

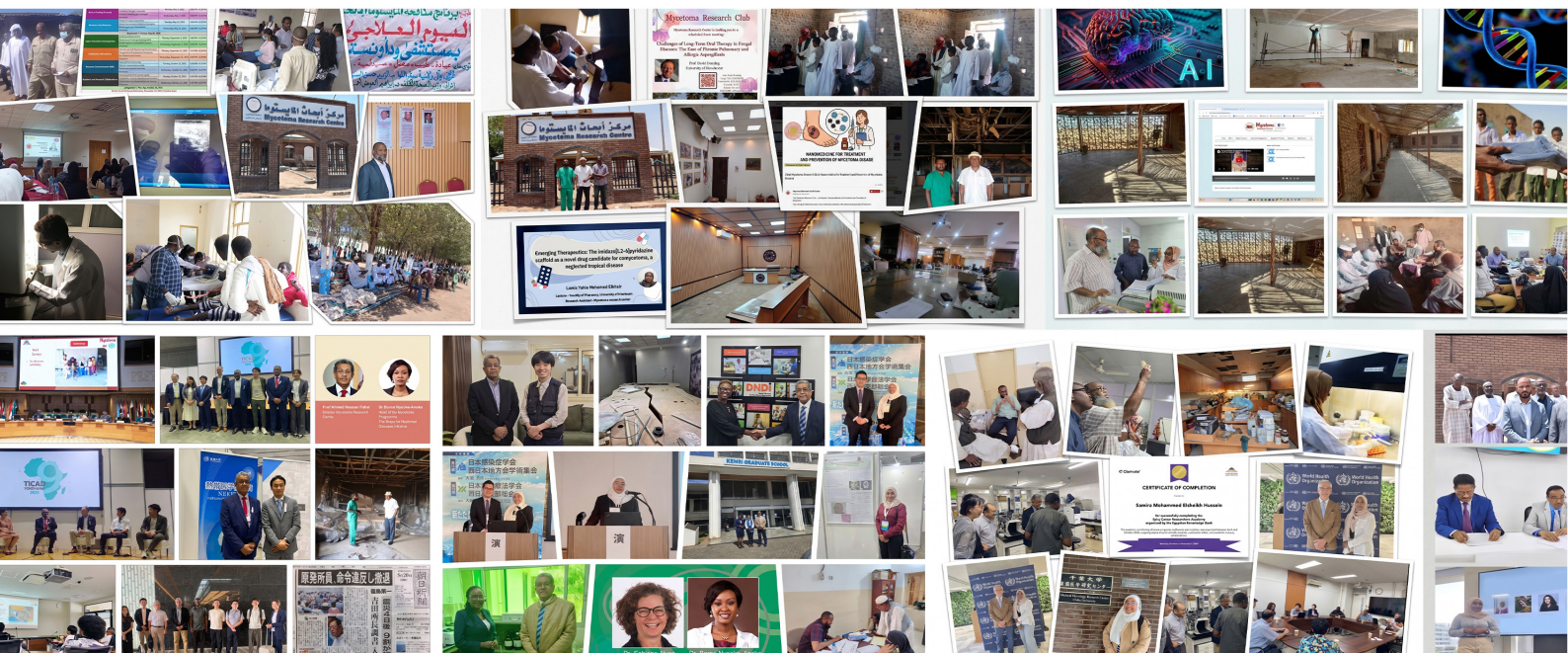


The Mycetoma Research Centre University of Khartoum

WHO Collaborating Centre on Mycetoma & Skin NTDs

The 2025 Annual Report

Rising Above: Rebuilding Hope, Restoring Life



The 2025 Annual Report

Rising Above: Rebuilding Hope, Restoring Life

Contents

- 2025 Annual Report
- Director's Message
- 2025 at a Glance
- The Recovery Journey
- Research, Development, & Innovation
- Scientific Publications
- International Advocacy & Collaboration
- Global Collaborations & Strategic Partnerships
- Conferences & Symposia
- Mycetoma Ambassadors
- Enhancing Clinical Services & Patient Care
- Capacity Building, Education & Training
- The Mycetoma Research Club
- The MRC Research Groups
- Postgraduate Students
- Mycetoma Young Researchers Association
- Community Engagement & Public Health Outreach

The 2025 Annual Report

Rising Above: Rebuilding Hope, Restoring Life



This report chronicles our journey through 2025, a year defined by profound national and regional crises. It is the story of a year in which we refused to merely survive, choosing instead to actively innovate and adapt. Against the heaviest of odds, we stood firm to protect vulnerable lives, advance groundbreaking clinical research, deepen community engagement, and pioneer the reconstruction of resilient health systems.

Director's Message

Rising Above the Rubble

Dear Friends, Partners, and Colleagues,

As we reflect on the trials and triumphs of 2025, we look back on a year that tested the absolute limits of our institutional endurance. It was a period defined by the stark, war-imposed destruction of our beloved physical home at the Mycetoma Research Centre (MRC) in Khartoum. Yet, as I write this message, my overwhelming sentiment is not one of grief, but of profound gratitude. I am profoundly moved by the radical resilience, fierce dedication, and unyielding spirit of our team, which carried us forward through the darkest chapters of this crisis.

Despite a landscape of pervasive uncertainty and acute adversity, our core mission remained entirely unshaken: to advance scientific discovery, elevate clinical competencies, and aggressively improve the quality of life for patients afflicted by mycetoma and other skin-related Neglected Tropical Diseases (Skin NTDs).

Our operations throughout 2025 were shaped by two parallel, deeply interconnected journeys. On one front, we faced the monumental task of rebuilding hope from the ground up, rehabilitating our fractured infrastructure, establishing secure decentralised sentinel hubs like our satellite centre in Kassala, and securing critical logistics in highly unstable environments. On the parallel front, we refused to let our scientific and humanitarian momentum stall. We maintained continuous clinical services for displaced populations, expanded our open-access clinical trial pathways for life-dignity therapeutics such as Fosravuconazole, and aggressively supported our young researchers and healthcare providers with the tools and training necessary to manage complex pathologies under wartime constraints.

We did not walk this difficult path alone. Thanks to the extraordinary, swift, and generous intervention of our national and international partners, such as the Drugs for Neglected Diseases initiative (DNDi), the World Health Organisation, and our dedicated academic network, the MRC has steadily risen from the rubble. Together, we have painstakingly begun restoring both our advanced laboratory capabilities and our frontline patient services, proving that our institutional foundations are built on human conviction rather than brick and mortar.

This entire year was guided by a simple yet absolute belief: that by uniting to rise above adversity, we possess the collective power to rebuild hope and restore health. The year 2025 did not break us; it forged us into a stronger, more agile, and deeply unified institution.

As we now push forward into 2026, we carry a renewed spirit of resilience, cross-border collaboration, and an unwavering commitment to the marginalised populations we serve. The road to complete reconstruction is long, but our resolve is total. We warmly invite you to join us on this transformative journey, whether as a strategic partner, a financial supporter, or a global advocate, as we continue rebuilding fractured health systems, pioneering clinical innovation, and bringing life-saving hope to every patient affected by mycetoma and skin NTDs.

With my highest esteem, deepest appreciation, and warmest regards



Prof Ahmed Hassan Fahal

MBBS, FRCS, FRCSI,
FRCS(Gal), MD, MS,
FRCPath, FRCP(London)
Professor of Surgery

2025 At a Glance

https://mycetoma.edu.sd/?page_id=478

The year 2025 was a defining chapter in the history of the Mycetoma Research Centre, a period marked by profound challenges and historic triumphs that stood as a testament to the power of human resilience. Amidst overwhelming adversity, our collective spirit remained an unbroken guiding light of hope. Through extraordinary adaptation and decisive action, our teams engineered workflows that overcame immense structural obstacles and safeguarded our humanitarian mission.



