Issue 29-June 2025

ISMM MYCOSES Newsletter

Message of the President

Dear Members,

I am humbled and honoured to be selected to serve as the President of the Indian Society of Medical Mycologists or ISMM. I want to extend my sincere gratitude to our society's members in entrusting me with this position. ISMM has now become the premier society in our country's medical mycology field. We are blessed with almost 1000 dedicated members who care deeply about our contributions in the challenging and rapidly evolving landscape of fungal infections. ISMM is a vibrant society bound by shared goals, mutual respect, and a commitment to excellence. I am also fortunate to have the dynamic and sincere Executive Committee (EC) members on my team.

I would like to begin by congratulating Prof. M.R. Shivaprakash and his team in the Mycology Division, Department of Medical Microbiology, at the Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh, on being awarded the European Council of Medical Mycology (ECMM) Excellence Center Diamond Status, jointly with the Department of Pulmonary Medicine. I would like to thank Prof. Jean-Pierre and Prof. Oliver Cornely for auditing and recommending both departments for this award.

I would also like to congratulate Dr. Anupama Jyoti Kindo and her team for successfully conducting the 15th Biennial ISMM National Conference at Sri Ramchandra Medical Institute of Higher Education and Research (SRMC), Chennai from February 21 through February 23, 2025.

Over the next two years, we will try to expand our society's outreach in India even further, especially in Western India. We have already convinced people to conduct CMEs and hands-on workshops to train doctors and researchers on the challenges of diagnosing and treating fungal infections.

In the coming months, my vision is to foster deeper engagement, amplify every voice, and create more growth opportunities for our society. Let us move forward with purpose, pride, and passion.

With warm regards,

Prof. Anup K Ghosh
President, Indian Society of Medical Mycologists (ISMM)

Report of General Secretary

Greetings from ISMM!

Fresh from the success of *ISMM 2025 – 15th National Biennial Conference* (21–23 February 2025, with a pre-conference workshop on 20th February at SRMC-Chennai, steered by Dr. Anupma Jyoti Kindo), I'm delighted to welcome the new Council for 2025–2027. Together, we plan to broaden the Society's reach across India and set ourselves the goal of enrolling 100 new members by 2027.

Acknowledgements & Early Progress

- **Thanks to the outgoing team**: Dr Jayanthi Savio and colleagues raised the bar during their tenure—my sincere gratitude. We extend our deepest gratitude to Dr Arunaloke Chakrabarti, Dr Savitri Sharma, Dr MR Shivaprakash for their constant guidance and support for the advancement of ISMM every year.
- **New leadership**: Under President Dr. Anup Ghosh, we aim to tackle pending tasks and chart fresh goals.
- **EC meetings**: Two online Executive Council meetings have already been held (7 March and 5 June 2025).
- **Registration**: Special thanks to Dr Niranjan Nayak for guiding us through society-registration formalities; minutes were emailed to the Registrar (sdmsaket@gmail.com / subregistrar5a@gmail.com).
- **Website upgrade**: An urgent revamp was approved; Dr Vinay Hallur will curate free, up-to-date mycology resources from national and international sources.
- **GST & DARPAN**: The EC endorsed securing a GST number so future transactions and DARPAN-portal registration proceed smoothly (Treasurer Dr Harsimran Kaur and Dr Ghosh to follow up).
- **Logo usage**: Workshops/CMEs wishing to use the ISMM logo will contribute a 2 % royalty on sponsorship income.

Next National Conference

The 2026 ISMM conference will be hosted by the Department of Microbiology, RIMS-Ranchi, under the leadership of Dr Manoj Kumar.

Mapping Mycology Facilities

Dr. Pratibha Kale and Dr. Gagandeep have launched an online survey to catalogue basic and advanced mycology laboratories across India. The resulting "*Find a Lab. Near You*" map will be featured on our website.

Satellite Awareness Workshops

EC approved one-day outreach workshops for private or newly established medical colleges. A recent hands-on programme at Parul University (Vadodara) drew 140 participants.

Learn Mycology Monthly Classes

Dr. Vinay is finalising a Google form to crowd-source topics for one-hour virtual classes by ID specialists, microbiologists and scientists. A 2025 events calendar will appear soon.

Membership Drive & Student Engagement

- **Target**: Each zonal EC member is asked to recruit five new members by July 2025.
- **Outreach**: Increase ISMM's social-media presence and involve students through webinars, video lectures and podcasts.

Recent global meeting & Upcoming International Event:

Twenty second ISHAM Conference (20–24 May 2025, Iguaçu Falls, Brazil). We now look ahead to **TIMM-12** (12th Congress on Trends in Medical Mycology), 19–22 September 2025 at the Euskalduna Conference Centre, Bilbao, Spain.

Wishing everyone health, happiness, and continued scientific curiosity.

Warm regards,

Prof. Shukla Das,
General Secretary, ISMM

1. **Dr. M. J. Thirumalachar Life Time Achievement Award.**

   The Life Time Achievement award is established to honor members of the ISMM, who during the span of his/her lifetime have demonstrated a longstanding commitment to the cause of Medical Mycology in India. The award is made possible by a generous donation by one of the senior most and revered member of the Society, Dr. Arvind A. Padhye,

   The award would recognize the significant contribution to the understanding and application of the knowledge pertaining to the Medical Mycology in India, over the entire course of his /her life time, with a definable body of work through one or more of the following:-

   - Teaching /Training.
   - Research.
   - Publications/patents.
   - Patient care.

Who may receive the award?

The nominee should be a Life member of the ISMM in good standing, He should be in the field for at least 25 years but not necessarily active professionally at the time of receiving the award.

He must be alive at the time the selection committee's choice is announced. In case of an unfortunate event of death of the awardee after selection, the award may be presented posthumously.

How will the recipients be chosen?

The president, with the approval of the executive committee, will appoint a Life Time Achievement Awards committee consisting of five active members of the Society. One committee member shall be a current member of the ISMM executive council, who would co-ordinate the committee meeting. The committee will invite nominations from the members for the award. The nomination is to be made by at least two life members of the society at least 6 months in advance to the next annual conference of the society. Self-Nomination will not be accepted.

The nominations will be scrutinized by the award committee and the best among the nominations will be selected for the award.

When will the award be presented?

The award may be presented to the deserving individual at the Annual Conference of the Society. The awardee will be introduced to the august gathering duly stating his/her achievements during the inaugural function of the conference.

The award will consist of a citation and a memento.

No travelling or daily allowance will be provided to the awardee to attend the function.

The decision of the award committee will be final.

2. **G. P. Agarwal young scientist Award**

   The best paper award will be given to a young scientist below the age of 35 years (proof of age to be submitted). Applicant must submit the full length original research paper on any area of the medical mycology. Oral presentation of the research should be done in the separate award session during the conference.

3. **Dr. Pankajalakshmi Venugopal Glaxo Meritorious Award**

   Age limit -35 years (proof of age to be submitted). Must submit the curriculum vitae with list of publications and reprints of the papers in the field of medical mycology. Award will be given on the basis of the CV for the outstanding work in the field of medical mycology.

4. **Dr Kamalam Glaxo award in Dermatomycology**

   Applicant must submit full length research paper in duplicate in the field of dermatomycology. Award will be given based on oral presentation in the separate award session during the conference.

Minutes of General Body meeting (GBM)

The General Body meeting (GBM) was chaired by Dr. Jayanthi Savio [JS], President of ISMM in presence of General Secretary, Treasurer, Joint Secretary and the other members of the executive council, held on 22nd February at 12:15 pm in Auditorium, SRMC Chennai. The meeting started with acceptance of the last GBM minutes. This was proposed by Dr Shivaprakash and seconded by Dr. Malini Capoor. All 59 members present for the meeting marked their attendance for records.

The agenda for the meeting was circulated to all members by the general secretary.

1. Acceptance of minutes of the last General Body meeting
2. Presentation of General Secretary's report included key points as addressed below.
3. Presentation of Treasurer's Report
4. New Executive Body – Elections
5. Venue of next ISMM conference

Attendance: A total of 59 members attended the GBM

The following points in the agenda were deliberated:

1. **Acceptance of minutes of the last General Body Meeting:** The minutes of the last general body meeting held at RIMS, Imphal during the 14th ISMM conference were circulated by mail to all the members after the meeting. It was also published in the ISMM Newsletter. The acceptance was proposed by Dr. Shukla Das and was seconded by Dr. Savitri Sharma.
2. **General Secretary's Report was presented by Dr. Anup Ghosh [AG] :** The General Secretary's report was proposed by Dr Shivaprakash and seconded by Dr Malini Capoor. During the presentation, relevant points that required further clarifications were deliberated, for decisions to be taken. The points included the following.

   i. **EQAS Program:** He updated about the EQAS program, 230 laboratories across the country are participating in the ISMM EQAS program in medical mycology conducted by PGIMER. Every year, two batches of samples are sent to the participants by charging INR 5000/-. He also informed that the accreditation process for the EQAS program is underway and Dr. Harsimran Kaur from PGIMER has received training in accreditation of proficiency testing and will be soon initiate the process of accreditation.

   ii. **Academic Activities and other contributions of ISMM:** Dr.AG mentioned that ISMM participated in many activities during the last 2 years and thanked the members who were key resource personnel in the conduct of these activities.

      a. **Workshops and regional Conferences:** Dr. JS thanked the members who conducted these events regularly. She mentioned it is only these activities that will help Mycology in the country to move ahead across all regions.

      b. **ISMM – Pfizer initiative:** Dr. AG informed the members that Pfizer sponsored ~21.3 lakhs to conduct workshops for faculty and students in 4 different regions over one year. The workshop program had been designed for 3 days. We had chosen four different regions for this pilot launch. It included AIIMS New, St John's Medical College, Bangalore (May 2023), TMC Kolkata (June 2023) and NIMS, Hyderabad (July 2023). Dr. Harsimran Kaur updated the members on the financial matter regarding this in her treasurer's report.

   iii. **ISMM Mycoses newsletter:** The council body and GBM

members applauded Dr. Savitri. Sharma [SS], editor ISMM Mycoses newsletter for her continued hard work despite the busy schedule in getting newsletter published twice a year. She again requested all the zonal members to encourage the members of their respective zones to submit abstracts and any updates in the field of mycology to her, anytime of the year so that, it will be easier for her to select from the submitted articles and prevent delay in publishing the issue. GBM decided and requested Dr. SS to continue as the Editor which was well appreciated and accepted.

iv. **Life-time achievement award:** The GBM acknowledged the decision to bestow the Dr.M.J Thirumalachar Life-time achievement award of ISMM to our senior member and past President ISMM, Dr. Savitri. Sharma for her contribution to the field of medical mycology. Dr. JS briefed that the committee reviewed the applications for the award and a neutral opinion from senior members were sought for the final selection.

v. Dr JS informed about the various initiatives and membership drive for increasing membership during past 2 years had led to increase in members with 239 new members joining ISMM.

3. **Treasurer's Report:** Dr. Harsimran Kaur, treasurer ISMM presented the statements for the assessment years 2023-24. This was proposed by Dr Vinay Kumar Hallur and seconded by Dr Anupama Jyoti Kindo. Hard copies were circulated as well as displayed for members' comments. During the presentation of this report she informed the members regarding

Financial assistance provided to ISMM conference at SRMC Chennai.

- **Finances received from Pfizer:** A total of Rs. 21.3 Lakhs was received from Pfizer for conducting the workshop in 4 regions which is mentioned earlier. All centres have already conducted the workshop.
- **Financial corpus:** Dr Arunaloke Chakrabarti requested members for their opinions and suggestions to increase financial corpus.

An amount of Rs 2 lakhs as seed money on a returnable basis is being given to conduct the biennial conference. One of the suggestions was contribution of a part of the surplus amount made during the conference by the organizing secretary to the ISMM corpus.

At this time, Dr. AC also mentioned that the ISMM should tap resources from other International agencies including ISHAM for funding student and conducting workshops and incurring funds from sponsors. He said this would not only bring visibility but also build the corpus and improve mycology related academia in the country.

The acceptance of the treasurer's report was proposed by Dr. Anupama and seconded by Dr. Malini. The members accepted the same.

4. **New Executive Council Body**: Dr Savitri Sharma, the election officer, informed the members of election process. Nominations were invited from members by mail to all for the regional council members. Nominations were received within stipulated time. They were scrutinized for eligibility and the decisions regarding elections were sent out individually to eligible candidate and were informed that they must be present during the GBM for elections.

   A closed ballot voting was conducted for the regional EC members of South and Central regions from where more than one nomination was received. The CVs of the candidates were read for the members before the ballot papers were distributed.

   Once the votes were cast and the papers were collected back Dr. SS informed that counting will be done and the results were announced.

   Regions with single nominations - West (Dr Vijaylata Rastogi) and North (Dr Gagandeep Singh), elected unopposed.

   Dr. JS informed the GB, names of the EC members unanimously proposed for the next council

President: Dr. Anup Ghosh (Professor, Mycology Division, Dept. of Microbiology, PGIMER, Chandigarh)

Vice President: Dr. Malini Capoor (Professor, Dept. of Microbiology, VMMC Safdarjung Hosp, Delhi)

General Secretary: Dr. Shukla Das (Professor and Head Dept. of Microbiology, UCMS, Delhi)

Joint Secretary: Dr. Pratibha Kale (Additional Professor, Dept of Clinical Microbiology, Institute of Liver and Biliary Sciences, New Delhi)

Treasurer: Dr. Harsimran Kaur (Additional Professor, Mycology Division, Dept. of Microbiology, PGIMER, Chandigarh)

Zonal Executive members:

South: Dr. Priyadarshini Padaki

East: Dr. Manoj Kumar

North: Dr. Gagandeep Singh

West: Dr. Vijaylata Rastogi

Central: Dr. Archana Keche

All members unanimously accepted these names for the next council.

