy selection of the sample type during sample preparation for optimized data acquisition and analysis

Prof. Dr. med H. Hof,
Mycology Lab, Laboratory of Limbach Heidelberg, Germany

"The identification of multicellular fungi to the species level is one of the most challenging tasks of many microbiological laboratories in medicine, hygiene as well as food industries. In cooperation with Bruker's dedicated microbiology team we worked as part of an international group of fungi experts on the identification of filamentous fungi using the MALDI Biotyper approach.

Based on Bruker's existing development on fungi sample preparation procedure, we contributed, established and validated a reference library of a large panel of the most important fungal strains. Our common efforts during the last years have shown that MALDI-TOF based molecular fingerprints of filamentous fungi provide a high differentiation power both at species and strain level.

The analytical performance of the MALDI Biotyper when used with the Filamentous Fungi Library is a major technological breakthrough and practical improvement when compared to more conventional approaches and technologies using microscopy and sequencing methods only."

MBT Filamentous Fungi Library

The MBT Filamentous Fungi Library 4.0 covers 247 species / species groups, additionally 27 strains can be identified at genus level. Contributions to this library have been received from 34 laboratories across 13 countries.

247 species / species groups

Absidia caerulea	*Arthrographis kalrae*	*Aureobasidium melanogenum*
Absidia glauca	*Aspergillus brasiliensis*	*Aureobasidium pullulans*
Acaulium acremonium	*Aspergillus calidoustus*	*Aureobasidium* sp
Acremonium cereale	*Aspergillus clavatus*	*Beauveria bassiana*
Acremonium chrysogenum	*Aspergillus fischeri*	*Boeremia exigua*
Acremonium curvulum	*Aspergillus oryzae*	*Botrytis aclada*
Acremonium flavum	*Aspergillus flavus*	*Botrytis cinerea*
Acremonium polychromum	*Aspergillus fumigatus*	*Byssochlamys fulva*
Acremonium sclerotigenum	*Aspergillus glaucus*	*Byssochlamys nivea*
Actinomucor elegans	*Aspergillus iizukae*	*Byssochlamys spectabilis*
Actinomucor sp	*Aspergillus japonicus*	*Chaetomium cristatum*
Alternaria alternata	*Aspergillus lentulus*	*Chaetomium globosum*
Alternaria chartarum	*Aspergillus minisclerotigenes*	*Chrysosporium keratinophilum*
Alternaria infectoria	*Aspergillus montevidensis*	*Chrysosporium shanxiense*
Alternaria rosae	*Aspergillus nidulans*	*Cladosporium allicinum*
Alternaria sp	*Aspergillus niger*	*Cladosporium cladosporioides*
Apophysomyces elegans	*Aspergillus nomiae*	*Cladosporium cucumerinum*
Arthrinium arundinis	*Aspergillus ochraceus*	*Cladosporium halotolerans*
Arthrinium phaeospermum	*Aspergillus parasiticus*	*Cladosporium herbarum*
Arthroderma borellii	*Aspergillus penicillioides*	*Cladosporium langeronii*
Arthroderma ciferrii	*Aspergillus pseudoglaucus*	*Cladosporium macrocarpum*
Arthroderma cuniculi	*Aspergillus pulvinus*	*Cladosporium* sp
Arthroderma curreyi	*Aspergillus ruber*	*Cladosporium sphaerospermum*
Arthroderma eboreum	*Aspergillus sclerotiorum*	*Clonostachys rosea*
Arthroderma flavescens	*Aspergillus* sp[4]	*Colletotrichum gloeosporioides*
Arthroderma gertleri	*Aspergillus sydowii*	*Coniochaeta hoffmannii*
Arthroderma gloriae	*Aspergillus tamarii*	*Coniochaeta luteorubra*
Arthroderma insingulare	*Aspergillus terreus*	*Coniochaeta mutabilis*
Arthroderma lenticulare	*Aspergillus tritici*	*Coniochaeta* sp
Arthroderma melis	*Aspergillus unguis*	*Cordyceps farinosa*
Arthroderma multifidum	*Aspergillus ustus*	*Cunninghamella bertholletiae*
Arthroderma thuringiensis	*Aspergillus versicolor*	*Cunninghamella elegans*
Arthroderma uncinatum	*Aspergillus westerdijkiae*	*Curvularia clavata*