His Excellency, the Federal Minister of Health, Dr Haytham Mohamed Ibrahim, visited the MRC

The Mycetoma Research Centre (MRC) was honoured to host an official visit from His Excellency, the Federal Minister of Health, Dr Haytham Mohamed Ibrahim. The primary objective of His Excellency's visit was to conduct a comprehensive on-site assessment of the war-related structural damage to the Centre's infrastructure and to demonstrate profound solidarity with our scientific and medical teams. Recognising the MRC's critical humanitarian role, the Federal Minister actively leveraged his office to engage key international and national donors. This high-level advocacy successfully secured a substantial financial endowment dedicated exclusively to the reconstruction of the centre. This critical ministerial intervention marks a transformative milestone in our institutional recovery journey, providing the vital resources necessary to restore our frontline clinical and diagnostic services.



WHO Collaboration on Mycetoma

Unite Against Mycetoma: Pioneering Solutions and Urgent Call to Action



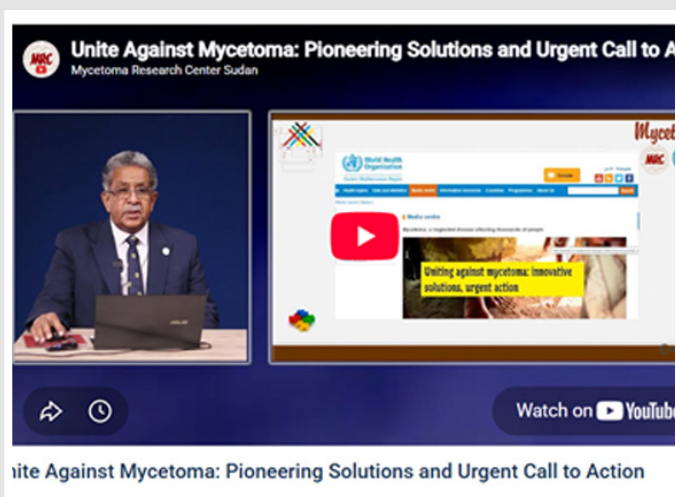
On Wednesday, July 16, 2025, a regional webinar was jointly organised by the WHO Regional Office for the Eastern Mediterranean (EMRO), the Drugs for Neglected Diseases initiative (DNDi), and the Mycetoma Research Centre (MRC). Under the theme 'Unite, Act, Eliminate,' the event brought together health professionals, researchers, policymakers, and community representatives to coordinate global efforts against this highly neglected, debilitating tropical disease.

The webinar featured key presentations from two leading authorities in the field: Professor Ahmed Fahal, Director, MRC, who detailed the centre's holistic, multi-disciplinary management approach, which integrates clinical management, community-based screening, local healthcare training, and social support. He noted that while these strategies have successfully reduced disease severity and improved patient quality of life, continuous resource mobilisation is urgently needed to address ongoing challenges such as delayed diagnoses and socio-economic burdens.

Dr Borna Nyaoke-Anoke, Head of Mycetoma Programme, DNDi highlighted milestones in innovative drug development, including the launch of the world's first double-blind clinical trial for mycetoma. She outlined strategic projects focused on novel drug delivery systems, repurposing medicines, and boosting local manufacturing to ensure affordable, accessible treatments.

Moderated by WHO experts, the session concluded with active discussions emphasising that eliminating mycetoma requires sustained global funding, cross-border collaboration, the integration of mycetoma into broader national NTD programmes, and a unified commitment to achieving equitable access to diagnostics and therapeutics.

In closing, the webinar served as a reminder that while progress has been made, there is still a long road ahead. The fight against mycetoma requires sustained global commitment, innovative scientific research, and a focus on equitable access to diagnosis and treatment. As the international community continues to unite in this cause, it is hoped that future generations will view mycetoma not as a neglected disease, but as a defeated one, an achievement made possible through continued collaboration, innovation, and urgent action.



Links

https://mycetoma.edu.sd/?page_id=105

<https://cmm-failsafe.com/webinar-united-against-mycetoma-innovative-solutions-urgent-action/>

<https://www.emro.who.int/media/news/mycetoma-a-neglected-disease-affecting-thousands-of-people.html>

<https://www.who.int/news-room/events/detail/2025/07/16/default-calendar/uniting-against-mycetoma--innovative-solutions--urgent-action>

The Recovery Journey

The Infrastructure Rehabilitation Roadmap: From Vision to Reality

By October 2025, the monumental task of physical reconstruction transitioned from a visionary blueprint into active mobilisation, catalysed by critical foundational support from the Sudatel Telecom Company-Sudan. This initial corporate intervention provided the vital momentum to begin rehabilitating the Mycetoma Research Centre (MRC) facilities. This breakthrough served as a cornerstone, inspiring a coalition of diverse international and domestic partners to join our rehabilitation journey and systematically turn hope for recovery into a tangible reality..

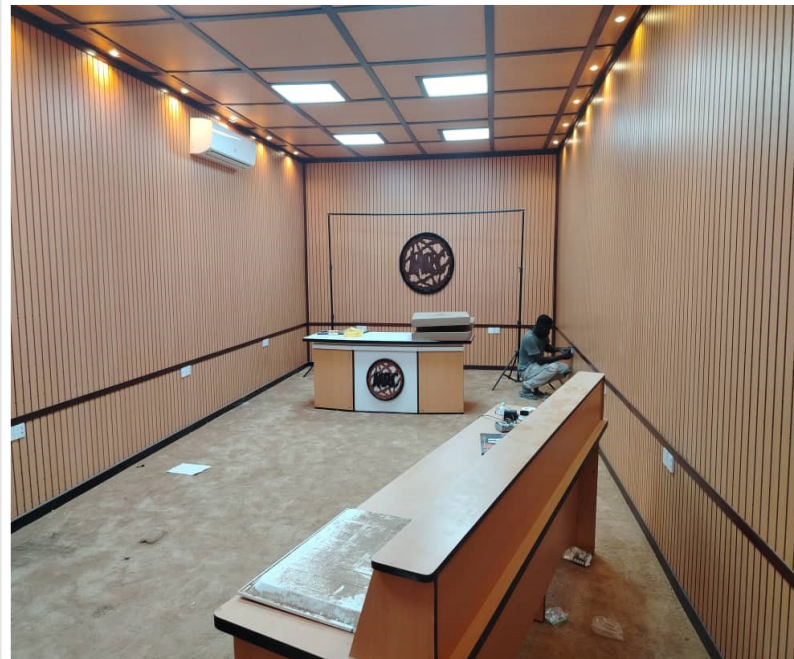


Through the high-level advocacy of His Excellency, the Federal Minister of Health, Dr Haythum Mohamed Ibrahim, the MRC's infrastructure recovery was further accelerated by a major philanthropic endowment from a Qatari Donor.

Concurrently, local solidarity was beautifully exemplified by a young Sudanese businessman who made a generous personal donation that fully equipped the centre with modern office equipment, essential stationery, an independent solar energy system, a high-speed internet network, and a comprehensive security camera system. This blend of renewable green energy and digital connectivity successfully transformed our restored workspaces into a modern, crisis-resilient environment.



With each passing month, the physical and operational landscape of the Mycetoma Research Centre shifted dynamically. What initially loomed as an insurmountable, overwhelming recovery effort gradually transformed into a calculated, steady march toward total institutional renewal. By systematically pairing international capital with localised technological innovation, the MRC has not simply rebuilt its past; it has engineered a more resilient future. The successful execution of this roadmap stands as an unassailable proof that when institutional fidelity is backed by coordinated public, private, and international solidarity, scientific excellence can never be truly displaced.