Co-opting of a New Post: Dr. JS proposed the creation of a new post to Co-opt a member for **Website and social media.** This was to ensure timely updates on the website and better and supervised communications on the social media platform. The member co-opted was Dr Vinaykumar Hallur proposed by Dr. Shukla Das and Dr. Pratibha Kale seconded the suggestion.

Venue for Next ISMM conference: Dr. Manoj Kumar proposed to conduct the next ISMM 2027 at RIMS, Ranchi. All the members supported and approved Ranchi as the next conference venue.

The meeting concluded with a request to all members to attend the Valedictory ceremony of the 15th ISMM conference during which the members' of the new council would be introduced and assume office.

Thank you & Best wishes from,
Dr. Anup Ghosh
Member Secretary, ISMM (2023-25)

Minutes of meeting of executive committee meeting held on 07/03/2025

The following agenda were discussed during the meeting:

1. **Formal handing over- Taking over of office bearers.**
   Dr Shukla Das discussed about the formal handover and informed that the yearly minutes to be submitted to the Registrar. Dr Anup Ghosh informed that the society documents are maintained at PGIMER and Dr Gagandeep Singh to co-ordinate for the email address of the registrar.
2. **Urgent website upgradation:**
   Dr Shukla Das pointed out that many columns are blank. Dr Vinay Hallur suggested that the latest information from international and national sources/websites pertaining to medical mycology. Upload free resources like books, and articles. Dr Vinay also suggested that photographs related to mycology can be uploaded on the website in the gallery section. Dr Pratibha suggested that we can invite photographs from ISMM members and tagged as best photographs on the website.
3. **The body needs to urgently apply for GST:**

   Dr Anup Ghosh will discuss with the CA and apply for the GST from Chandigarh as soon as possible. Dr Anup to also register under the DARPAN portal. Dr Shukla Das suggested that royalty amount be charged from institutes/societies requesting for ISMM logo to conduct event under the aegis of ISMM. All members agreed to this and a royalty amount of 10% if the conference fund is above 2 lakh and minimum amount of Rs 10,000/- from fund below that or free event.

4. **Change of Signatories to the account**
   Dr Anup Ghosh Informed that any two amongst, the President, General Secretary or treasurer can be signatories.
5. **The annual conference report with pictures to be prepared:**
   Dr Savitri Sharma informed that she has received the conference report and will be published in the upcoming Newsletter. Dr Manoj Kumar suggested that the details of the past council/organizing committee should be included in the conference report. All members agreed to the suggestion.
6. **To constitute a Standing Committee:**
   The committee decided that the Standing committee is currently not needed, and the EC members will handle grievance raised if any.
7. **To invite Zonal workshops:**
   Dr Manoj Kumar informed that he will plan a CME in 2025 and also committed to get new members from his zone. Dr Archana Keche informed that they have conducted a workshop in 2024 and will plan an activity in 2026 and add on members from central zone.
8. **Inviting MOA with sponsors for any study:**
   Dr Shukla Das suggested that we can invite proposals from industry for conducting multicentric studies or kit validation and 50% of the fund received to be added to ISMM account. All members agreed to this.
9. Dr Vinay proposed a Resource links to free mycology services and event page on website to obtain links to conferences, webinars etc. (Eg: JIPMER is holding workshop in April)
   All members agreed to the suggestion and Dr Savitri Sharma and Dr Malini Capoor suggested that we can send an official mail to seek the approval of such organizers where the event is not under the aegis of ISMM. Dr Vinaykumar Hallur suggested of forming a separate subcommittee for handling the social media accounts and proposed name of Dr Arghadip Samaddar to be included. All members agreed to the suggestion.
10. **ISMM excellence centres of Medical Mycology award:**
    Dr Pratibha Kale suggested that an online survey to be conducted for the existing mycology facilities available in India and categorized as Basic and Advanced Mycology centres. Dr

Gagandeep Singh suggested that the centre wise information can be mapped on the website to find "lab near you". All members agreed to the suggestions.

11. **Annual meet: (2026) a. Theme b. Scheduled dates c. Venue d. Fund generation**
    Dr Manoj Kumar informed that the details will be discussed in the next meeting after deliberation with the local organizing committee.
12. **Discussion on applying for funding for Working Groups financial support by ISHAM:**
    Dr Anup Ghosh suggested that we could apply form funding from ISHAM. Dr Jayanthi Savio suggested that we can propose a working group on Chronic pulmonary aspergillosis to ISHAM and on approval we can ask for funding. All members agreed to the suggestion.
13. **Discussion on the "Declaration" and how to proceed further.**
    Dr Jayanthi Savio informed that the initial draft is ready and will further refine with team and then circulate in the council.
14. Dr Harsimran Kaur informed that some amount from the balance fund shown in the GBM is to be disbursed for previous workshop activities and will update on the account balance.
15. Dr Malini Capoor suggested to extend the date of discounted registration to 31st March. The EC members discussed on offering life membership for the students. All agreed to these suggestions.

Dr Shukla Das thanked all the members for their valuable suggestions and ended the meeting.

Thank you & Best wishes from,

Dr. Shukla Das

Minutes of meeting of executive committee meeting held on 05/06/2025

The following agenda were discussed during the meeting:

1. The following schedule of events was shared and approved.

Month 2025	Event
April	Advance National workshop on medical mycology (JIPMER Dr Rakesh Singh) & Guwahati medical college by PGI & Dr Reema Nath
May	Google Survey & ISHAM conference Webinar: Dr Malini R Capoor (Invasive candidiasis) for NBE
June	Satellite workshop at Vadodara Dr Shukla Das and Dr Pratibha Kale
July	Advanced Mycology Workshop and CME at St John's Medical College and Hospital, Bengaluru. Dr Jayanthi Savio and Dr Priyadarshini Padaki
August	Release of Preconference flyer (RIMS Ranchi)
September	15-19 FDAW ISMM Webinar Series
October	Satellite Workshop at Salem Dr Shukla Das and Dr Pratibha Kale IAMM MICROCON 2025
November	Indore CME, Dr Anju Mahor
December	CME Fungal Infections (CIDS & ISMM, DELHI)
March 2026	FISF MYCOCON

2. Once a month under the proposed **LEARN MYCOLOGY** classes we will invite clinical case presentations or just one hour lecture session (by ID specialists /microbiologists/scientists). Dr Vinay has informed that google form for need based assessment has been approved regarding desirable topics on mycology.
3. To activate website: add events, collaborations, workshops funding and career opportunities. Dr Vinay will take it forward with the webmaster.
4. Zonal leaders / EC members were requested to increase membership number and conduct one day CME / workshops.
5. Update on Declaration on fungal infections. The team will follow up this matter with Dr Arunaloke Chakrabarti.
6. Preconference flyer to be launched by Dr Manoj EC member, Ranchi (with theme, schedule, date, sponsors)
7. Google mapping: ongoing survey by Dr Pratibha, Dr Gagandeep. This will be shared with ISMM members for a feedback and circulation.
8. For Excellence award criteria: Design a form and invite applications based on the type of labs.
9. The first minutes of meeting have been sent to registrar office
10. List of lifetime achievement awardees will be updated, Dr Shivaprakash gave names of the recipients and list to be completed by next meeting.
11. GST update given by Dr Anup Ghosh and confirmed that application is under process.
12. The committee decided that all the zonal EC members to expedite membership drive and add 5 members till July 2025.
13. Newsletter: All members were requested to share contents with Dr Savitri Sharma for the upcoming newsletter.

Dr Shukla Das thanked all the members for their valuable suggestions and ended the meeting.

Thank you & Best wishes from,

Dr. Shukla Das

Unusual Dual Infection by *Trichophyton rubrum*: A case of Endonyx Onychomycosis with Endothrix Tinea Capitis

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Introduction

Dermatophyte infections of the scalp and nails—tinea capitis and onychomycosis, respectively—are common superficial mycoses, but their concurrent occurrence in adults is uncommon, particularly in immunocompetent individuals.[1] *Trichophyton rubrum* is a prevalent cause of cutaneous and nail dermatophytosis but is rarely implicated in scalp infections, which are more typically caused by *T. tonsurans* and *T. violaceum*.[2] Endothrix tinea capitis and endonyx onychomycosis are distinct, non-inflammatory patterns of fungal invasion confined to the hair shaft and nail plate, respectively.

We report a rare case of *T. rubrum*-induced endothrix tinea capitis and endonyx onychomycosis in an immunocompetent adult female, highlighting the pathogen's potential for multifocal keratinized tissue involvement and the role of autoinoculation in disease spread..

Case report

A 35-year-old immunocompetent woman, resident of Delhi, presented to the Dermatology outpatient department with a two-year history of progressive nail dystrophy involving the left index fingernail. The nail changes were associated with mild pruritus and alopecia localized to the anterior central parting of the scalp. The condition initially began with the development of ringworm-like lesions over the thighs and legs. For this, the patient received three intramuscular injections of triamcinolone acetonide, administered two weeks apart, along with some unspecified topical medications, for which medical records were not available. This resulted in partial improvement initially, but the lesions worsened following discontinuation of therapy. Subsequently, she consulted a dermatologist and was prescribed oral itraconazole 100 mg twice daily along with topical amorolfine cream. This regimen led to complete resolution of the cutaneous lesions. However, the nail dystrophy and scalp involvement persisted despite treatment. On further questioning, she reported prolonged close contact with her pet cat. Additionally, her young daughter had recently developed nail discoloration, although no treatment had been initiated in the child.

Clinical examination revealed a well-demarcated patch of nonscarring alopecia with mild perifollicular scaling along the frontal midline parting of the scalp, and diffuse whitish discoloration of the left index fingernail with loss of surface luster, lamellar splitting, and no subungual debris or onycholysis (Figure 1). Trichoscopic examination of the scalp revealed corkscrew hairs, comma hairs, and black dots (Figure 2a). Onychoscopic examination of the affected left index fingernail demonstrated white cloud-like structures with extensive irregular branching at the borders, showing a dendritic pattern (Figure 2b). Further examination of the distal nail plate showed white, shiny areas confined to the nail plate. Routine hematological and biochemical investigations were within normal limits.

Clinical specimens including nail clippings, scalp scrapings, and plucked hair were collected for mycological analysis. Direct microscopy of the nail sample using a 40% potassium hydroxide (KOH) mount revealed numerous thin, septate hyphae (Figure 3a). A 10% KOH mount of plucked hair demonstrated fungal spores within the hair shaft (Figure 3b). Fungal culture was performed on Sabouraud dextrose agar supplemented with chloramphenicol (0.05 mg/mL) and cycloheximide (0.5 mg/mL), and incubated at 28°C in a BOD incubator. Cultures were monitored thrice weekly for fungal growth. The culture showed slow-growing, white to cream-colored, cottony to velvety colonies (Figure 4a) with a characteristic deep red to wine-colored pigment on the reverse side of the colony (Figure 4b) after 14 days. Microscopically, lactophenol cotton blue (LPCB) mounts revealed numerous slender, septate hyphae with teardrop- or club-shaped microconidia borne singly along the sides of the hyphae along with sparse, smooth-walled, pencil-shaped, and multiseptate macroconidia (Figure 5). Based on the clinical presentation, dermoscopic features, and mycological findings, the patient was diagnosed with endonyx onychomycosis and endothrix tinea capitis, caused by *T. rubrum*.

The patient was initially treated with oral itraconazole 100 mg twice daily for a total duration of four months. However, there was minimal improvement in both nail and scalp involvement. Due to the poor clinical response, therapy was switched to oral griseofulvin (ultramicrosize) 250 mg twice daily. After three months of griseofulvin therapy, the patient demonstrated marked clinical improvement, with complete resolution of both scalp and nail lesions (Figure 6).

Discussion

Onychomycosis and tinea capitis are two of the most common superficial fungal infections caused by dermatophytes. Their simultaneous occurrence in an immunocompetent adult is uncommon, especially when both are due to *Trichophyton rubrum*, a dermatophyte classically associated with skin and nail infections but rarely causing scalp involvement. This case illustrates a rare and diagnostically significant presentation of endonyx onychomycosis and endothrix tinea capitis, both caused by *T. rubrum*.

Onychomycosis is clinically classified into five subtypes based on the route of fungal invasion: distal and lateral subungual (DLSO), proximal subungual (PSO), superficial white (SWO), endonyx, and total dystrophic onychomycosis. Endonyx onychomycosis, a less frequent subtype, is characterized by fungal invasion limited to the nail plate with no involvement of the nail bed or periungual tissues, and typically presents with lamellar splitting and chalky-white discoloration but minimal subungual debris or onycholysis. It is most commonly associated with endothrix-forming anthropophilic dermatophytes such as *T. soudanense* and *T. violaceum*, which are also known causes of tinea capitis.[3] In our patient, *T. rubrum* was identified as the pathogen, emphasizing its underrecognized potential to cause endonyx infection.