247 species / species groups

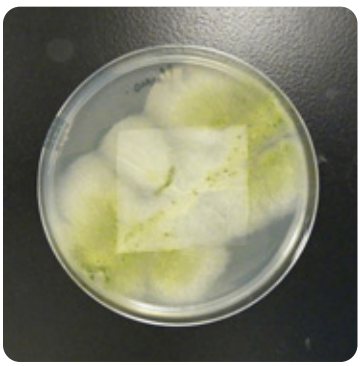
Curvularia fallax	*Fusarium sporotrichioides*	*Mucor racemosus*
Curvularia hawaiiensis	*Fusarium verticillioides*	*Mucor* sp
Curvularia lunata	*Fusicolla aquaeductuum*	*Nannizzia aenigmatica*
Curvularia pallescens	*Fusicolla* sp	*Nannizzia duboisii*
Curvularia verruculosa	*Lasiodiplodia* sp	*Nannizzia fulva*
Dichotomopilus dolichotrichus	*Lichtheimia corymbifera*	*Nannizzia gypsea*
Dichotomopilus funicola	*Lichtheimia ramosa*	*Nannizzia incurvata*
Didymella glomerata	*Lichtheimia* sp	*Nannizzia persicolor*
Didymella pomorum	*Lomentospora prolificans*	*Nannizzia praecox*
Didymella sp	*Metarhizium marquandii*	*Nannizzia* sp
Epicoccum nigrum	*Microascus gracilis*	*Neoscytalidium dimidiatum*
Epicoccum sp	*Microascus melanosporus*	*Neoscytalidium hyalinum*
Epidermophyton floccosum	*Microsporum audouinii*	*Neoscytalidium* sp
Epidermophyton sp	*Microsporum canis*	*Ovatospora brasiliensis*
Exophiala dermatitidis	*Microsporum* sp	*Ovatospora* sp
Exophiala spinifera	*Monascus ruber*	*Paecilomyces laguncularіae*
Fusarium avenaceum	*Monilinia laxa*	*Paraphyton cookei*
Fusarium culmorum	*Mortierella acrotona*	*Paraphyton cookiellum*
Fusarium cerealis	*Mortierella angusta*	*Penicillium aurantiogriseum*
Fusarium chlamydosporum	*Mortierella clonocystis*	*Penicillium brevicompactum*
Fusarium delphinoides	*Mortierella gamsii*	*Penicillium camemberti*
Fusarium dimerum	*Mortierella polygonia*	*Penicillium chrysogenum*
Fusarium equiseti	*Mortierella* sp	*Penicillium citreonigrum*
Fusarium graminearum	*Mucor amphibiorum*	*Penicillium citrinum*
Fusarium incarnatum	*Mucor circinelloides*	*Penicillium commune*
Fusarium oxysporum	*Mucor genevensis*	*Penicillium corylophilum*
Fusarium petroliphilum	*Mucor hiemalis*	*Penicillium crustosum*
Fusarium poae	*Mucor indicus*	*Penicillium digitatum*
Fusarium proliferatum	*Mucor lanceolatus*	*Penicillium expansum*
Fusarium solani	*Mucor moelleri*	*Penicillium fellutanum*

247 species / species groups

Penicillium glabrum	*Sarocladium kiliense*	*Trichoderma fertile*
Penicillium italicum	*Sarocladium strictum*	*Trichoderma hamatum*
Penicillium menonorum	*Scedosporium apiospermum*	*Trichoderma longibrachiatum*
Penicillium nalgiovense	*Scedosporium aurantiacum*	*Trichoderma orientale*
Penicillium namyslowskii	*Scedosporium boydii*	*Trichoderma polysporum*
Penicillium olsonii	*Scedosporium dehoogii*	*Trichoderma reesei*
Penicillium onobense	*Scedosporium minutisporum*	*Trichoderma* sp
Penicillium oxalicum	*Scedosporium* sp	*Trichophyton benhamiae*
Penicillium pimiteouiense	*Schizophyllum commune*	*Trichophyton equinum*
Penicillium roqueforti	*Scopulariopsis brevicaulis*	*Trichophyton erinacei*
Penicillium singorense	*Scytalidium* sp	*Trichophyton eriotrephon*
Penicillium sp	*Sporothrix schenckii*	*Trichophyton interdigitale*
Penicillium turbatum	*Stachybotrys chartarum*	*Trichophyton mentagrophytes*
Penicillium verrucosum	*Stachybotrys chlorohalonata*	*Trichophyton rubrum*
Petriella setifera	*Stachybotrys echinata*	*Trichophyton schoenleinii*
Phaeoacremonium cinereum	*Syncephalastrum monosporum*	*Trichophyton* sp
Phialemoniopsis curvata	*Syncephalastrum racemosum*	*Trichophyton terrestre*
Phoma herbarum	*Talaromyces bacillisporus*	*Trichophyton tonsurans*
Phoma sp	*Talaromyces diversus*	*Trichophyton verrucosum*
Plectosphaerella cucumerina	*Talaromyces duclauxii*	*Trichophyton violaceum*
Pseudogymnoascus pannorum	*Talaromyces funiculosus*	*Trichothecium roseum*
Purpureocillium lilacinum	*Talaromyces islandicus*	*Trichurus spiralis*
Rasamsonia argillacea	*Talaromyces macrosporus*	*Verticillium biguttatum*
Rhizomucor miehei	*Talaromyces pseudostromaticus*	*Zopfiella karachiensis*
Rhizomucor pusillus	*Talaromyces ruber*	*Zopfiella karachiensis*
Rhizopus delemar	*Talaromyces rugulosus*	
Rhizopus microsporus	*Talaromyces* sp	
Rhizopus oryzae	*Talaromyces trachyspermus*	
Rhizopus sp	*Talaromyces wortmannii*	
Rhizopus stolonifer	*Thanatephorus cucumeris*	

Boost your results by Id-Fungi Plates™

Id-Fungi Plates™ are an innovative solution allowing the selective growth of molds, yeasts and dermatophytes for MALDI-TOF analysis, on a specific culture medium with an optimized composition and pH. Its unique membrane limits the contact of the sample with the agar and makes sampling much easier, resulting in generation of better-quality MALDI-TOF spectra and an increased success rate of identified samples.



Aspergillus flavus grown on an Id-Fungi Plate™

Order Information

Part No. 1867813
MBT Filamentous Fungi Suite

Consists of the MBT Filamentous Fungi Library and license for the MBT Filamentous Fungi software module. Prerequisite for the use of the module is the MBT Compass RUO software.

Id-Fungi Plates™ are manufactured by Conidia SAS – France.

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Please contact your local representative for availability in your country.

RUO

As of May 2021, Bruker Daltonik GmbH is now Bruker Daltonics GmbH & Co. KG.

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