Sudan TV interviewed Prof Fahal and Prof Karrar

In a televised interview on Sudan TV, Prof. Ahmed Fahal and Prof. EL Zein Karrar provided a poignant assessment of the devastating toll the ongoing conflict in Sudan has taken on the Mycetoma Research Center (MRC) at Soba University Hospital, its vulnerable patients, and the national health system. The professors highlighted the tragic loss of over four decades of priceless biological specimens, genetic biobanks, and specialised laboratory infrastructure accumulated at the world's sole WHO Collaborating Center on Mycetoma. This physical and operational destruction has halted vital global clinical trials and severed continuous antifungal treatment regimens for thousands of displaced, impoverished patients, drastically increasing the incidence of preventable limb amputations and late-stage disease complications. Beyond the center itself, the professors emphasised that the paralysis of over seventy percent of Sudan's healthcare facilities and the displacement of top medical researchers represent a generational loss for global tropical health, issuing an urgent appeal to national authorities and international health partners to mobilise emergency support, secure critical drug supplies, and rebuild Sudan's scientific and medical legacy.



Research, Development and Innovation

In 2025, we made significant strides in research and innovation, reinforcing our commitment to advancing the scientific understanding and treatment of mycetoma and activities were conducted, which included:

Early Access Cohort Protocol for Fosravuconazole to Treat Eumycetoma in Sudan

While conventional wisdom dictates that sound scientific research is impossible during times of national crisis, the MRC has spent the year 2025 rewriting the rules of crisis science. Despite widespread scepticism from international entities about safety and data-collection capacity, we refused to allow our clinical research pipelines to dissolve. Instead, backed by the vital support of DNDi, we launched a landmark Early Access Cohort Protocol for Fosravuconazole in Sudan.

The battlefield for this breakthrough was the Kassala Mycetoma Satellite Centre. Conducting this study in Eastern Sudan, under the direct stewardship of the MRC, is undeniable proof of the MRC resilience. We did not compromise on quality; the trial is being conducted with impeccable scientific and ethical rigour, with 50 patients enrolled to date. Furthermore, this project became an engine for education, delivering world-class training in Good Clinical and Medical Laboratory Practices to local frontline healthcare workers, proving that even in a storm, excellence remains our baseline..



Kassal Teaching Hospital, the clinical study site

The investigational therapeutic, Fosravuconazole, was developed, manufactured, and generously donated by the Eisai Pharmaceutical Company of Japan. Securing the cross-border transport of this specialised medicine into an active conflict zone proved to be an immense logistical and geopolitical challenge. Navigating stringent international customs, disrupted shipping lanes, and complex regulatory hurdles required eighteen (18) months of persistent administrative efforts. Ultimately, these efforts culminated in the safe delivery of the therapeutic consignment to the Kassala Mycetoma Satellite Centre, ensuring the continuity of our clinical trials. The study started officially on the second of August 2025.



Study Team Discussion



Mycetoma Diagnosis Training

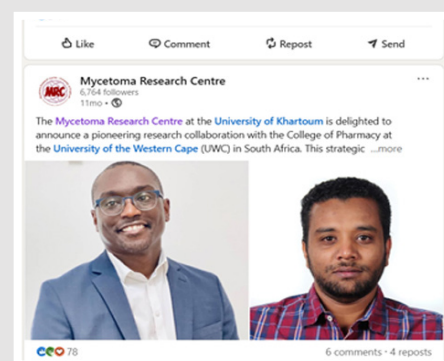
<https://mycetoma.edu.sd/?p=6719>

Drug Discovery through Molecular Docking

The Mycetoma Research Centre has advanced its drug discovery pipeline by utilising *in silico* molecular docking, a sophisticated computational approach for new drug discovery. This virtual screening engine functions as a high-throughput digital filter, modelling thousands of small-molecule interactions with targeted fungal enzymes at the atomic level to predict binding affinities and structural compatibility before physical compound synthesis. Current computational efforts are systematically focused on disrupting critical fungal survival mechanisms, specifically targeting the CYP51 enzyme to compromise cell membrane synthesis and Chitin Synthase to degrade cell wall integrity. Initial phases of this screening have yielded highly promising results, successfully isolating several high-affinity lead molecules with optimal binding configurations and favourable predicted pharmacokinetic properties. Moving forward, the centre will transition these digitally identified leads directly into targeted *in vitro* validation assays, maximising laboratory resource efficiency and accelerating the pre-clinical development of novel, life-saving antifungals for marginalised populations.

Nanotechnology Collaboration with the University of the Western Cape

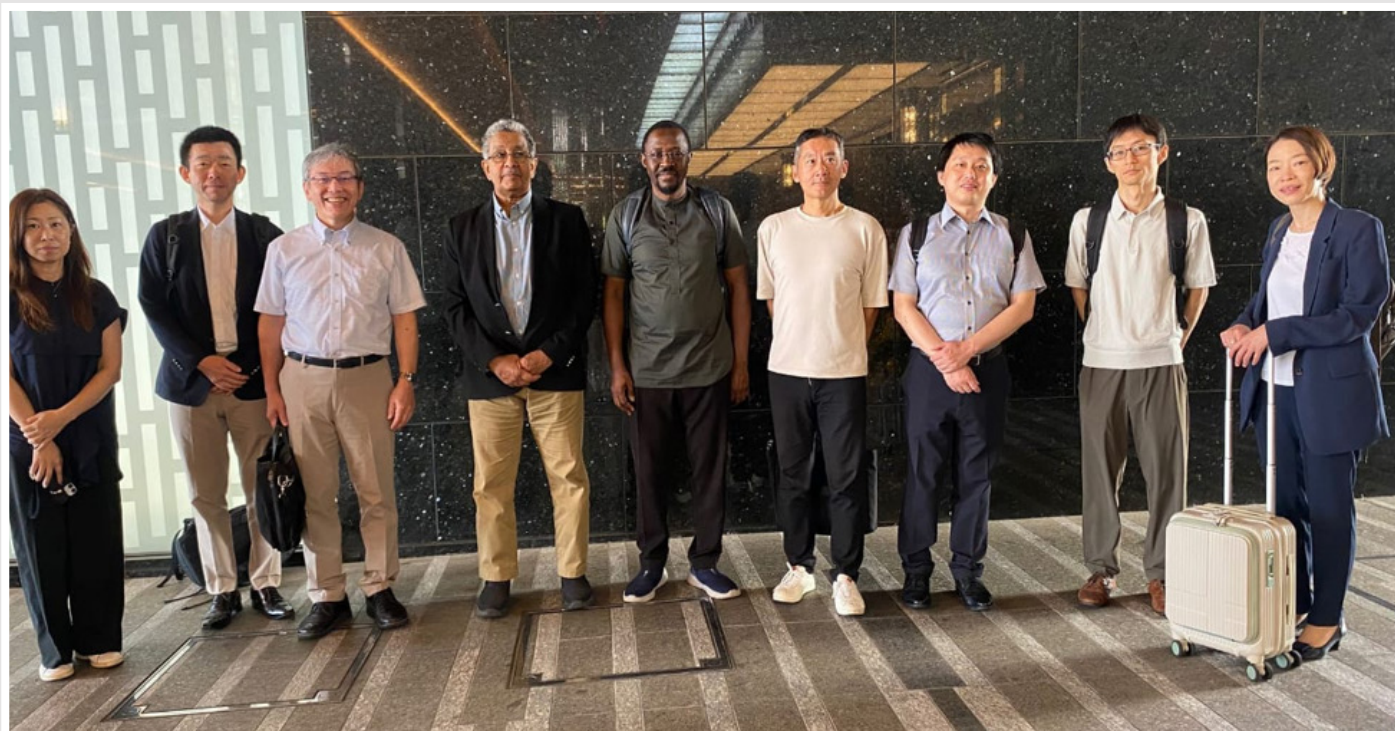
The Mycetoma Research Centre has launched a landmark scientific collaboration with the University of the Western Cape in South Africa to harness nanotechnology and transform treatment outcomes for mycetoma. This innovative partnership focuses on encapsulating conventional antifungal medications within engineered, biocompatible nanoparticles to overcome the physical barriers presented by dense fungal grains and granulomatous tissue matrices. By re-engineering the drugs at the molecular level, this nano-encapsulation strategy significantly enhances water solubility, protects active ingredients from premature metabolic degradation, ensures targeted delivery to infected tissues, and establishes a controlled, sustained release profile. Preliminary *in vitro* studies in other diseases have successfully demonstrated enhanced drug penetration and sustained-release profiles without inducing cellular toxicity. For patients suffering from both eumycetoma and actinomycetoma, this framework represents a major step toward next-generation treatment regimens characterised by lower required doses, minimised systemic toxicity, direct delivery of antifungals to target the causative organisms, and shortened clinical timelines. Furthermore, the collaboration has been substantially strengthened by the appointment of a dedicated joint PhD scholar to spearhead the upcoming laboratory phases, reinforcing a shared commitment to building sustainable, high-level scientific capacity within the region.