Tinea capitis primarily affects children, but up to 3–11% of cases may occur in adults, particularly elderly females.[4,5] The black dot variant, resulting from endothrix invasion (presence of fungal spores within the hair shaft), causes hair fragility and breakage at the scalp, visible as black dots on clinical and dermoscopic evaluation. While *T. tonsurans* and *T. violaceum* are the usual culprits in adult cases[6,7], *T. rubrum* accounts for less than 1% of childhood tinea capitis cases, though it may cause over 10% of cases in adults.[8] In our case, *T. rubrum* was confirmed on culture, and dermoscopy demonstrated comma hairs, corkscrew hairs, and black dots, supporting the diagnosis of endothrix tinea capitis.

The concurrent presence of scalp and nail dermatophytoses in this patient points to autoinoculation, a well-recognized mechanism in dermatophyte spread. The patient's history of scratching pruritic skin lesions on the lower limbs, followed by scalp and nail involvement, supports this hypothesis. Scratching of infected sites can lead to transfer of fungal elements under the fingernails, facilitating their spread to distant keratinized areas such as the scalp and nails.[9] This mechanism is further corroborated by the sequence of disease progression in our patient and emphasizes the need for comprehensive examination and treatment of all potential fungal sites to prevent recurrence or progression.

There are striking ultrastructural similarities between endothrix and

endonyx infections. Both involve dermatophyte invasion confined to keratinized structures (hair shaft in tinea capitis, nail plate in onychomycosis) without inflammation of adjacent tissues. This shared mechanism reflects the ability of certain dermatophytes, particularly *T. rubrum*, to persist in immune-privileged keratinized niches, evading host defences while utilizing keratin as a nutrient source.

This case highlights the utility of non-invasive tools like trichoscopy and onychoscopy, which revealed classic signs of dermatophytosis—comma hairs, black dots, corkscrew hairs on scalp dermoscopy, and white cloud-like structures with irregular dendritic margins on nail dermoscopy. Mycological culture on Sabouraud dextrose agar confirmed *T. rubrum* from both scalp and nail specimens.

Initial therapy with oral itraconazole 200 mg twice daily for four months failed to elicit improvement, likely due to limited drug penetration in keratinized tissue or possible antifungal resistance. Notably, oral griseofulvin (ultramicrosize) 250 mg twice daily led to complete clinical resolution within three months, reaffirming its effectiveness for tinea capitis and nail dermatophytosis due to its keratinophilic properties.

This case underscores the evolving epidemiology of tinea capitis in adults and the uncommon but significant role of *T. rubrum* in endothrix and endonyx infections. The possibility of autoinoculation via scratching highlights the importance of recognizing early skin involvement, educating patients on hygiene, and ensuring systemic therapy targets all affected areas. A high index of suspicion and combined dermoscopic, mycological, and clinical correlation are essential for prompt diagnosis and appropriate management of such atypical dermatophyte infections.

Figure 1: A well-demarcated patch of nonscarring alopecia with mild perifollicular scaling along the frontal midline parting of the scalp, and diffuse whitish discoloration of the left index fingernail with loss of surface lustre, lamellar splitting, and no subungual debris or onycholysis.

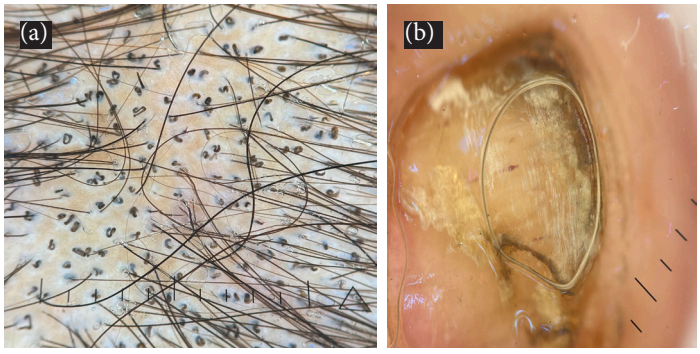

Figure 2: (a) Trichoscopic examination (Heine DELTAone) of the scalp showing corkscrew hairs, comma hairs, and black dots; (b) Onychoscopic examination (Heine DELTAone) of the affected left index fingernail showing white cloud-like structures with extensive irregular branching at the borders, showing a dendritic pattern (Polarized, x20).

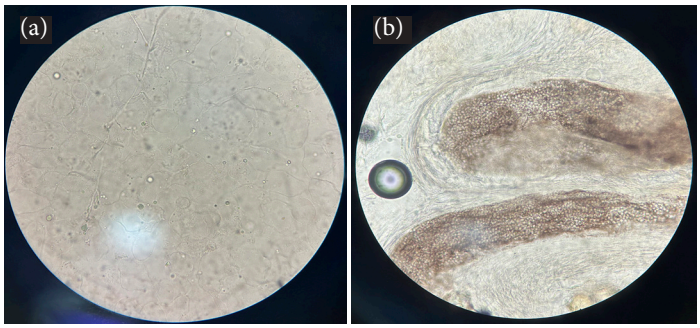

Figure 3: (a) Direct microscopy of the nail sample using a 40% potassium hydroxide (KOH) mount showing numerous thin, septate hyphae (x100); (b) Microscopy of 10% KOH mount of plucked hair showing fungal spores within the hair shaft (x400).

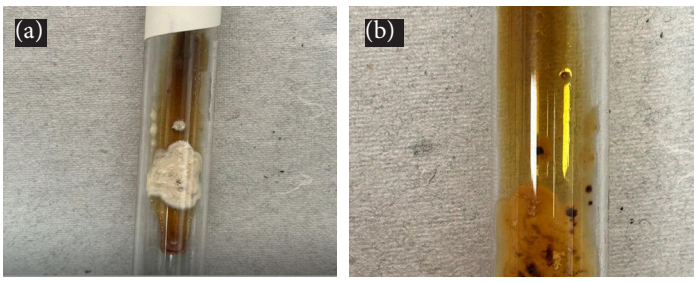

Figure 4: Colony morphology on Sabouraud dextrose agar supplemented with chloramphenicol and cycloheximide, showing (a) White to cream-colored, cottony to velvety surface colonies; (b) Characteristic deep red to wine-colored pigment on the reverse side after 7–14 days of incubation at 25–30°C.

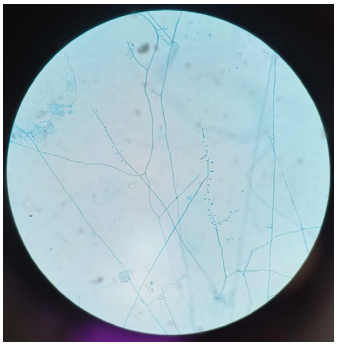

Figure 5: Lactophenol cotton blue (LPCB) mount from culture showing slender, septate hyphae with numerous teardrop- or club-shaped microconidia borne singly along the sides of the hyphae. Sparse, smooth-walled, pencil-shaped, multiseptate macroconidia are also observed (x400).

Figure 6: Marked clinical improvement with complete resolution of both scalp and nail lesions after three months of oral griseofulvin therapy.

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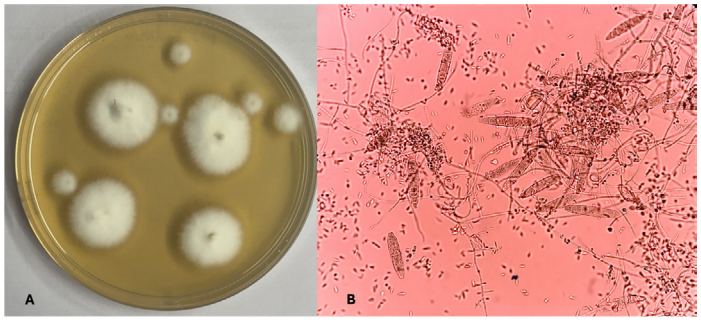
Answer for the last issue's identify the fungus (ISMM December 2024 Quiz)

Q. A 32-year-old female presented with two scaly lesions. She had a history of working on her private farm. Skin inspection revealed large, well-defined erythematous, raised and scaly plaques (around 5 and 3 cm in diameter) on the left forearm and left buttock, respectively. The plaques had borders studded with papules and pustules. The skin was scraped from the advancing border of lesions by a sterile scalpel blade. The scrapings were subjected to microbiological evaluation which included 10% potassium hydroxide (KOH) smear and culture on Sabouraud dextrose agar (SDA). KOH mount showed thin septate hyphae. SDA culture at 25°C on day 10 showed a creamy white powdery colony raised at center. (Figure A) The reverse of the colony was yellowish-brown.

The lactophenol cotton blue (LPCB) mount from culture showed thin hyphae along with abundant, fusoid-shaped and rough-walled macroconidia having 3–7 septae. Ovoid to club-shaped microconidia were scattered along the hyphae. Occasionally, spiral hyphae were also noted (Fig B).

Correct identification: ***Microsporum fulvum***

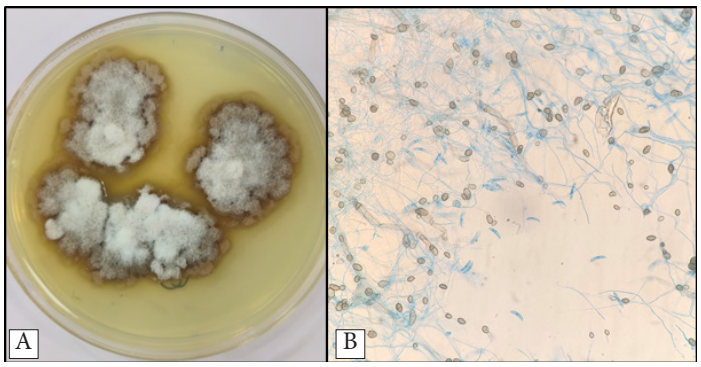
Last quiz lactophenol cotton blue mount picture.



(Correct answer was not received for this quiz)

Quiz: Can you identify the fungus?

Q, A 35-year-old male, farmer by occupation, presented with complaints of pain, redness, and gradual vision loss in his left eye. He gave history of trauma to left eye with a wooden stick, while working in his field. Slit lamp examination (SLE) showed a central corneal defect, with serrated edges. Corneal scraping showed septate hyphae in potassium hydroxide (KOH) mount. Culture on Sabouraud dextrose agar (SDA) showed growth of white fluffy colonies within 48 hours of incubation, which later developed into a greyish black colour with dark brown on the reverse. (Figure A) The lactophenol cotton blue (LCB) image from culture is shown in figure B. Identify the fungus to species level.



Send your answer to Dr. Harsimran Kaur at drharsimranpgi@gmail.com

Results of ISMM Mycology External Quality Assurance Program

Issue 29-June 2025

Results of ISMM Mycology External Quality Assurance Program conducted at PGIMER, Chandigarh

Performance Report of the Participants (32nd Batch, Jan 2025)

Total number of participating laboratories -195

S No.	Sample/ Code	Clinical details			Correct identification	Interpretation	Laboratory (%) given correct results
		Age/Sex	Clinical features/ Diagnosis	Source of specimen			
1	EQMM-1	45/M	Brain abscess	Pus from brain abscess	*Aspergillus nidulans*	Fungal Brain abscess	78.5%
2	EQMM-2	594/M	Diabetes mellitus, orbital cellulitis	Orbital biopsy	*Syncephalastrum racemosum*	Rhino-orbital Mucormycosis	68.2%
3	EQMM-3	35/M	Trauma to right eye followed by decreased vision	Corneal scraping	*Exserohilum rostratum*	Fungal keratitis	72.8%
4	EQMM-4	20/M	Itchy scaly lesion on forearm	Skin scraping	*Microsporum gypseum (Nannizzia gypsea)*	Dermatophytosis or Tinea corporis	83.4%
5	EQMM-5*	40/M	Sepsis	Blood	*Candida parapsilosis*	Candidemia	95.1%

(*- AFST required)

Results of antifungal susceptibility testing performed for EQMM -5; Laboratories participating in AFST: 83.3 %

(EQMM-5) Minimum inhibitory concentration	Amphotericin B 0.5mg/L	Fluconazole 0.25mg/L	Voriconazole 0.03mg/L	Itraconazole 0.06mg/L	Posaconazole 0.06mg/L	Anidulafungin 4mg/L	Micafungin 0.25mg/L
Participant results %	96.5%	100%	97.4%	81.9%	81.2%	81.2%	94%

Abstracts (January – June 2025)

Compiled by Dr. Joveeta Joseph

Head, Jhaveri Microbiology Centre, L V Prasad Eye Institute, Hyderabad

1. **Imidazolidine-Based Aspartate Inhibitors for *Candida* Infections**

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Drug Dev Res. 2025 Apr;86(2):e70074. doi: 10.1002/ddr.70074.

Abstract

The fungal infection gradually poses a life threat to mankind, candidiasis caused by *Candida* sp. is one among them. We describe the aspartate protease inhibition potentials of 12 sulfonyl-containing imidazolidines (5a-l) anti-candidal agents. *Candida albicans* secretes aspartic proteases (Saps), one of its most important virulent agents. These hydrolytic enzymes are critical for both fungal physiological processes and host-fungus interactions. Compounds 5a-l were examined for their fungal aspartate protease inhibition apart from their anti-candida activity. These findings were equipped and validated *in silico* using molecular docking and in vitro enzyme inhibition assays. The study found that imidazolidine derivatives inhibited aspartic protease and exhibited anti-candida action. Conclusively, imidazolidines 5g, 5h, and 5j were perceived as the most potent anti-candida compounds and are presently being evaluated for their preclinical studies.