<https://www.tandfonline.com/doi/full/10.1080/17435889.2026.2645392>

The AMED International Collaborative Research Programme

The Mycetoma Research Centre (MRC) at the University of Khartoum is an active consortium member of the International Collaborative Research Programme for Tackling Neglected Tropical Diseases Challenges in African Countries, a prestigious global initiative funded and supported by the Japan Agency for Medical Research and Development (AMED). The MRC's joint project is entitled, "Research on the diagnostics of early or latent eumycetoma: Search for new biomarkers, POC diagnostics, and development of a clinical epidemiology platform."



Spanning from its initial launch through its scheduled conclusion in 2026, this multilateral initiative brings together a powerful network of five premier global institutions:

1. The Mycetoma Research Centre, University of Khartoum, Sudan
2. The Department of Eco-Epidemiology, Institute of Tropical Medicine, Nagasaki University, Japan
3. The Chemical Library Center, Institute of Transformative Bio-Molecules, Nagoya University, Japan
4. The Management Unit of Microbiological Resources, Medical Mycology Research Center, Chiba University, Japan
5. The Graduate School of Human Development and Environment, Kobe University, Japan.

The primary scientific objective of this joint enterprise is the discovery, validation, and isolation of novel antigenic or metabolic molecules required to engineer a highly accurate, field-ready point-of-care (POC) diagnostic test for mycetoma. By integrating advanced chemical libraries with clinical field epidemiology, this ongoing project aims to drastically reduce diagnostic delays and capture latent infections before severe tissue destruction occurs.

Looking Ahead

These research initiatives position the Mycetoma Research Centre at the forefront of innovation in neglected tropical diseases. We remain committed to translating scientific discoveries into tangible improvements in patient care and treatment outcomes.

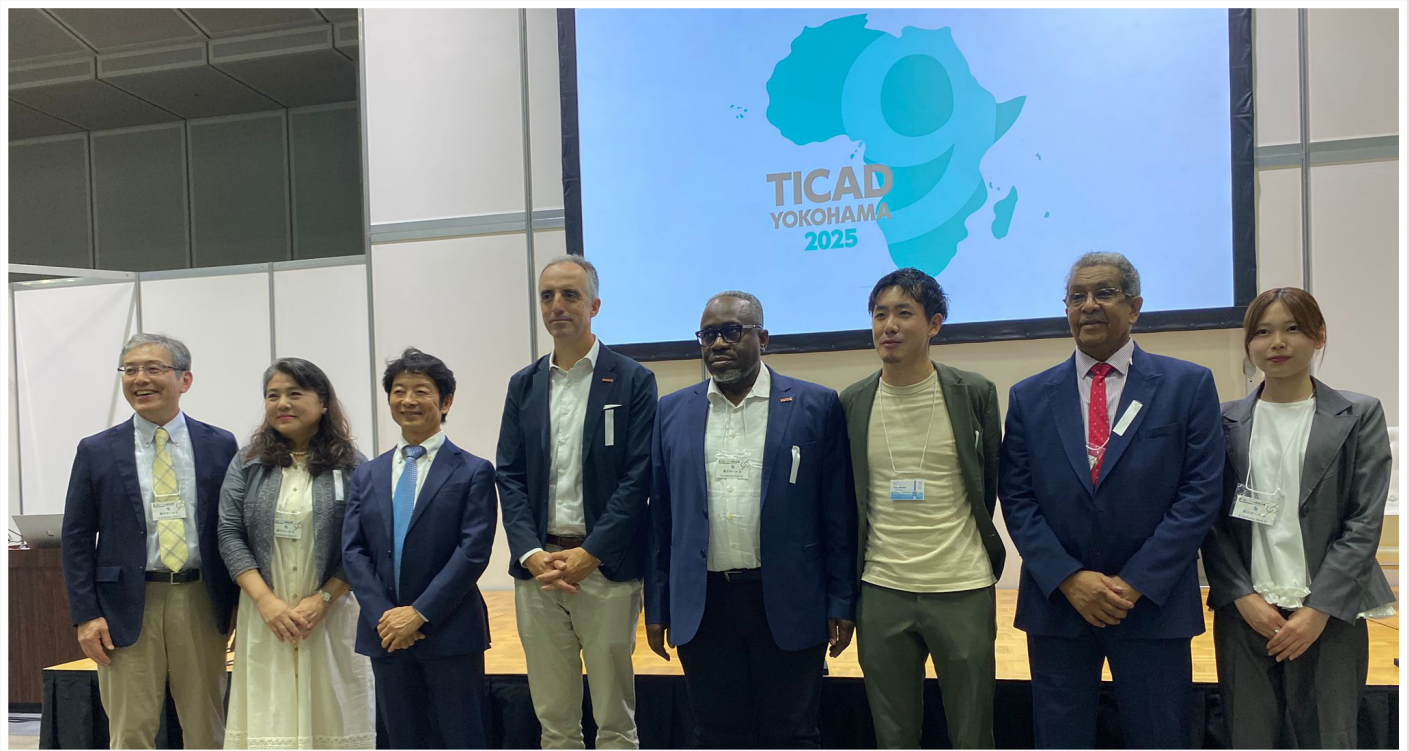
Publications

1. Mohamed AF, Saeed AA, Mohamoud MA, Jama AA, Fahal AH. Mycetoma in Somalia: an updated literature review. *Ann Med Surg (Lond)*. 2025 Jan 9;87(1):204-208. doi: 10.1097/MS9.0000000000002851. eCollection 2025 Jan. PMID: 40109607
2. Chandler DJ, Davey G, Hay RJ, Fahal A; Mycetoma Activity and Severity clinical Scale (MASS) expert panel. Development of the Mycetoma Activity and Severity clinical Scale (MASS): an international Delphi study. *Lancet Infect Dis*. 2025 Feb 26:S1473-3099(24)00808-9. doi: 10.1016/S1473-3099(24)00808-9. Epub ahead of print. PMID: 40023182.
3. Khair RZA, Elkhayrate HYA, Ibrahim MTMM, Fahal AH. Pattern of Limb Ischemia in Khartoum, *International Journal of Medical Case Reports and Reviews*. 2024;3(5):1- 4. DOI: 10.59657/2837-8172.brs.23.052
4. Fahal AH, Smith DJ, Saeed AA, Nyaoke B, Alves F, Asiedu K, Hay R. Global health initiatives and mycetoma management: the unmet promise. *Trans R Soc Trop Med Hyg*. 2025 Feb 4:traf001. doi: 10.1093/trstmh/traf001. Epub ahead of print. PMID: 39901853.
5. Hussein SME, Saeed AA, Fahal AH. Mycetoma management: Therapeutic challenges and the role of pharmacovigilance. *PLoS Negl Trop Dis*. 2025 Feb 20;19(2):e0012827. doi: 10.1371/journal.pntd.0012827. PMID: 39977423.
6. Yoshioka I, Fahal AH, Kaneko S, Cao W, Yaguchi T. Itraconazole resistance in *Madurella fahalii* linked to a distinct homolog of the gene encoding cytochrome P450 14- α sterol demethylase (CYP51). *PLoS Negl Trop Dis*. 2025 Mar 27;19(3):e0012623. doi: 10.1371/journal.pntd.0012623. PMID: 40146733; PMCID: PMC11964275.
7. Ouangré A, Yerbanga IW, Savadogo I, Ouédraogo H, Bado ND, Nagalo A, Traoré F, Dem AK, Bouda SAK, Koulybari DFD, Sawadogo A, Nakanabo Diallo S, Gangneux JP, Fahal AH, Bamba S. Burden of mycetoma in Burkina Faso: case series and systematic review. *Trans R Soc Trop Med Hyg*. 2025 Feb 28:traf015. doi: 10.1093/trstmh/traf015. Epub ahead of print. PMID: 40036719.
8. Fahal AH, Ahmed ES, Saeed AA, Fahal LA, Hussein SME, Nakano K, Hata K, Alves F, Nyaoke BA. A balancing act: Navigating the advantages and challenges of pioneering mycetoma treatment in Sudan-A landmark trial by the Mycetoma Research Center. *PLoS Negl Trop Dis*. 2025 Apr 21;19(4):e0013000. doi: 10.1371/journal.pntd.0013000. PMID: 40257994; PMCID: PMC12011228.
9. Konings M, Siddig E, Eadie K, Minlekib CP, Faye M, Sow D, Fahal A, Verbon A, van de Sande W. The development of a multiplex recombinase polymerase amplification reaction to detect the most common causative agents of eumycetoma. *Eur J Clin Microbiol Infect Dis*. 2025 Apr 30. doi: 10.1007/s10096-025-05134-4. Epub ahead of print. PMID: 40304898.
10. Ma J, Eadie K, Konings M, Fahal A, Verbon A, van de Sande WWJ. Ibrexafungerp prolongs survival and reduces the eumycetoma grain size in *Galleria mellonella* infection models of two different causative agents of eumycetoma. *J Antimicrob Chemother*. 2025 Apr 30:dkaf133. doi: 10.1093/jac/dkaf133. Epub ahead of print. PMID: 40304084.
11. Abdulazeem Abbass O, Hassan AAA, Hamed RHA, Saeed AA, Fahal AH. Orbital actinomadura madurae actinomycetoma: Case report and literature review. *PLoS Negl Trop Dis*. 2025 Apr 29;19(4):e0013035. doi: 10.1371/journal.pntd.0013035. PMID: 40299927; PMCID: PMC12040158.
12. Cavanaugh AM, Ribeiro Dos Santos A, Freitas DFS, Venturini J, Fahal A, Azevedo C, Gold JAW. Quality of Life, Disability, and Fungal Neglected Tropical Diseases. *Curr Fungal Infect Rep*. 2025 Apr;19(1):4. doi: 10.1007/s12281-025-00503-0. PMID: 40927623; PMCID: PMC12416368.
13. Chu WY, Fahal AH, Ahmed ES, Bakhiet SM, Bakhiet OE, Fahal LA, Mohamed AA, Mohamedelamin ESW, Bahar MEN, Attalla HY, Siddig EE, Mhmoud NA, Musa AM, Oyieko P, Egondi T, Brüggemann RJ, Hata K, Strub-Wourgaft N, Alves F, Nyaoke BA, Zijlstra EE, Dorlo TPC. Pharmacokinetics and Pharmacodynamics of Fosravuconazole, Itraconazole and Hydroxyitraconazole in Sudanese Patients With Eumycetoma. *J Infect Dis*. 2025 May 28:jiaf279. doi: 10.1093/infdis/jiaf279. Online ahead of print. PMID: 40433693.

14. Abugessaisa I, Konings M, Manabe RI, Murphy CM, Kawashima T, Hasegawa A, Takahashi C, Tagami M, Okazaki Y, Eadie K, Lim W, Doyle S, Verbon A, Fahal AH, Kasukawa T, van de Sande WWJ. Iron regulatory pathways differentially expressed during *Madurella mycetomatis* grain development in *Galleria mellonella*. *Nat Commun*. 2025 Jun 25;16(1):5324. doi: 10.1038/s41467-025-60875-2. PMID: 40562743; PMCID: PMC12198395.
15. Salah ME, Fearon Scales ML, Habib K, Alhamwi F, Abdelwahab S, Ahmed Y, Khalid MM, Smith DJ, Fahal A. Global sociodemographic, clinical, and epidemiological profiling of patients with mycetoma: A systematic review. *PLoS Negl Trop Dis*. 2025 Aug 14;19(8):e0013217. doi: 10.1371/journal.pntd.0013217. PMID: 40811735; PMCID: PMC12617881.
16. Mohammed Hussein, Elshimaa Ali, Yassin Kamal, Ali Elhouni, Yousif Eltayeb, Ali Awadella Saeed, Ahmed Hassan Fahal. The Utility of Artificial Intelligence in the Management of Dengue Fever- *Trans R S Trop Med Hyg*- traf103, <https://doi.org/10.1093/trstmh/traf103>
17. Hassan Fahal A, Ahmed AO, El Hassan L, Saeed AA. The contribution of mycetoma grains to suboptimal disease management. *Nat Commun*. 2025 Nov 7;16(1):9855. doi: 10.1038/s41467-025-64908-8. PMID: 41203632; PMCID: PMC12594801.
18. Erber, Astrid and Dahal, Prabin and Bonifaz, Alexandro and Brack, Matthew and Brodersen, Joanna and Harriss, Eli and Jeleff, Maren and Maguire, Brittany J. and Nyaoke, Borna and Regensburger, Sandra and Srambickal, Amala and Strub Wourgaft, Nathalie and Tirado-Sanchez, Andrés and Weichselberger, Tobias and Fahal, Ahmed H. and Zijlstra, Eduard E. and Guérin, Philippe J., A Systematic Review of the Clinical Study Landscape for Eumycetoma, 1990-2024. Available at SSRN: <https://ssrn.com/abstract=5368722> or <http://dx.doi.org/10.2139/ssrn.5368722>
19. Saeed AA, Hussein SME, Al Zamel AM, Eisa LB, Daud AOA, Seedahmed HSM, Ahmed FOI, Al-Jabali TAKT, Kheir E, Fahal AH. Medical and health students' insights into mycetoma: A survey-based study on knowledge and clinical practices. *PLoS Negl Trop Dis*. 2025 Oct 9;19(10):e0013583. doi: 10.1371/journal.pntd.0013583. PMID: 41066411; PMCID: PMC12510600.
20. Bedaso WK, Wendimu DE, Hussein SME, Saeed AA. Clinical presentation and treatment outcomes of patients with mycetoma in Ethiopia: a case series. *Trans R Soc Trop Med Hyg*. 2025 Sep 15:traf098. doi: 10.1093/trstmh/traf098. Epub ahead of print. PMID: 40971770.
21. Kheir E, Ali Q, Fahal A. Obstacles to effective implementation of interprofessional education in Sudan. *BMC Med Educ*. 2025 Oct 17;25(1):1444. doi: 10.1186/s12909-025-08021-w. PMID: 41107818; PMCID: PMC12534976.
22. Yoshioka I, Fahal AH, Sow D, Kaneko S, Mori Y, Ban S, Yaguchi T. Simultaneous Detection of Four *Madurella* Species Using Loop-Mediated Isothermal Amplification (LAMP) for Eumycetoma Diagnosis. *Mycopathologia*. 2025 Oct 29;190(6):105. doi: 10.1007/s11046-025-01019-4. PMID: 41152542; PMCID: PMC12568910.
23. Smith DJ, E Silva de Azevedo CMP, Fahal A, Lipner SR, Grijsen ML, Hay R. Approach to Diagnosing and Managing Implantation Mycoses. *Cutis*. 2025 Sep;116(3):88-104. doi: 10.12788/cutis.1266. PMID: 41183475.
24. Lydia Mosi, Bishwanath Acharya, Kingsley Asiedu, Adeola Bamisaiye, M. Eric Benbow, Dziedzom De Souza, Lynne Elson, Ahmed Fahal, Roderick Hay, Ruth Nyangacha, Charles Quaye, Aisha Shitu Sa'id, Dallas Smith, and Heather Jordan. Integrated Action for Skin NTDs: Deconstructing Transmission, Addressing Knowledge Gaps, and Championing One Health Strategies. *Nature Communications*-accepted