PMID: 40159997

2. **Mortality in chronic pulmonary aspergillosis: a systematic review and individual patient data meta-analysis**

Abhinav Sengupta[1], Animesh Ray[2], Ashish Datt Upadhyay[3], Koichi Izumikawa[4], Masato Tashiro[4], Yuya Kimura[5], Felix Bongomin[6], Xin Su[7], Thomas Maitre[8], Jacques Cadranel[8], Vitor Falcao de Oliveira[9], Nousheen Iqbal[10], Muhammad Irfan[11], Yurdagül Uzunhan[12], Juan Aguilar-Company[13], Oxana Munteanu[14], Justin Beardsley[15], Koji Furuuchi[16], Takahiro Takazono[4], Akihiro Ito[17], Chris Kosmidis[18], David W Denning[19]

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Lancet Infect Dis .2025 Mar;25(3): 312-324.doi: 10.1016/S1473-3099(24)00567-X.

Abstract

Background: Despite antifungal treatment, chronic pulmonary aspergillosis (CPA) is associated with substantial morbidity and mortality. We conducted a systematic review and meta-analysis to evaluate rates of mortality and its predictors in CPA.

Methods: A systematic literature search was conducted across MEDLINE (PubMed), Scopus, Embase, and Web of Science to identify studies in English, reporting mortality in CPA, from database inception to Aug 15, 2023. We included clinical studies, observational studies, controlled trials, and abstracts. Case reports, animal studies, letters, news, and literature reviews were excluded. Authors of studies published since 2016 were also contacted to obtain anonymised individual patient data (IPD); for other studies, summary estimates

were extracted. Subgroup analysis was done for differences in overall 1-year and 5-year mortality, data source, study design, risk of bias, country, Human Development Index, age groups, and the underlying lung disease. We used random-effects meta-analyses to estimate pooled mortality rates. Subgroup analyses and meta-regression were done to explore sources of heterogeneity. One-stage meta-analysis with a stratified Cox proportional hazards model was used to estimate the univariable and hazards for mortality, adjusting for age, sex, type of CPA, treatment, and underlying pulmonary comorbidities. This study was registered with PROSPERO (CRD42023453447).

Findings: We included 79 studies involving 8778 patients in the overall pooled analysis and 15 studies involving 1859 patients in the IPD meta-analysis. Pooled mortality (from 70 studies) was estimated at 27% overall (95% CI 22-32; I^2 =%15 ,(%4·95 at 1 year (19-11; I^2 =%6·91), and %32 at 5 years (39-25; I^2 =%3·94). Overall mortality in patients with CPA with pulmonary tuberculosis as the predominant predisposing condition was 35-16) %25; I^2 =20 ;%5·87 studies) and with chronic obstructive pulmonary disease was %35 49-22); I^2 =14 ;%7·89 studies). Mortality in cohorts of patients who underwent surgical resection was low at 4-2) %3). In the multivariable analysis, among predisposing respiratory conditions, pulmonary tuberculosis history had the lowest mortality hazard (relative to an absence of the disease at baseline), whereas worse outcomes were seen with underlying malignancy; subacute invasive pulmonary aspergillosis and chronic cavitary pulmonary aspergillosis subtypes of CPA were also significantly associated with increased mortality relative to simple aspergilloma on multivariable analysis. Mortality hazard increased by %25 with each decade of age (adjusted hazard ratio %95] 25·1 CI 36·1-14·1], p<0001·0).

Interpretation: CPA is associated with substantial mortality. Advancing age, CPA subtype, and underlying comorbidities are important predictors of mortality. Future studies should focus on identifying appropriate treatment strategies tailored to different risk groups.

PMID: 39617023

3. **Computational prediction of Homo sapiens-*Candida albicans* protein-protein interactions reveal key virulence factors using dual RNA-Seq data analysis**

Ekjot Kaur[1 2], Vishal Acharya[3 4]

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Arch Microbiol. 2025 Apr 6;207(5):115. doi: 10.1007/s00203-025-04312-4.

Abstract

A prevalent pathobiont, *Candida albicans*, accounts for approximately 70% of fungal infections worldwide owing to its virulence traits that culminate in devastating fatalities within healthcare facilities. Protein-protein interactions (PPIs) between *Homo sapiens* and *C. albicans* play a pivotal role in infection and disease progression. Additionally, scarcity of information on *H. sapiens-C. albicans* protein-protein interactions makes it difficult to understand the molecular mechanisms underlying infection and host immune responses. Investigating these PPIs can provide crucial insights into host-pathogen relationships and facilitate the development of novel therapeutic interventions. To address this challenge, we utilized computational techniques based on homology and domain to project 56,515 human-fungal pathogen protein-protein interactions (HF-PPIs) involving 6830 human and 486 C. albicans proteins. We have identified 16 key virulence factors of C. albicans, including SOD1, ERG10, GFA1, and VPS4, as potential therapeutic targets. As evidenced by dual RNA-Seq data acquired at various stages of infection such as 15, 30, 60, 120, and 240 min, these fungal genes interact with down-regulated human immunomodulatory genes specifically, ADRM1, DAXX, RYBP, SGTA, and SRGN. In addition to their intrinsically disordered regions, these human genes are particularly susceptible to fungal manipulation. Through the identification of experimentally validated virulence factors and their interaction partners, this investigation constructs HF-PPI between H. sapiens and C. albicans. Our knowledge of human-fungal pathogen protein-protein interactions will be improved by integrating computational and experimental data in order to facilitate the development of efficient fungal infection prevention and treatment protocols.

PMID: 40188396

4. **Impact of an institutional antifungal stewardship program on antifungal usage and outcomes in patients with invasive fungal infections**

Janya Sachdev[1], Sudesh Gourav[1], Immaculata Xess[1], Manish Soneja[2], Sryla Punjadath[2], Vijaydeep Siddharth[3], Mragnayani Pandey[1], Sonakshi Gupta[1], Aish Manhas[1], Bhaskar Rana[1], Kavi Priya Appasami[1], Gagandeep Singh[1]

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Med Mycol. 2025 Jan 25;63(2):myaf003.doi: 10.1093/mmy/myaf003

Abstract

Therapeutic and prophylactic use of antifungals is rising continuously. However, inadequate awareness of diagnostic and treatment guidelines and limited laboratory modalities lead to inappropriate use. This study assessed the impact of an institutional antifungal stewardship program on antifungal use practices and patient outcomes. In the pre-intervention phase, data was collected regarding antifungal therapy among patients with invasive fungal infections. Appropriateness of antifungal prescription was assessed. In the intervention phase, simple algorithms for diagnosis and management of fungal infections were prepared from international guidelines and incorporated into a booklet for distribution. Monthly training sessions were conducted. New serological and molecular tests and therapeutic drug monitoring were introduced. In the post-intervention phase, an antifungal stewardship team was constituted for clinical advisory on demand and ongoing training. Data regarding antifungal therapy was collected and compared with pre-intervention data. Untreated patients decreased from 25% to 18.9% post-intervention (P = .28). Appropriate antifungal use increased from 72.6% to 77.9% (P = .4) among patients with a single fungal infection, and from 57.1% to 88.5% (P = .04) for at least one infection among those with dual fungal infections. 49 incidents of inappropriate use in various categories were seen among 75 patients receiving antifungals pre-intervention, decreasing to 42 incidents among 94 patients post-intervention (P = .06), particularly evident among patients with dual infections (P = .002). Mortality increased from 51% to 75.86% post-intervention (P = .0001). Overall, the small improvement noticed in antifungal usage pattern can still be considered significant, given the limited study period.

PMID: 39848910

5. **Quality by design driven development of lipid nanoparticles for cutaneous targeting: a preliminary approach**

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Drug Deliv Transl Res. 2025 Apr;1410-1393:(4)15. doi: 10.1007/s9-01685-024-13346.

Abstract

Fungal infections are the fourth common cause of infection affecting around 50 million populations across the globe. Dermatophytes contribute to the majority of superficial fungal infections. Clotrimazole (CTZ), an imidazole derivative is widely preferred for the treatment of topical fungal infections. Conventional topical formulations enable effective penetration of CTZ into the stratum corneum, however, its low solubility results in poor dermal bioavailability, and variable drug levels limit the efficacy. The aim was to increase dermal bioavailability and sustain drug release, thereby potentially enhancing drug retention and reducing its side effects. This work evaluated the CTZ loaded solid lipid nanoparticles (SLN) consisting of precirol and polysorbate-80 developed using high pressure homogenization and optimized with QbD approach. Prior to release studies, CTZ-SLNs were characterized by different analytical techniques. The laser diffractometry and field emission scanning electron microscopy indicated that SLNs were spherical in shape with mean diameter of 450 ± 3.45 nm. DSC and XRD results revealed that the drug remained molecularly dispersed in the lipid matrix. The CTZ-SLNs showed no physicochemical instability during 6 months of storage at different temperatures. Further, the Carbopol with its pseudoplastic behavior showed a crucial role in forming homogenous and stable network for imbibing the CTZ-SLN dispersion for effective retention in skin. As examined, in-vitro drug release was sustained up to 24 h while ex-vivo skin retention and drug permeation studies showed the highest accumulation and lowest permeation with nanogel in comparison to pure drug and Candid® cream. Further, the in-vivo antifungal efficacy of nanogel suggested once-a-day application for 10 days, supported by histopathological analysis for complete eradication infection. In summary, the findings suggest, that nanogel-loaded with CTZ-SLNs has great potential for the management of fungal infections caused by Candida albicans.

PMID: 39145818

6. **Vidarabine as a novel antifungal agent against *Candida albicans*: insights on mechanism of action**

Tanjila C Gavandi [1], Sargun T Basrani [1], Sayali A Chougule [1], Shivani B Patil [1], Omkar S Nille [2], Govind B Kolekar [2], Shivanand R Yankanchi [3], S Mohan Karuppayil [4], Ashwini K Jadhav [5]

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Int Microbiol. 2025 Mar;602-589:(3)28. doi: 10.1007/s-024-10123-00565z.

Abstract

Around 1.5 million mortality cases due to fungal infection are reported annually, posing a massive threat to global health. However, the effectiveness of current antifungal therapies in the treatment of invasive fungal infections is limited. Repurposing existing antifungal drugs is an advisable alternative approach for enhancing their effectiveness. This study evaluated the antifungal efficacy of the antiviral drug vidarabine against Candida albicans ATCC 90028. Antifungal susceptibility testing was performed by microbroth dilution assay and further processed to find the minimum fungicidal concentration. Investigation on probable mode of vidarabine action against C. albicans was assessed by using the ergosterol reduction assay, reactive oxygen species (ROS) accumulation, nuclear condensation, and apoptosis assay. Results revealed that C. albicans was susceptible to vidarabine action and exhibited minimum inhibitory concentration at 150 µg/ml. At a concentration of 300 µg/ml, vidarabine had fungicidal activity against C. albicans. 300 µg/ml vidarabine-treated C. albicans cells demonstrated 91% reduced ergosterol content. Annexin/FITC/PI assay showed that vidarabine (150 µg/ml) had increased late apoptotic cells up to 31%. As per the fractional inhibitory concentration index, vidarabine had synergistic activity with fluconazole and caspofungin against this fungus. The mechanism underlying fungicidal action of vidarabine was evaluated at the intracellular level, and probably because of increased nuclear condensation, enhanced ROS generation, and cell cycle arrest. In conclusion, this data is the first to report that vidarabine has potential to be used as a repurposed antifungal agent alone or in combination with standard antifungal drugs, and could be a quick and safe addition to existing therapies for treating fungal infections.

PMID: 39126447

7. **Efficacy of two novel antifungal lipopeptides, AF_4 and AF_5 of bacillomycin D family in murine models of invasive candidiasis, cryptococcosis, and aspergillosis**

Raees A Paul [# 1], Madhuri Madduri [# 2], Nisha Kashyap [1], Swetha Ramesh [2], Shivaprakash M Rudramurthy [1], Utpal Roy [2]

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[#]Contributed equally.

APMIS. 2025 Jan;133(1):e13506.doi: 10.1111/apm.13506.

Abstract

Invasive fungal diseases are an important public health concern due to an increase in the at-risk population and high mortality associated with these infections. Managing invasive fungal infections poses a significant challenge given the limited antifungal options and the emergence of resistance in key fungal pathogens. Through a comprehensive approach, we evaluated the in vitro antifungal activity and the in vivo efficacy of two novel lipopeptides, AF_4 and AF_5 in

murine models of disseminated candidiasis, cryptococcosis, and aspergillosis. Flow cytometry analysis with propidium iodide showed a dose-dependent increase in the permeability and disruption of fungal cell membranes, underscoring the membrane perturbing effects of AF_4 and AF_5. These observations were further substantiated by SEM analyses that showed yeast cell and hyphal deformation and leakage of cellular contents. Our in vivo investigations utilizing two doses (5 and 10 mg/kg bodyweight) of each lipopeptide and its comparison with standard antifungal therapies showed lipopeptides significantly improved the odds of mice survival in invasive candidiasis and cryptococcosis models, with a reduction in organ fungal burden by 2 to 3-log_{10} order. Additionally, in the disseminated aspergillosis model, treatment with 10 mg/kg of AF_4 significantly improved median survival from 4 to 10 days while achieving a notable -1log10 order reduction in organ fungal burden. Overall, our study underscores the potent and broad-spectrum antifungal activity of lipopeptides in mouse infection models, hinting at their promising therapeutic potential in invasive fungal disease.

PMID: 39722217

8. **ER-mitochondria encounter structure connections determine drug sensitivity and virulence of *Cryptococcus neoformans***

Deepika Kumari[1], Mohit Kumar[2], Naseem A Gaur[2], Lucky Duhan[1], Nadezhda Sachivkina[3], Raman Manoharlal[4], Ritu Pasrija[1]

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J Cell Sci. 2025 May 1;138(9):jcs263558. doi: 10.1242/jcs.263558.

Abstract

Cryptococcus neoformans is a common fungal pathogen, causing fatal meningoencephalitis in immunocompromised individuals. The limited availability of antifungals and increasing resistance in pathogens including *C. neoformans* emphasize the need to find new drugs. Mitochondria have long been associated with drug resistance in fungi. They are connected to the endoplasmic reticulum (ER) via a multiprotein complex, the ER-mitochondria encounter structure (ERMES), which is unique in the fungal kingdom. In this study on *C. neoformans*, the four subunits of the ERMES complex, namely, Mmm1, Mdm12, Mdm10 and Mdm34, were deleted to generate the strains Δmmm1, Δmdm12, Δmdm10 and Δmdm34, respectively. These mutants had impaired mitochondria and were sensitive to antifungals, including echinocandins, due to lower chitin content. Virulence factors, including capsule formation and melanin production, were debilitated in the mutants. The partner organelle ER was also affected by compromised ERMES contact, as the activity of several ER-synthesized enzymes involved in virulence was impacted. The in vivo studies in Caenorhabditis elegans model of cryptococcosis confirmed the reduced virulence of the mutants. These results indicate that the impairment of the ERMES complex is crucial for the virulence and pathogenesis of *C. neoformans*.

PMID: 40177859

9. **Propranolol is efficacious against *Aspergillus* and *Fusarium* corneal isolates *in vitro* and in a murine model of *Aspergillus* keratitis**

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Antimicrob Agents Chemother. 2025 Jun 4;69(6):e0166424. doi: 10.1128/aac.01664-24.

Abstract

Fungal keratitis is a severe corneal infection most commonly caused by filamentous fungi. Even with prompt treatment with current antifungals, it often results in corneal perforation and blindness. In this report, we observe that the beta-adrenergic antagonist, propranolol, displays antifungal activity against *Aspergillus* and *Fusarium* corneal isolates *in vitro* and strikingly blocks disease establishment in a murine model of *Aspergillus fumigatus* keratitis. These findings suggest that beta-blockers have potential as a novel FK treatment. **CLINICAL TRIALS**This study is registered with ClinicalTrials.gov as NCT00997035 (MUTT Trial).

PMID: 40372030

10. **Exploring quinazoline-derived copper(I) complex coated intravaginal ring against vulvovaginal candidiasis causing *Candida* species**

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Biofouling. 2025 Apr;41(4):378-393. doi: 10.1080/08927014.2025.2489479.

Abstract

Vulvovaginal candidiasis (VVC) is especially prevalent among intrauterine device (IUD) and intravaginal ring (IVR) users. *Candida albicans* is the leading causative agent of VVC followed by *Candida glabrata*. Ascribed to the increased drug resistance by *Candida* spp. to the currently available drugs, this study has focused on the novel quinazoline-derived copper(I) complexes as anti-candida agents. As a novel approach, a vaginal ring was coated with the best quinazoline-derived copper(I) complex, and biofilm disruption ability was evaluated. The coated vaginal ring eradicated %70 of preformed biofilms and also inhibited the hyphal transition of *Candida albicans* in a simulated vaginal fluid (SVF). The overall study validates the anti-biofilm and anti-virulent properties of the metal complex-coated vaginal ring using various microscopic studies.

PMID: 40265509

11. **Molecular docking and MD simulations reveal protease inhibitors block the catalytic residues in Prp8 intein**

of *Aspergillus fumigatus:* a potential target for antimycotics

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J Biomol Struct Dyn. 2025 Apr;43(7):3526-3541.doi:10.1080/07391102.2023.2298735.

Abstract

Resistance to azoles and amphotericin B especially in *Aspergillus fumigatus* is a growing concern towards the treatment of invasive fungal infection. At this critical juncture, intein splicing would be a productive, and innovative target to establish therapies against resistant strains. Intein splicing is the central event for the activation of host protein, essential for the growth and survival of various microorganisms including *A. fumigatus*. The splicing process is a four-step protease-like nucleophilic cascade. Thus, we hypothesise that protease inhibitors would successfully halt intein splicing and potentially restrict the growth of the aforementioned pathogen. Using Rosetta Fold and molecular dynamics simulations, we modelled Prp8 intein structure; resembling classic intein fold with horse shoe shaped splicing domain. To fully comprehend the active site of *Afu* Prp8 intein, C1, T62, H65, H818, N819 from intein sequences and S820, the first C-extein residue are selected. Molecular docking shows that two FDA-approved drugs, i.e. Lufotrelvir and Remdesivir triphosphate efficiently interact with Prp8 intein from the assortment of 212 protease inhibitors. MD simulation portrayed that Prp8 undergoes conformational change upon ligand binding, and inferred the molecular recognition and stability of the docked complexes. Per-residue decomposition analysis confirms the importance of F: block R802, V803, and Q807 binding pocket in intein splicing domain towards recognition of inhibitors, along with active site residues through strong hydrogen bonds and hydrophobic contacts. However, *in vitro* and *in vivo* assays are required to confirm the inhibitory action on Prp8 intein splicing; which may pave the way for the development of new antifungals for *A. fumigatus*.

PMID: 38149850

12. **Amplified fragment length polymorphism genotyping of *Trichophyton indotineae* indicates possible zoonotic transmission**

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Med Mycol. 2025 Feb 28;63(3):myaf020. doi: 10.1093/mmy/myaf020.

Abstract

The anthropophilic dermatophyte *Trichophyton interdigitale* and its counterpart *T. mentagrophytes* are phylogenetically closely related species. In India, the most common endemic dermatophyte species belongs to the *T. indotineae*. The internal transcribed spacer genotype VIII within this species complex was recently renamed as *T. indotineae* based on its rapid emergence in India and its elevated virulence and terbinafine resistance. While humans are considered a source of *T. interdigitale* infection, animals are considered a source of T. mentagrophytes. For *T. indotineae* it is not known whether infections occur anthropophilic or zoonotic, as there is very little data on its origin and transmission. Additionally, the environmental source of *T. indotineae* is unknown. In the current study, we have performed the molecular typing method amplified fragment length polymorphism on 24 *T. indotineae* isolates to determine the genetic diversity among animal and human origin isolates and compare it to related species. Additionally, we performed antifungal susceptibility testing by standard micro broth dilution methods against common antifungals. In contrast to the *T. interdigitale* which showed significant genetic variability between isolates from different cities, *T. indotineae* isolates demonstrate minimal genetic variability, also between samples from animals and humans, highlighting the possibility of zoonotic transmission of this virulent dermatophyte. Reduced susceptibility was found for terbinafine and griseofulvin.

PMID: 40036371

13. **Evaluating the causes associated with false positive Galactomannan assay in suspected cases of respiratory fungal infections**

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J Family Med Prim Care. 2025 Feb;14(2):736-742. doi: 10.4103/jfmpc.jfmpc_1496_24.

Abstract

Introduction: The circulating GM antigen is considered an important and reliable biomarker according to the European Organization for Research and Treatment of Cancer/Mycosis Study Group (EORTC/MSG) guidelines. However several possible causes of false-positive reactions have been reported, including intake of certain antibiotics, cross-reactivity with other fungi (e.g. *Histoplasma capsulatum*, *Alternaria* spp., *Candida* spp., and *Fusarium* spp. etc), food (Carba beans and fava beans) and food supplements. In this context, the occurrence of false-positive results may lead to an unjustified invasive investigation and anti-fungal therapy.

Purpose: The study was conducted to analyse causal association of false positive galactomannan factors.

Material and methods: BAL samples from suspected respiratory tract infections were submitted for direct microscopic examination, GM detection and fungal culture.

Results: Out of a total of 530 patients, 70 patients were in the case group (False positive GM) and 50 were in the control group (True

positive). The average GMI of the case group was 2(1-4.2). and control group was 1.8(1-3.5). At a cut-off index of >1 false positive galactomannan results were observed maximum in patients who received Amoxiclav(48.5%), Piperacillin-tazobactam(33.3%), Amoxicillin(12.5%) followed by Meropenem(8.3%). The results showed a significant association(p-value <0.001) with false positive GM.. Other fungal agent colonization also had a higher GM index in the BAL sample but it is difficult to comment on association as the odds ratio was low (0.187). The odds were also lower (0.167) in dietary history to get false positive results and similarly with those on dietary supplements, but in contrast to these findings it was seen that the odd ratio was higher in patients suffering from tuberculosis(3.777) which can be attributed to increased colonization of aspergillus in TB patients.

Conclusions: Galactomannan is the key biomarker of whether to start antifungal therapy for patients with IA and a higher mortality risk. Test results should be critically interpreted in the clinical context concerning potential causes of false-positive findings, especially with concomitant Piperacillin-tazobactam and amoxiclav use, other fungal infections and dietary history to prevent unnecessary antimycotic treatment.

PMID: 40115588

14. **Detection of *Candida* Species in Genitourinary Tract among Immunocompromised Patients Attending Rural Teaching Hospital**

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Ann Afr Med. 2025 Jun 11. doi: 10.4103/aam.aam_88_25.

Abstract

Background: Opportunistic mycosis such as candidiasis are those fungal infections that are found in patients with underlying predisposing conditions such as old age, immunosuppressive therapy, HIV, tuberculosis, and pregnancy. Urinary tract infection (UTI) is a major source of morbidity in women of all ages, older men and infant boys caused by bacterial as well as fungal agents. Fungal infections, especially *Candida* species are found to cause candidiasis in pregnant women causing various complications such as urethritis, pelvic inflammatory disease, infertility, ectopic pregnancy, and chronic pelvic pain.

Materials and methods: The samples of genitourinary tract such as urine, high vaginal swabs, vaginal discharge, and catheter tips were examined for isolation and identification of *Candida* species.

Results: A total of 498 samples were processed, of which 55 *Candida* species were obtained from urine, HVSs, vaginal discharge, and catheter tips. The most prevalent species were *Candida albicans* (63.64%), followed by *Candida tropicalis* (12.73%) and *Candida glabrata* (10.90%). The most effective drug against all the *Candida* species isolates was Caspofungin showing 100% sensitivity.

Conclusions: Maximum number of *Candida* species was obtained from the urine samples among pregnant female patients aged between 21 and 40 years with *C. albicans* being the most predominant fungus causing opportunistic fungal infections. Caspofungin was the most effective drug in these isolates. The study emphasizes the need for species-specific therapy and routine screening, especially in pregnant women.

PMID: 40495417

15. **A masked study to differentiate *in vivo* confocal microscopic features of *Pythium insidiosum* and fungal filaments**

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Ocul Surf. 2025 Jul:37:99-104.doi: 10.1016/j.jtos.2025.03.001.

Abstract

Purpose: To describe in vivo confocal microscopic features of Pythium insidiosum in patients with Pythium keratitis and compare with those observed in fungal keratitis.

Method: We collected in vivo confocal images of the cornea from patients with microbiologically confirmed *Pythium* and fungal keratitis, analysing five putative distinguishing features: filament width (broad or thin), granularity within the filament (present or absent), filament continuity or traceability, the presence or absence of loops, and the double track sign. Three masked observers were shown images with concealed identities and tasked with detecting *Pythium* filaments. After initial assessment and training, their detection rates were calculated and compared before and after training. We did perform imageJ (Open Source software project Fiji) analysis of all the images for objectively assessment.

Results: Sixty confocal images of Pythium (n = 32,15 patients) and fungal (n = 28,12 patients) keratitis were analysed. The continuity of filaments and the presence of loops emerged as strong predictors of *Pythium*, with adjusted odds ratios (OR) of 18.1 and 19.29, respectively, based on multivariate logistic regression and decision tree splits. Pre-training accuracy was 0.51, 0.52, and 0.56, but post-training (95 % CI) improved to 0.75 (0.62-0.85), 0.80 (0.67-0.89), and 0.86 (0.75-0.94). Correct identification rates for *Pythium* were 27, 28, and 29 (84-89 %) out of 32, and for fungus were 16, 21, and 24 (57.4-85.7 %) out of 28 images with sensitivity and specificity ranging from 70.7 to 87.5 % and 80-85 % respectively. ImageJ analysis revealed a significant difference between *Pythium* and fungal filaments in both width (9.30 ± 1.21 μ vs. 6.20 ± 0.88 μ, $p < 0.001$) and branching angle ($83.92 \pm 13.57°$ vs. $55.10 \pm 6.03°$, $p < 0.001$).

Conclusions: Based on our analysis, these features may be indicative of *Pythium* and could serve as a helpful reference for future prospective studies. However, further large scale studies and validation are needed to strengthen these observations.

PMID: 40086691

16. **Role of myeloid-derived suppressor and Th17/Treg cells in post-COVID-19 Rhino-Orbital mucormycosis cases**

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Immunopharmacol Immunotoxicol. 2025 Feb;47(1):94-100.doi: 10.1080/08923973. 2024. 2437482.