International Advocacy & Collaboration

The 9th Tokyo International Conference on African Development



The Mycetoma Research Centre participated in the 9th Tokyo International Conference on African Development (TICAD9) in Yokohama, Japan (20–22 August 2025). Represented by Director Professor Ahmed Fahal and Research Assistant Ms Lubna Sulayman Elnour, the delegation showcased the MRC's research, strengthened international partnerships, and advanced global advocacy for mycetoma as a neglected tropical disease (NTD). The visit was organised by the Institute of Tropical Medicine at Nagasaki University and facilitated by Professor Satoshi Kaneko. During the visit, the MRC participated in different activities, including:

High-Level Symposia & Conference Events

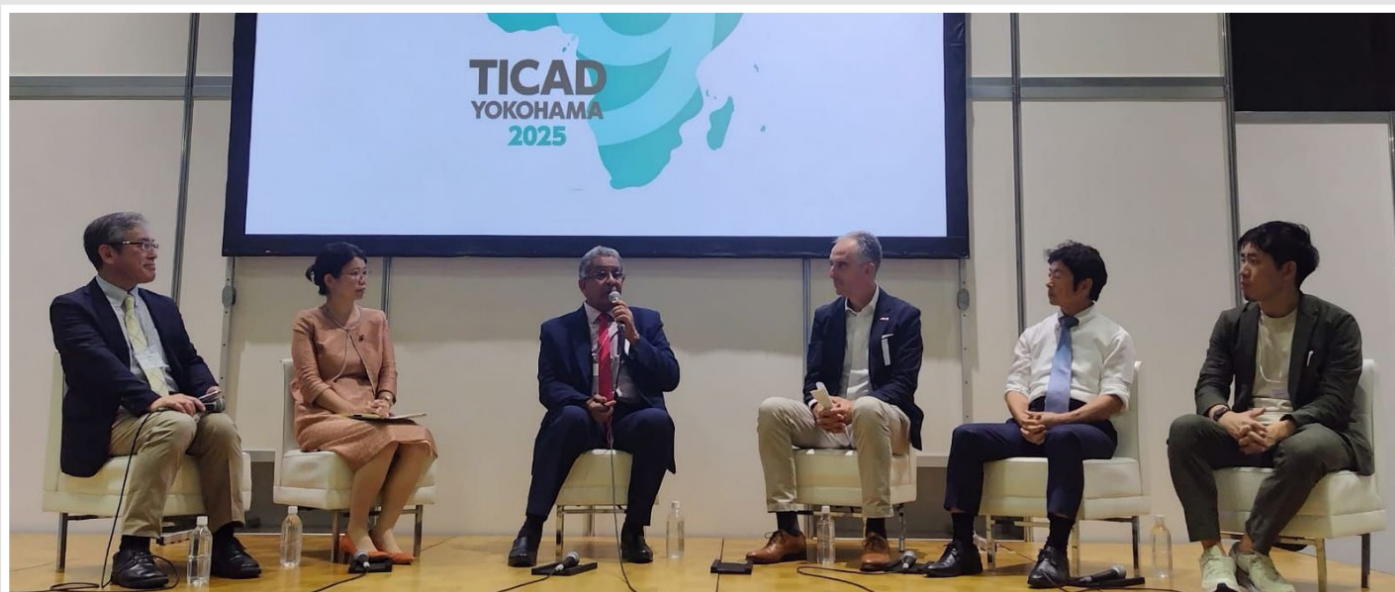
The MRC actively contributed to several strategic forums during the TICAD9 conference to foster multi-stakeholder partnerships across industry, academia, government, and youth:

- **Nagasaki University Symposium:** Prof Fahal addressed the high-profile session “Co-Creating with Africa to End NTDs: Partnerships Across Industry, Academia, Government, and Youth.” Panellists included HE Dr Ayano Kunimitsu (Member of the House of Representatives of Japan), Dr Luis Pizarro (Executive Director, DNDi), and Dr Osamu Kunii (CEO, GHIT Fund). The session focused on resource mobilisation, policy advocacy, and collaborative research to accelerate NTD diagnosis and treatment.

- **Kyushu University Forum:** The delegation participated in “The Expansion of the Portable Health Clinic in Africa” symposium, which culminated in the signing of a landmark Memorandum of Understanding (MoU) between HE Ambassador Elrayih Hyduob, Sudan Ambassador in Japan and Professor Tatsuro Ishibashi, the President of Kyushu University, to formalise educational and research collaboration.



•Association of AIDS and Relief (AAR) Japan Symposium: The MRC engaged in discussions regarding humanitarian relief, health crises, and disability inclusion in Sudan and Uganda. Prof Fahal held targeted meetings with AAR leadership, including Chairperson Dr Yukie Osa and President Yoshiteru Horie, to explore mutual institutional support mechanisms.



Institutional Networking and Strategic Outcomes

During these meetings, the MRC delegation held bilateral meetings with long-standing partners, including the Drugs for Neglected Diseases initiative (DNDi) executive team, Dr Luis Pizarro and Dr Daisuke Imoto, reaffirming joint commitments to staff development and the MRC research agenda. Additionally, strategic channels for student exchanges and shared seminars were established during a meeting with Professor Kita, Dean of the School of Tropical Medicine and Global Health at Nagasaki University.

Through these engagements, TICAD9 served as a vital platform to expand the MRC's international footprint, secure prospective funding avenues, and cement the collaborative ties necessary to deliver effective therapeutics and diagnostics to endemic regions.

The MRC extends its sincere appreciation to Professor Satoshi Kaneko, Dr Mami Hitachi, Dr Wataru Kagaya, and the team at Nagasaki University for their exceptional organisation and professional support throughout the event.

International Guest Lecture at the University of Nagasaki

In August 2025, Professor Ahmed Fahal, Director of the Mycetoma Research Centre, delivered a guest lecture on mycetoma at the University of Nagasaki, Japan. Faculty members from the School of Tropical Medicine and postgraduate research students attended the event in large numbers. During the session, Professor Fahal explored the complex nature of the disease, outlining historical and contemporary milestones in its diagnosis and clinical management. He concluded with a comprehensive overview of the MRC's pioneering research initiatives and institutional achievements, further strengthening international academic ties.





The Asahi Shimbun

The Asahi Shimbun, founded in 1879, is one of Japan's oldest and most respected daily newspapers. Recognised as a newspaper of record, it is known for its accurate, balanced reporting, in-depth investigations, and progressive stance on issues such as transparency, human rights, and social justice. The paper covers politics, economics, society, culture, and international affairs, serving a wide readership in Japan and among the Japanese diaspora. With a strong network of journalists, it remains a vital source of news, continuously evolving through its digital and multimedia offerings. Kazuhiro Fujitani, a dedicated journalist with The Asahi Shimbun, had interviewed Prof Fahal on the impact of the Sudan war on mycetoma patients, their medical care, mycetoma research, and the MRC building. The interview was very informative. It was published in The Asahi Shimbun.



Global Collaborations and Strategic Partnerships

As the conflict in Sudan intensified, the majority of international collaborators and sponsors, constrained by escalating security risks and rigid institutional policies, understandably suspended or withdrew their active operations. This sudden withdrawal forced the Mycetoma Research Centre to confront the stark and immediate possibility of institutional collapse. Most critically, hundreds of vulnerable mycetoma patients currently undergoing active clinical therapy faced a catastrophic interruption of their treatment regimens. For these individuals, a disruption in specialised care meant unavoidable disease progression, a heightened risk of recurrence, permanent disability, and preventable limb amputations. Yet, even against the backdrop of this widespread institutional retreat, a dedicated nucleus of core partners stood remarkably firm with the MRC, refusing to abandon the centre or its patients during its hour of greatest need.

The international team at the Drugs for Neglected Diseases initiative (DNDi), spanning both the Geneva and Nairobi offices, demonstrated exemplary solidarity and unwavering camaraderie during this challenging period.



International Partnerships



We signed a Memorandum of Understanding (MoU) with the University of the Western Cape in South Africa. This partnership is poised to reshape the mycetoma management landscape by advancing the use of itraconazole nanoparticles, which offer a transformative approach to targeted and more effective treatment.

The University of Khartoum signed an MOU with KEMRI, Kenya

Building upon its strategic mission to foster resilient South-South academic alliances, the Mycetoma Research Centre at the University of Khartoum formalised a landmark MOU with the Kenya Medical Research Institute (KEMRI). This high-level bilateral agreement establishes a powerful collaborative framework designed to combine the MRC's world-class clinical expertise in mycetoma management with KEMRI's extensive regional infrastructure in biomedical research and infectious

disease surveillance. By uniting these two premier African institutions, the partnership aims to accelerate the discovery of novel diagnostics, streamline regional epidemiological mapping across East Africa, and create robust, cross-border training pathways for clinical and laboratory professionals. In an era



marked by regional instability and shifting global priorities, this MOU stands as a testament to African scientific self-reliance, creating a unified, sustainable front to combat neglected tropical diseases (NTDs) and directly improving patient care standards across the entire Horn of Africa.

The Nagasaki University, Institute of Tropical Medicine (NEKKEN)

The collaboration between the Mycetoma Research Center and Nagasaki University's Institute of Tropical Medicine (NEKKEN) exemplifies a vital global health partnership that bridges Sudan's frontline clinical expertise with Japan's advanced biomedical research infrastructure. By hosting an MRC Research Assistant at Nagasaki University, this initiative fosters crucial human capacity building and scientific exchange, allowing researchers to leverage state-of-the-art laboratory technologies such as genomic sequencing and molecular diagnostic assay development to address critical gaps in early diagnosis, drug resistance, and epidemiology. Ultimately, this equitable academic exchange accelerates the translation of high-level bench science into field-ready medical tools and strategies, driving progress toward health equity for vulnerable populations affected by mycetoma and other neglected tropical diseases.



Research Meeting at the Medical Mycology Research Center at Chiba University, Japan.



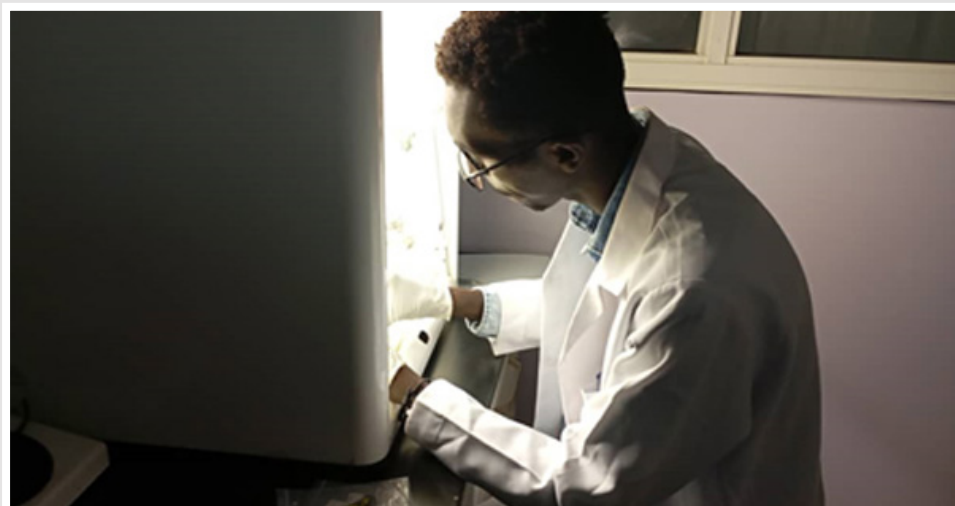
Visit to the Nagasaki University's Institute of Tropical Medicine

National Partnerships

On the national level, we strengthened ties with several prestigious institutions. The Federal Ministry of Health continued its steadfast support for the mycetoma programme. The University of Kassala, Faculty of Medical Laboratory Sciences, emerged as a new operational hub, establishing a good molecular diagnosis setup. The Faculty of Medicine is hosting a weekly clinic that has significantly increased patient access and throughput.



Meeting with the Kassala Governor at Kassala



The Molecular Laboratory at the University of Kassala, Faculty of Medical Laboratory Sciences

Sudatel Telecom Company

The support provided by Sudatel Telecom Group for the rehabilitation of the Mycetoma Research Center (MRC) at Soba University Hospital represents a milestone model of corporate social responsibility (CSR) directly supporting global health and medical research in Sudan. Sudatel's involvement was vital in restoring and upgrading the physical infrastructure of the MRC. Following operational disruptions, infrastructure wear, and severe regional challenges, Sudatel provided targeted funding and logistics to restore key functional areas of the center.



The National University of Sudan

The academic partnership between National University-Sudan (NUSU) and the Mycetoma Research Center (MRC) represents a vital national alliance that significantly boosts Sudan's scientific capacity to combat mycetoma through shared infrastructure and expertise. By granting MRC researchers access to NUSU's state-of-the-art laboratories, including advanced molecular diagnostics and drug-screening facilities, this collaboration overcomes resource constraints, accelerates species identification, and optimises research costs. Furthermore, by uniting university faculties with frontline clinical experts and providing hands-on thesis opportunities for postgraduate students, the partnership fosters a resilient pipeline of local scientific talent and interdisciplinary research. Ultimately, this home-grown synergy ensures that cutting-edge bench science directly translates into improved diagnostic accuracy and better clinical outcomes for vulnerable endemic communities.



Operational Support and Clinical Impact of MSF Surgical Consumables Donation

The generous donation of surgical and medical consumables from Médecins Sans Frontières (MSF / Doctors Without Borders) provided a vital lifeline for the Mycetoma Research Center (MRC) and its decentralised operational model. By equipping outpatient clinics in Kassala and Khartoum, MSF's intervention directly restored clinical capacity and ensured continuous care for hundreds of socio-economically vulnerable patients during a period of acute national crisis.