Abstract

Background: Rhino-Orbital-Cerebral Mucormycosis (ROCM) cases increased sharply in India during the second COVID19- wave. Due to uncontrolled hyperglycemia, prolonged steroid use, and high ferritin levels, the immune system was dysregulated throughout this surge.

Methods: Our study examined post-COVID19- ROCM patients› T regulatory cell (Treg), T helper 17 cell (Th17) and Myeloid derived suppressor cell (MDSC) levels before and after three months of treatment. T cell activation and MDSC profile were measured in peripheral blood from 20 post-COVID19- mucormycosis patients and 20 age-matched controls.

Results: Compared to controls, cases had significantly greater Th17 cells ($CD^+4IL\text{-}23R^+$) before and after treatment ($p < 0.05$), with no significant change between pre- and post-treatment. In pretreatment cases, Treg cells ($CD^+4CD25^+FoxP3^+$) were lower than controls, but dramatically increased ($p < 0.05$) following treatment. Further, these patients had significantly higher rates of monocytic (m) MDSCs ($CD^+14HLA\text{-}DR^{low/-}$) compared to healthy persons ($p < 0.05$). Interestingly, after three months of treatment, mMDSC levels dropped to levels similar to healthy controls. Similarly, ROCM patients had higher levels of granulocytic (g) MDSCs ($HLA\text{-}DR^{low/-}CD33^+CD11b^+CD66^+$) than healthy controls, although these levels normalized after three months. Patients had considerably greater expression levels of RORγt, TGF-β, and IL-10 mRNA before therapy compared to healthy controls. FoxP3 and Arg-1 mRNA expression was lower in pretreatment patients than in healthy people. After treatment, these individuals' IL-10, FoxP3, and Arg-1 mRNA expression increased.

Conclusion: MDSCs may play a role in mucormycosis immunological dysregulation, suggesting that restoring balance may improve patient outcomes.

PMID: 39696801

17. **Utility of Fluorescent Microscopy for Rapid Intraoperative Diagnosis of Rhinocerebral Mucormycosis: Experience from a Tertiary Care Center in Central India**

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Cureus. 2025 Mar 31;17(3):e81537.doi: 10.7759/cureus.81537.

Abstract

Rhino-orbital-cerebral mucormycosis is an uncommon life-threatening infection caused by the angioinvasive fungus *Mucorales* and is associated with high morbidity and mortality. In India, the pandemic of COVID19- was associated with another deadly disease, rhinocerebral mucormycosis, which further complicated the course of the disease, necessitating an accurate and rapid diagnosis. Conventional methods of diagnosis, like fungal culture, histopathology, Gomori methenamine silver (GMS), and periodic acid-Schiff (PAS) stain, are not feasible for intraoperative diagnosis. We studied the use of fluorescent brightener calcofluor white (CFW) for rapid intraoperative diagnosis of mucormycosis and compared it with intraoperative crush smear cytology and frozen section. A total of 37 intraoperative samples were studied, of which 11 were positive for the fungus. Calcofluor white detected fungus in seven samples, while frozen section detected fungus in eight samples. Calcofluor white stain showed less sensitivity than the frozen section but had high specificity. In the presence of marked necrosis, suspicious fragments on frozen sections could be quickly confirmed by fluorescent stain. Thus, CFW direct microscopy is a useful adjunct for the rapid diagnosis of mucormycosis.

PMID: 40314049

18. **A study on the effectiveness of an antifungal stewardship program in immunocompromised patients in a tertiary-care teaching hospital: The antifungal stewardship (TAFS) study**

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Indian J Med Microbiol. 2025 May-Jun:55:100865. doi: 10.1016/j.ijmmb.2025.100865

Abstract

Introduction: Anti-fungal stewardship (AFS) is a neglected aspect of antimicrobial stewardship programs. This study aimed to examine the effectiveness of an AFS program to ensure rational prescribing of antifungals via a post-prescription review and feedback method.

Methods: In this prospective, interrupted time series analysis, AFS was done on adult patients admitted to the department of hematology in a tertiary care hospital in South India. In the pre-intervention phase, patients on anti-fungal therapy for more than 48 h were identified and baseline data was collected. In the intervention phase, patients on antifungals for >48 h were assessed by an AFS team including an infectious diseases specialist and appropriate recommendations were made regarding modification or discontinuation of the antifungals where required. Acceptance of the intervention by the treating team and clinical outcomes were recorded.

Results: A total of 193 courses of antifungal therapy in 152 patients were analyzed over 6 months, of which 107 courses belonged to the pre-intervention phase and 86 were in the intervention phase. In the intervention phase, the AFS teams recommended that 15 (17.44 %) of antifungal prescriptions be modified. Among these, 66 % of the recommendations were accepted by the treating physician. Days of therapy per 1000 patient days were calculated for each individual anti-fungal drug and there was a significant reduction in consumption

of antifungals, particularly voriconazole, posaconazole and echinocandins in the intervention phase. There was no statistically significant difference in the in-hospital mortality [26.16 % vs 23. 25 % (p = 0.64)] between the two groups.

Conclusion: In this study, a focused post prescription review and feedback in an antifungal stewardship program appeared to significantly decrease the prescription of antifungal medication without adversely affecting patient outcomes.

PMID: 40294871

19. **Stability enhancement of Amphotericin B using 3D printed biomimetic polymeric corneal patch to treat fungal infections**

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Int J Pharm. 2025 Feb 10:670:125149.doi: 10.1016/j.ijpharm.2024.125149.

Abstract

Amphotericin B eye drops (reconstituted from lyophilized Amphotericin B formulation indicated for intravenous use) is used off-label for fungal keratitis. However, the reconstituted formulation is stable only for a week, even after refrigeration. Moreover, a high dosing frequency makes it an inconvenient treatment practice. The current study aims to develop a stable Amphotericin B-loaded biomimetic polymeric corneal patch (Ampat) using 3D printing. Hydroxypropyl methylcellulose and chitosan were used to formulate Ampat, which was then characterized for its physical and mechanical properties. The stability studies were performed at different conditions, protected from light. Further, the therapeutic efficacy of Ampat was evaluated against *Candida albicans*-induced fungal keratitis using *ex vivo* and *in vivo* efficacy models. Amphotericin B in Ampat was found to be stable at room temperature (25 °C) and refrigerated conditions for at least two months. Computer simulations showed that the hydrolysis was a major degradation mechanism of Amphotericin B and was reduced when loaded in the polymeric corneal patch. The *ex vivo* and *in vivo* studies show that Ampat was as efficacious as the marketed Amphotericin B formulation but with a reduced administration frequency (1 vs 12 times per day). The present study demonstrated Ampat as a potential alternative to reconstituted lipid-bound eye drops to treat fungal keratitis.

PMID: 39736279

20. **Clinical Evaluation of a Novel CRISPR-Cas12a-Based RID-MyC Assay for the Diagnosis of Fungal Endophthalmitis**

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Ophthalmol Retina. 2025 May;452-444:(5)9.doi: 10.1016/j.oret.2024.11.003.

Abstract

Objective: This study evaluated the RID-MyC (Rapid Identification of Mycoses using clustered regularly interspaced short palindromic repeats [CRISPR]) assay, a CRISPR/Cas12a-based diagnostic tool, for its efficacy in diagnosing fungal endophthalmitis (FE) compared with panfungal polymerase chain reaction (PCR) and culture methods.

Design: A comparative cross-sectional study assessing the performance of the RID-MyC assay against established diagnostic modalities for FE.

Subjects: The study included 133 intraocular samples from 117 patients with suspected microbial endophthalmitis.

Methods: The study compared the sensitivity, specificity, positive predictive value, and negative predictive value of the RID-MyC assay against panfungal PCR and culture. The limit of detection for Aspergillus flavus and Candida albicans was determined for both RID-MyC and panfungal PCR across 3 different media: nuclease-free water, aqueous humor, and vitreous humor. Discrepancy analysis was conducted for discordant results, incorporating clinical outcomes and responses to antifungal treatment.

Main outcome measures: The study primarily assessed the sensitivity, specificity, positive predictive value, and negative predictive value for clinical samples. Time to diagnosis was also evaluated.

Results: The RID-MyC assay demonstrated a sensitivity of 88.24% (95% confidence interval [CI], 63.56%-98.54%) and specificity of 93.1% (95% CI, 86.86%-96.98%), with positive predictive value and negative predictive value of 65.22% (95% CI, 48.45%-78.91%) and 98.18% (95% CI, 93.62%-99.50%), respectively. Discrepancy analysis enhanced sensitivity to 90.48% (95% CI, 69.62%-98.83%) and specificity to 96.43% (95% CI, 91.11%-99.02%). The RID-MyC assay was 10- to 1000-fold more sensitive than panfungal PCR in detecting A. flavus and C. albicans in intraocular specimens. The time to diagnosis with the RID-MyC assay was consistently <2 hours.

Conclusions: The RID-MyC assay may advance the rapid and precise diagnosis of FE, with possible relevance to other invasive fungal conditions.

PMID: 39522754

21. **Evaluation of biofilm formation and antimicrobial susceptibility (drug resistance) of *Candida albicans* isolates**

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Braz J Microbiol. 2025 Mar;364-353:(1)56.doi: 10.1007/s-024-42770-01558w.

Abstract

Candida albicans comprises over 80% of isolates from all forms of human candidiasis. Biofilm formation enhances their capacity to withstand therapeutic treatments. In addition to providing protection, biofilm formation by *C. albicans* enhances its pathogenicity. Understanding the fundamental mechanisms underlying biofilm formation is crucial to advance our understanding and treatment of invasive *Candida* infections. An initial screening of 57 *Candida* spp. isolates using CHROMagar Candida (CHROMagar) media revealed that 46 were *C. albicans*. Of these, 12 isolates (33.3%) had the capacity to form biofilms. These 12 isolates were subjected to multiple biochemical and physiological tests, as well as 18 S rRNA sequencing, to confirm the presence of *C. albicans*. Upon analysis of their sensitivity to conventional antifungal agents, the isolates showed varying resistance to terbinafine (91.6%), voriconazole (50%), and fluconazole (42%). Among these, only CD50 showed resistance to all antifungal agents. Isolate CD50 also showed the presence of major biofilm-specific genes such as ALS3, EFG1, and BCR1, as confirmed by PCR. Exposure of CD50 to gentamicin-miconazole, a commonly prescribed drug combination to treat skin infections, resulted in elevated levels of gene expression, with ALS3 showing the highest fold increase. These observations highlight the necessity of understanding the proteins involved in biofilm formation and designing ligands with potential antifungal efficacy.

PMID: 39500825

22. **Studying Human Pathogenic *Cryptococcus gattii* Lineages by Utilizing Simple Sequence Repeats to Create Diagnostic Markers and Analyzing Diversity**

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Biochem Genet. 2025 Jun;2392-2373:(3)63.doi: 10.1007/s-024-10528 7-10812.

Abstract

In this study, we compared the occurrence, relative abundance (RA), and density (RD) of simple sequence repeats (SSRs) among the lineages of human pathogenic *Cryptococcus gattii* using an in-silico approach to gain a deeper understanding of the structure and evolution of their genomes. *C. gattii* isolate MF34 showed the highest RA and RD of SSRs in both the genomic and transcriptomic sequences, followed by isolate WM276. In both the genomic (50%) and transcriptomic (65%) sequences, trinucleotide SSRs were the most common SSR class. A motif conservation study found that the isolates had stronger conservation (56.1%) of motifs, with isolate IND107 having the most (5.7%) unique motifs. We discovered the presence of SSRs in genes that are directly or indirectly associated with disease using gene enrichment analysis. Isolate-specific unique motifs identified in this study could be utilized as molecular probes for isolate identification. To improve genetic resources among *C. gattii* isolates, 6499 primers were developed. These genomic resources developed in this study could help with diversity analysis and the development of isolate-specific markers.

PMID: 38773043

23. **An integrated bioinformatics and machine learning-based approach to depict key immunological players associated with candidemia during immunodeficiency**

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Comput Biol Chem. 2025 May 15:119:108505. doi: 10.1016/j.compbiolchem.2025.108505.

Abstract

It is evident that a robust immune system keeps *Candida albicans* infection in check, but weakened immunity opens the door for shifting from a benign yeast form to an invasive hyphal form which leads to systemic candidiasis with high mortality rate. However, the crucial players contributing to the increased susceptibility of immune-deficient individuals to Candida infection remain obscure. To uncover the molecular differences between these conditions, blood-associated proteins from the NDEx database and differentially expressed genes from GEO datasets of immunocompetent and immune-deficient individuals infected with C. albicans were analysed. We focused on deregulated proteins exhibiting inverse expression patterns i.e. upregulated in one group and downregulated in the other and identified 539 proteins. Mapping them onto protein-protein interaction network reconstructed with blood- associated proteins, revealed that they exhibit in 45 hubs, 31 network nodes forming 29 intermodular complexes, and 69 clustered into 11 immunologically relevant MCODE modules. Amongst them 13 key host molecules emerging as key player based on their network topological properties. Furthermore, a machine learning model was developed with a precision of 85 %, recall of 92 %, F1-score of 89 %,

and accuracy of 81 % which substantiates the robust association of 11 out of 13 proteins with fungal co-infections in immune-deficient individuals. These findings underscore key host proteins maintaining immune balance in healthy individuals while their disruption in immune-deficient conditions may weaken defense mechanisms and promote fungal infections. Identification of crucial proteins promoting T-reg cells proliferation and M2 macrophage polarization in immune-deficient conditions offers promising therapeutic targets following experimental validation.

PMID: 40403354

24. **Keratomycosis: An insight into epidemiology, etiology, and antifungal susceptibility testing of causative agents at a tertiary care centre**

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Med Mycol. 2025 Apr 4)63;2):myaf038.doi: 10.1093/mmy/myaf038.

Abstract

In India, mycotic keratitis accounts for 7%-63% of infectious keratitis. Ocular trauma being the primary predisposing factor for mycotic keratitis. The present prospective, observational study was conducted on the corneal scrapings from clinically suspected patients of keratomycosis. Samples were processed as per the standard mycological techniques. Antifungal susceptibility testing was performed as per CLSI guidelines M38A2 and M27A3 for mycelial fungi and yeast, respectively. Out of a total of 254 patients suspected to be suffering from mycotic keratitis based on clinical presentation, 68 (26.77%) were positive for fungal aetiology. Male preponderance was observed with male-to-female ratio of 2.78:1. Patients in age group 51-60 years were maximally affected. The majority of the isolates of patients having fungal keratitis were that of *Aspergillus* sp. (31, 45.6%), followed by *Fusarium* sp. (12, 17.6%), *Curvularia lunata* (5, 7.4%), *Candida* sp. (4, 5.9%), *Alternaria* sp. (2, 2.9%), *Rhodotorula* sp. (1, 1.5%), and *Acremonium* sp. (1, 1.5%). Some rare isolates were *Colletotrichum* sp. (1), *Botryosphaeria dothidea* (2), *Lasiodiplodia pseudotheobromae* (1), and *Acrophialophora fusispora* (1). Overall, MIC values for natamycin and amphotericin B were high in *Aspergillus* sp., while *Fusarium* sp. had high MIC for voriconazole and itraconazole. *Candida* sp., *Curvularia* and *Alternaria* sp. had high MIC values for fluconazole. As mycotic keratitis is an infective condition involving healthy eyes, leading to morbid eye conditions and even blindness, strong clinical suspicion of fungal keratitis followed by timely diagnosis and antifungal susceptibility testing-based treatment may help the clinicians in better management and improvement of the outcome of patients.

PMID: 40221134

25. **Comparative Efficacy of Three Oral Itraconazole Formulations in Superficial Dermatophytosis**

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Mycoses. 2025 Jun;6)68):e70080. doi: 10.1111/myc.70080.

Abstract

Introduction: Dermatophytosis is a chronic public health issue in India, often requiring systemic antifungals. Itraconazole (ITZ) is commonly used, but conventional forms show variable absorption. Super-bioavailable itraconazole (SUBA-ITZ) offers improved pharmacokinetics, though clinical comparisons are limited.

Objective: To compare the efficacy, safety, relapse, and recurrence rates of three oral ITZ formulations-Conventional ITZ 100 mg (C-ITZ), SUBA-ITZ 65 mg, and SUBA-ITZ 50 mg-in superficial dermatophytosis.

Methods: In this open-label, randomised study at a tertiary hospital, 150 patients with confirmed tinea corporis, cruris, or faciei were equally assigned to: Group A: C-ITZ 100 mg BID Group B: SUBA-ITZ 65 mg BID Group C: SUBA-ITZ 50 mg BID Treatment lasted 6 weeks without topical antifungals. Assessments were done at 3 and 6 weeks; relapse and recurrence were monitored telephonically at 3 and 6 months.

Results: All groups showed similar clinical response at 6 weeks (BSA, PGA, KOH negativity), with no significant differences. At 3 months, Group C had significantly lower relapse and recurrence (10.2%) than Group B (31.1%, 28.9%) and Group A (23.9%, 26.1%) ($p < 0.05$). By 6 months, differences were not significant.

Conclusions: All three itraconazole formulations demonstrated comparable short-term efficacy in treating superficial dermatophytosis. These findings underscore the need for larger, long-term randomised controlled trials to optimise itraconazole dosing strategies.

PMID: 40536246

26. **A decision tree analysis to evaluate the optimal approach to screen allergic bronchopulmonary aspergillosis in asthmatic patients**

Ritesh Agarwal[1], Inderpaul Singh Sehgal[1], Puneet Saxena[2], Sahajal Dhooria[1], Valliappan Muthu[1], Kathirvel Soundappan[3], Kuruswamy Thurai Prasad[1], Mandeep Garg[4], Shivaprakash Mandya Rudramurthy[5], Ashutosh Nath Aggarwal[1], Arunaloke Chakrabarti[6]

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J Asthma. 2025 May;766-761:(5)62.doi: 02770903.2024.2439994/10.1080.

Abstract

Background: Various methods are available to screen for allergic bronchopulmonary aspergillosis (ABPA) in asthma, but their comparative performance remains uncertain.

Objectives: To identify the optimal screening algorithm for ABPA in asthmatic patients and evaluate the crude cost of various diagnostic approaches.

Methods: We performed a post hoc analysis of prospectively collected data from consecutive adult asthmatic patients evaluated for ABPA. The diagnosis was based on the revised International Society for Human and Animal Mycology ABPA Working Group criteria. Initial evaluations included measurements of serum *Aspergillus fumigatus*-IgE (≥0.35 kUA/L), serum total IgE (≥500 IU/mL), serum *A. fumigatus*-IgG (≥27 mgA/L), blood eosinophil count (BEC

≥500 cells/μL), and chest CT findings. A decision tree was manually constructed using recursive partitioning to identify the most effective diagnostic pathway.

Results: Among 543 adult asthmatics, 106 were diagnosed with ABPA. Serum *A. fumigatus*-IgE was positive in 221 (40.7%) patients, while serum total IgE was elevated (≥500 IU/mL) in 300 (55.3%) patients. The serum total IgE-based approach required 196 additional tests during screening, compared to 115 in the *A. fumigatus*-IgE method. The BEC-based strategy missed 28 cases of ABPA. Although the CT-directed protocol had the fewest false positives, it required 437 additional screening radiographic procedures and missed eight ABPA cases. The *A. fumigatus*-IgE pathway emerged as the most cost-effective, whereas imaging-based strategies were the most expensive.

Conclusions: Serum *A. fumigatus*-IgE is the optimal screening test for ABPA in asthma. It minimizes unnecessary testing while maintaining high diagnostic accuracy, making it a preferable approach in clinical practice.

PMID: 39641611

27. **Dual Drug Loaded Topical Cubosomal Gel Against *Candida albicans*: An *In Vitro* and *In Vivo* Proof of Concept**

A Gowri Nath[1], Klaudi K Vaiphei[1], Ankaj Kumar[1], Sargun Basrani[2], Ashwini Jadhav[2], Rudra Chakravarti[3], Dipanjan Ghosh[3], Kuldeep K Bansal[4 5], Arvind Gulbake[6]

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AAPS PharmSciTech. 2025 Mar 5;26(3):77. doi: 10.1208/s12249-025-03070-2.

Abstract

Dual drug approaches are gaining research interest owing to the reduction of drug resistance and additive or synergistic effects in treating fungal infections caused by Candida albicans. The present study includes the combination of ketoconazole (KTC) and eugenol (EGN) co-embedded cubosomes (KTC-EGN-CBs) for the effective treatment of candidiasis.The bio-membrane-typical framework of the cubic phase in CBs can help retain both drugs leading to enhancement of antifungal activity. KTC-EGN-CBs were developed by high-speed homogenization, followed by the probe sonication. The optimized KTC-EGN-CBs depicted lower particle size (138.8 ± 1.03 nm) and PdI (0.260 ± 0.006) with a high entrapment efficiency of KTC (79.73 ± 1.21%) and EGN (90.92 ± 2.53%). Further, KTC-EGN-CBs were loaded into the hydrogel system for ease of topical application. The ex vivo diffusion study depicted the CBs helping the KTC and EGN to exhibit significantly higher permeation and retention owing to the resemblance in cubic structure with the skin. Additionally, the in vitro antifungal study of KTC-EGN-CBs resulted in a higher zone of inhibition when compared to the plain drugs against Candida albicans. Furthermore, the effectiveness of cubosomal formulation was observed in the inhibition of planktonic growth, yeast to hyphal formation, biofilm formation, and ROS production. The antifungal activity of KTC-EGN-CBs was found to be more prominent in the infected silkworm model than the plain KTC-EGN. The cell cytotoxicity study on human keratinocyte cells and the irritation study on the hen's egg test-chorioallantoic membrane assay revealed the non-cytotoxic and non-irritant nature of the prepared cubosomes. In a nutshell, these findings demonstrated CBs as a promising carrier for KTC and EGN to effectively treat candidiasis.

PMID: 40045107

28. **A comprehensive *in vitro* and *in silico* assessment of eugenol glycoconjugates against azole and amphotericin B resistant *Rhizopus spp***

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Mol Biol Rep. 2025 Jun 12;52(1):589. doi: 10.1007/s11033-025-10673-2.

Abstract

Background: *Rhizopus* spp. is a major cause of mucormycosis, a severe infectious disease with high morbidity and mortality. Treatment is challenging due to rising antifungal resistance. Glycosylation is a crucial technique for enhancing the properties of phenolic compounds like eugenol. The present study aims to examine the antifungal efficacy of eugenol glycoconjugates against azole and amphotericin B-resistant Rhizopus isolates.

Methods and results: Out of 50 soil samples, 12 isolates belonging to Mucorales were obtained, of which 7 were identified as Rhizopus spp. via 18S ITS sequencing. Antifungal susceptibility testing (AST) revealed that all Rhizopus isolates were resistant to amphotericin B (MIC > 1 μg/mL). Most isolates also showed resistance towards posaconazole (MIC > 1 μg/mL) and itraconazole (MIC > 2 μg/mL). AST of eugenol glycoconjugate (coded 6g) showed efficacy against resistant Rhizopus isolates, with MIC values ranging from 6.25 μg/mL to 25 μg/mL. Flow cytometry confirmed its fungicidal activity, correlating with MIC data. Compound 6g significantly reduced conidial germination within 24 h and exhibited no cytotoxicity on A549 lung cancer cells. In-silico analysis revealed a negative binding affinity of compound 6g for the spore coat protein CotH3, which could be a potential antifungal target.

Conclusion: Compound 6g could be an potential antifungal molecule against resistant Rhizopus spp, which requires further studies.

PMID: 40504380

29. **Performance of LDBio *Aspergillus* ICT IgM/IgG Lateral Flow Assay in Diagnosing Chronic Pulmonary Aspergillosis in Community Versus Hospital Setting**

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Mycopathologia. 2025 Jan 9:(1)190;7. doi: 10.1007/s-024-11046 3-00917.

Abstract

Background: LDBio immunochromatographic lateral flow assay, a point-of care test, detects IgM/IgG antibodies against Aspergillus fumigatus (LDBio-ALFA). LDBio-ALFA has been evaluated for diagnosing chronic pulmonary aspergillosis (CPA) in hospital patients, though its efficacy in field settings remains unexamined.

Objective: Our primary objective was to assess the diagnostic accuracy of LDBio-ALFA in diagnosing CPA in a field and a hospital cohort. The secondary objective was to compare the diagnostic performance of LDBio-ALFA and A. fumigatus-IgG measured by a commercial automated fluorescent enzyme immunoassay (FEIA) using latent class analysis (LCA).

Methods: We prospectively enrolled adult subjects with post-tuberculosis lung abnormality (PTLA) from a tertiary care hospital (hospital cohort), and designated microscopy centers and a community health center (field cohort). We measured A. fumigatus-IgG using LDBio-ALFA and FEIA in the same serum sample.

Results: We enrolled 508 subjects, of which 122 and 386 constituted field and hospital cohorts. CPA was diagnosed in 325/508 (64%) subjects. The CPA prevalence was higher in the hospital (78% [301/386]) than in the field cohort (19.7% [24/122]). The sensitivity and specificity of LDBio-ALFA in the entire cohort in diagnosing CPA was 81.2% and 85.3%. The sensitivity of LDBio-ALFA in the field cohort was 83.3% and 81.1% in the hospital population. On LCA, the sensitivity and specificity of the FEIA method (A. fumigatus-IgG ≥ 27 mgA/L) was 100% and 86.7%, while for LDBio-ALFA it was for 84.5% and 81.3% for diagnosing CPA.

Conclusion: LDBio-ALFA is a valuable test for diagnosing CPA in the field and in hospital patients. However, a negative test should be confirmed using an automated immunoassay.

PMID: 39775199

30. **Sensitivity and Specificity of Plasma and Bronchoalveolar Lavage Fluid PCR for Diagnosing Pulmonary Mucormycosis in Subjects With Diabetes Mellitus**

Rana Sadaqat Nawaz[1], Ritesh Agarwal[2], Shivaprakash M Rudramurthy[3], Hansraj Choudhary[4], Ritika Harchand[3], Karthick Kumar[3], Inderpaul Singh Sehgal[2], Harsimran Kaur[3], Sahajal Dhooria[2], Kuruswamy Thurai Prasad[2], Nidhi Prabhakar[5], Ashutosh N Aggarwal[2], Valliappan Muthu[2]

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Mycoses. 2025 Apr;4)68):e70063.doi: 10.1111/myc.70063.

Abstract

Background: Mucorales polymerase chain reaction (PCR) is used to diagnose pulmonary mucormycosis (PM) among neutropenic individuals. However, data on the utility of PCR in patients with diabetes mellitus, another major risk factor for PM, are limited.

Objective: The primary objective was to assess the diagnostic performance of a commercial real-time PCR assay (MucorGenius) in plasma and bronchoalveolar lavage fluid (BALF) for diagnosing PM (proven and probable cases only) in patients with suspected invasive mould disease (IMD). For the secondary objective, we evaluated the performance of the MucorGenius assay in all PM (proven, probable, and possible) cases.

Methods: We prospectively enrolled patients with suspected IMD and assessed the performance of MucorGenius PCR (index test) in plasma and BALF samples. A multidisciplinary team assigned the final diagnosis of IMD (reference standard) based on microscopy, histopathology, cytology, and culture. We report the sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) with 95% confidence intervals (CI).

Results: We enrolled 103 patients, of whom 43 (41.7%) were confirmed to have PM. Plasma PCR showed a sensitivity of 18.6% (95% CI: 8.4-33.4), specificity of 90.7% (95% CI:77.9-97.4), PPV of 66.7%, and NPV of 52.7%. Including possible PM/IMD cases improved the plasma PCR sensitivity to 30.0% (95% CI: 18.9-43.2) and retained specificity at 90.7%. BALF PCR had better sensitivity (47.4%) but poorer specificity (69.6%), with a PPV of 56.3% and NPV of 61.5%.

Conclusion: Plasma and BALF MucorGenius PCR have poor diagnostic performance for diagnosing PM among individuals with diabetes mellitus. Further multicenter studies are needed to validate these findings.

PMID: 40257000

31. **The Gcn5 lysine acetyltransferase mediates cell wall remodeling, antifungal drug resistance, and virulence of *Candida auris***

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mSphere. 2025 Apr 4)10;29):e0006925. doi: 10.1128/ msphere.25-00069. Epub 2025 Mar 11.

Abstract

Candida auris has emerged as a multidrug-resistant human fungal pathogen that causes infections of high morbidity and mortality. However, the molecular mechanisms underlying pronounced multidrug resistance and host-pathogen interactions are poorly understood. Here, we show that *C. auris GCN5* lysine acetyltransferase is essential for cell wall remodeling, antifungal drug resistance, and virulence. The *Candida albicans GCN5* has previously been shown to be an important regulator of antifungal drug resistance and virulence. Therefore, to identify Gcn-5dependent evolutionary conserved as well as divergent transcriptional networks between the two species, we performed comparative transcriptional analysis. The gene set enrichment analysis of *C. auris* vs *C. albicans*

*gcn5*Δ transcriptomic data revealed several major biological pathways and processes including sphingolipid metabolism and glycosylphosphatidylinositol anchor biosynthesis to be enriched in both species. Consistent with these data, we found a prominent role for *C. auris* Gcn5 in maintaining cell-wall architecture, as the *C. auris gcn5*Δ mutant demonstrated a significant increase in cell-surface β-glucan exposure and chitin content. Additionally, we observed that Gcn5 modulates susceptibility to caspofungin and was required for fungal survival when challenged with primary murine macrophages and neutrophils *ex vivo*. Furthermore, disruption of *GCN5* causes virulence attenuation in a murine model of disseminated candidiasis. Lastly, lysine acetyltransferase inhibitor cyclopentanone, -4)-4]-2chlorophenyl)-2-thiazolyl] hydrazone displayed antifungal activity either alone or in combination with caspofungin against the drug-resistant *C. auris* wild-type strain. Collectively, these data provide new insights into the mechanisms of antifungal drug resistance and *C. auris*-host interactions and suggest Gcn5 lysine acetyltransferase as a potential target for antifungal therapy.

PMID: 40066990

Glimpse of CME on Fungal Infections

Department of Microbiology, Parul Institute of Medical Sciences and Research in association with Indian Society of Medical Mycologists (ISMM) conducted one day CME on **Mycology In Practice: From Diagnosis To Stewardship** on 10th June 2025, at PIMSR, Vadodara. The CME covered major aspects of Mycology, "Introduction to Clinical spectrum of fungal infections" by Dr. Anant Marathe, Professor, Dept of Microbiology, "Sample collection, transport & processing" by Dr. Radhika Khara, Professor, Dept of Microbiology, "Approach to Laboratory Diagnosis" by Dr. Vaidehi Mehta, Lab Director, Professor & Head, Dept of Microbiology at PIMSR. The CME was attended by 150 participants from Gujarat. Dr. Shukla Das, Secretary ISMM, Director, Professor & Head, Dept. of Microbiology, UCMS & GTBH, Delhi discussed the Identification and AFST of Yeasts and Moulds along with Antifungal Stewardship. Dr. Pratibha Kale, Joint Secretary ISMM, Additional Professor, Microbiology, ILBS, Delhi, discussed non-culture based methods of fungal diagnosis (serology, molecular, HPE). Dr Shukla Das and Dr Pratibha Kale, EC council members, conducted a hands-on workshop on the identification of yeasts and moulds.

The CME was well received by the participants and was important to create awareness about appropriate diagnosis of fungal infections.

Glimpse of CME on fungal infections

A CME on "**Comprehensive strategies for diagnosing invasive fungal infections including antifungal testing approaches**" was organised by Department of Microbiology, MGUMST, Jaipur in collaboration with IAMM-Rajasthan Chapter on 28th April 2025 at Mahatma Gandhi Medical College, Jaipur. Dr. Nitya Vyas, Professor of Microbiology was the organising President and Dr. Shaveta Kataria, Associate Professor the Organising Secretary. The CME was structured to cover a broad spectrum of topics pertinent to the diagnosis and management of IFIs.

Registration

1. The first 40 applicants will be selected as participants.
2. Priority will be given to faculty members and postgraduate students actively involved in mycology projects, as well as final-year MD students.
3. Selected participants will be notified via email.
4. Upon selection, participants must confirm their participation by completing the course fee payment within 48 hours of receiving the email.
5. Payment instructions and details will be shared in the selection email.

OFFLINE

Rs. 10,250/-

(Including GST, Tamil Nadu Medical Council (TNMC) Points, Mycology manual, snacks and lunch)
(ACCOMODATION NOT INCLUDED)

ONLINE

Rs. 3750/-

(WITH MYCOLOGY MANUAL)

Rs. 2500/-

(WITHOUT MYCOLOGY MANUAL)

https://docs.google.com/forms/d/e/1FAIpQLSexGtXFuf_TzXa5d7M_Nbf39PnHZIL-BiE3OGAaov03pl4Lwg/viewform?usp=header

CLICK HERE

REGISTERATION CLOSES ON 10TH AUGUST, 2025

mycologyworkshop@gmail.com

Dr Anupma Jyoti Kindo, Professor, 9884839196

Dr T Premamalini, Professor, 9841316068

Organising Committee

ORGANISING CHAIR PERSON
Dr M. Shanthi
Professor & Head, Dept. of Microbiology SRIHER, Chennai

ORGANISING SECRETARY
Dr T Premamalini,
Professor, Dept. of Microbiology SRIHER, Chennai

JOINT SECRETARY
Dr Anupma Jyoti Kindo,
Professor, Dept. of Microbiology SRIHER, Chennai

JOINT SECRETARY
Dr P Kennedy Kumar,
Professor, Dept. of Microbiology SRIHER, Chennai

TREASURER
Dr Sharanya Pillai,
Senior Resident Dept. of Microbiology SRIHER, Chennai

QUIZ

1 — **Rs. 1000/-**

2 — **Rs. 750/-**

3 — **Rs.500/-**

DEPARTMENT OF MICROBIOLOGY

16TH ANNUAL WORKSHOP ON BASIC AND MOLECULAR DIAGNOSTICS IN MYCOLOGY

HYBRID MODE

DATE & VENUE
22nd - 26th AUGUST 2025
MICROBIOLOGY PRACTICAL HALL, SRIHER, PORUR, CHENNAI

About the workshop

In today's rapidly evolving healthcare landscape, the need for expertise in medical mycology has never been more critical. Fungal infections have emerged as a significant global health concern, demanding skilled professionals capable of timely and accurate diagnosis.

To address this growing challenge, we are pleased to present the **16th Annual Workshop on Basic and Molecular Diagnostics in Mycology** — a comprehensive, hands-on program designed to equip participants with essential skills in fungal diagnostics.

About the Workshop:

Led by renowned experts in the field, this workshop offers immersive, practical training in key diagnostic techniques, including:

- Direct microscopic examination of clinical specimens
- Fungal culture techniques and identification of morphologic features
- Histopathological staining for fungi in tissue samples
- DNA extraction methods for mould and yeasts
- PCR analysis, sequence data interpretation, and troubleshooting
- Antifungal susceptibility testing and therapeutic drug monitoring (TDM)

By mastering these essential mycology techniques, participants will be better prepared to deliver timely diagnoses and contribute to improved patient care and outcomes in the management of fungal diseases.

Join us in this enriching, hands-on learning experience, and take an active role in advancing fungal diagnostics and improving healthcare outcomes. Together, let's shape a healthier, fungus-free future.

WHO SHOULD ATTEND?

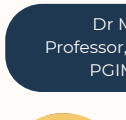
- **Post graduate students pursuing their MD/DNB (Microbiology)**
- **Microbiologists aiming to establish /enhance mycology diagnostic services**
- **Practicing clinical microbiologists**
- **Laboratory technologists working in mycology**
- **Anyone seeking to expand their knowledge and practical skills in medical mycology**

OBJECTIVES

- Understand the specific terminologies used in mycology
- Perform and interpret direct microscopic examinations for fungal elements
- Apply standard culture methods and identify fungi based on morphological features
- Identify a broad spectrum of fungal isolates
- Gain a foundational understanding of molecular diagnostic techniques including DNA extraction, PCR, and sequence analysis
- Conduct antifungal susceptibility testing and TDM for yeasts

WORKSHOP FACULTY

Dr M.R. Shivprakash
Professor, Dept. of Microbiology
PGIMER, Chandigarh



Dr. Jayanthi Savio,
Professor & Head, Dept. of Microbiology
St. John's Medical College, Bangalore

Dr P Uma Bala,
Senior Consultant and Head, Dept. of Microbiology, NIMS, Hyderabad

Dr. Rungmei Marak,
Professor & Head Dept. of Microbiology SGPGI, Lucknow

Dr Subramanian Swaminathan,
Senior Consultant, Gleneagles Global Health City, Chennai

Dr Sandhya Sundaram,
Professor, Dept. of Pathology
SRIHER, Chennai

Dr Anupma Jyoti Kindo,
Professor, Dept. of Microbiology
SRIHER, Chennai

Dr T Premamalini,
Professor, Dept. of Microbiology
SRIHER, Chennai

The 15th National Conference of the Indian Society of Medical Mycologists (ISMM), held from 20th to 23rd February 2025 at Sri Ramachandra Medical College and Research Institute in Porur, Chennai, brought together a dynamic mix of researchers, clinicians, and microbiologists from across India and abroad. The conference opened with four pre-conference workshops on 20 February, which saw enthusiastic participation from 47 students. These hands-on sessions laid the groundwork for a deeply engaging academic experience. With 230 delegates registered including faculty, postgraduate students, and laboratory personnel, representing different regions of the country and abroad. The event was a robust gathering of minds dedicated to advancing fungal disease research and management.

Organizing committee

Presidential oration by Dr. Jayanti Savio

A. Nucleic acid and proteomics based identification of medically important fungi
B. Detection of Pneumocystis jirovecii and Aspergillus spp. with drug resistance by Real time PCR.
C. Therapeutic drug monitoring assay methods.
D. Malassezia- Phenotypic and molecular identification with antifungal susceptibility testing.

Indian Society of Medical Mycologists

Ranchi

ISMM

16th National Biennial Conference of Indian Society of Medical Mycologists 2027

Fungal infection in the changing world : Climate, Environment, Host and One Health

16th National Biennial Conference of Indian Society of Medical Mycologists

04-07 February, 2027

Rajendra Institute of Medical Sciences
Ranchi, Jharkhand

visit us at : www.ismmconference.com

Announcement Brochure

ISMM Council Members

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Vice President	-	Dr. Malini R Capoor, *New Delhi*
General Secretary	-	Dr. Shukla Das, *New Delhi*
Joint Secretary	-	Dr. Pratibha Kale, *New Delhi*
Treasurer	-	Dr. Harsimran Kaur, *Chandigarh*

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Dr. Vijaylata Rastogi (West), *Ajmer*

Dr Manoj Kumar (East), *Ranchi*

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Ex-officio Member (Immediate Past President)

Dr. Jayanthi Savio, *Bengaluru*

Editor, ISMM Newsletter

Dr. Savitri Sharma, *Hyderabad*

ISMM Website Editor

Dr. Vinaykumar Hallur, *Bhubaneshwar*

ISMM Zone classification: Finalised by ISMM council on 25-7-23

North Zone	:	Chandigarh, Delhi, Himachal Pradesh, Jammu and Kashmir, Ladakh, Uttarakhand, Uttar Pradesh
East Zone	:	Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, Sikkim, Bihar, Jharkhand, Odisha, West Bengal
Central Zone	:	Chhattisgarh, Madhya Pradesh, Telangana
West Zone	:	Goa, Gujarat, Maharashtra, Rajasthan, Punjab, Haryana
South Zone	:	Andhra Pradesh, Karnataka, Kerala, Puducherry, Tamil Nadu, Andaman and Nicobar Islands, Lakshadweep

This newsletter is Sponsored by MSD Pharmaceuticals Pvt. Ltd.

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