Conferences and Symposia

The 95th Annual Meeting of the Japanese Society for Infectious Diseases



Mrs Lubna Elnour, an MRC Research Assistant, represented the Mycetoma Research Centre at the 95th Annual Meeting of the Japanese Society for Infectious Diseases in November 2025. During the forum, she presented her latest research on the clinical effectiveness of Photodynamic Therapy (PDT) for mycetoma management, highlighting how this innovative, light-activated treatment selectively destroys pathogens and reduces lesion size without causing systemic toxicity or fueling drug resistance. Her presentation provided global experts with vital clinical data on non-antibiotic alternatives for low-resource settings. Beyond her session, Mrs Elnour engaged with international infectious disease specialists, reinforcing the MRC's academic continuity during its reconstruction period and laying the foundations for future collaborative research partnerships between Japanese institutions and the MRC.

The 22nd International Society for Human Mycology (ISHAM)

Our Research Assistant, Dr Rawa Badri, participated in the 22nd ISHAM Conference, held from 20 to 24 May 2025 in Brazil. Representing the Mycetoma Research Centre, Dr Badri successfully delivered a poster presentation on her research, engaging with the global medical mycology community.





Dr. Fabiana Alves
NTD Leishmaniasis -
Mycetoma Cluster Director



Dr. Borna Nyaoke-Anoke
Head, The Mycetoma
Programme, DNDi

Mycetoma Ambassadors 2025

In 2025, the Mycetoma Research Centre Scientific Committee proudly announced the appointment of Dr Fabiana Alves, Director of the NTD Leishmaniasis–Mycetoma Cluster, and Dr Borna Nyaoke-Anoke, Head of the Mycetoma Programme at DNDi, as our distinguished global health Ambassadors.

As we reflect on a year profoundly defined by the physical and operational rehabilitation of our Centre, we extend our deepest commendation to these leaders for their unwavering dedication. Their strategic leadership served as an essential inspiration of hope, ensuring that despite the immense challenges of the Sudan conflict and patient displacement, the voices of those suffering from mycetoma were never silenced. Throughout their tenure, Dr Alves and Dr Nyaoke-Anoke exemplified a passionate commitment to the “neglected of the neglected” by championing mycetoma on national and global health agendas, keeping the disease a priority for governments, stakeholders, and non-governmental organisations alike.

Furthermore, their efforts were instrumental in bridging the critical gap between affected populations and frontline healthcare networks, fostering deep community solidarity while actively dismantling the social stigma associated with the condition. By continuously highlighting the urgent clinical need for early diagnostics and optimised therapeutic options, they successfully mobilised international resources. They motivated a global movement to address the severe socio-economic barriers faced by patients.

These Mycetoma Ambassadors embody the true, transformative spirit of medical advocacy. Their proactive involvement in global awareness campaigns and localised educational initiatives has made a tangible, life-saving difference across vulnerable communities. In celebrating these milestones, the MRC reaffirms its collective commitment to supporting our Ambassadors and expanding the international reach of their initiatives. Together, through a powerful combination of shared scientific expertise and unyielding institutional resolve, we continue to forge ahead toward a future where mycetoma is no longer a neglected public health burden. Still, a challenge decisively met, addressed, and conquered.

Enhancing Clinical Services and Patient Care

In 2025, the Mycetoma Research Centre significantly advanced its clinical services and patient care by expanding its geographic reach from Kassala to include eastern Sudan, Ethiopia, and Eritrea. This regional expansion was further strengthened by targeted mobile field clinics operating directly within isolated villages across the New Halfa locality in eastern Sudan. Simultaneously, the centre achieved a major milestone in institutional continuity as the primary mycetoma clinic at the Khartoum headquarters officially reopened its doors to welcome and manage patients. A total of 600 patients were seen at the clinic, and 60 surgical operations were performed.



The Mycetoma Clinic at Kassala Mycetoma Satellite Centre

To enhance this dual-front healthcare delivery, the centre launched a landmark Early Access Cohort Study for Fosravuconazole in August to evaluate the oral therapeutic's real-world effectiveness across a larger patient population. Rather than acting solely as a pharmaceutical trial, the integration of this protocol has served as a catalyst for enhanced clinical excellence, fundamentally improving the quality of precision diagnostics, specialised medical therapies, and integrated, tissue-sparing surgical care for mycetoma patients throughout the region..



The Mycetoma Clinic at Kassala Mycetoma Satellite Centre

Strengthening Regional Health Infrastructure Through Specialised Medical and Clinical Laboratory Training

The implementation of this clinical study served as a powerful engine for local capacity building, successfully training a substantial cohort of frontline medical and healthcare professionals in Good Clinical Practice (GCP), Good Clinical Laboratory Practice (GCLP), Pharmacovigilance, and Drug Safety, in collaboration with the DNDi. By aligning regional workflows with these strict international scientific and ethical standards, the initiative guaranteed uncompromised patient safety and data integrity while systematically elevating the baseline of medical delivery across Eastern Sudan.

A central milestone of this educational framework was the intensive training of laboratory staff in advanced molecular diagnostic techniques. Traditional diagnostic methods often struggle to differentiate between the diverse fungal and bacterial species that cause mycetoma, leading to broad-spectrum, imprecise treatment plans. Through this specialised training, healthcare workers mastered cutting-edge tools such as polymerase chain reaction (PCR) assays and genetic sequencing technologies, enabling them to achieve precise pathogen identification at the species level.



The Mycetoma Diagnostics Training Workshop at Kassala

This shift to species-level diagnostics allows for the design of highly targeted, patient-specific therapeutic regimens, drastically reducing the trial-and-error prescribing patterns that often exacerbate drug resistance and systemic toxicity. Ultimately, by embedding these sophisticated clinical protocols and molecular capabilities into the local workforce, the project has permanently strengthened the regional healthcare architecture. It leaves behind a resilient, highly skilled network of professionals equipped to deliver world-class diagnostic and clinical excellence long after the immediate study concludes.



Mycetoma PCR diagnosis technique

Capacity Building, Education, and Training

Alongside recognition for pioneering research and innovative treatments, the Mycetoma Research Centre is committed to building staff capacity, education, and training to ensure sustainable progress in the fight against mycetoma and other neglected tropical diseases.

Our multidisciplinary staff continuously engage in professional development activities, participate in specialised training programmes, stay up to date with the latest clinical protocols, and collaborate on research initiatives to enhance patient care and treatment outcomes. Below are some of our staff capacity-building activities.

Early Career Researchers Academy

Three researchers from our team, Dr Samira Mohammed, Dr Eman Kheir, and Dr Ali Awadalla, joined the Early Career Researchers Academy, organised by Clarivate in collaboration with the Egyptian Knowledge Bank. The academy lasted six months and comprised seven programmes and 21 modules, covering topics in scientific research, publication ethics, and academic-industry collaborations.

Program Name	Module Name	Date	Timing	Notes
Write a Manuscript	Choose the journal	Monday, April 28, 2025	6:00 PM - 8:30 PM	Summer time, Cairo will be GMT + 3
	Scientific writing techniques			
	Write a compelling manuscript	Wednesday, April 30, 2025	6:00 PM - 8:30 PM	
Write a Funding Proposal	Reflection			
	Allocate the funder	Monday, May 5, 2025	6:00 PM - 8:30 PM	
	Guidelines for grant proposals	Wednesday, May 7, 2025	6:00 PM - 8:30 PM	
Become a Peer Reviewer	Write a compelling grant proposal			
	Reflection			
	Position yourself as a reviewer	Monday, May 19, 2025	6:00 PM - 8:30 PM	
	Editorial expectations & research integrity			
	Writing your peer review report	Wednesday, May 21, 2025	6:00 PM - 8:30 PM	
	Reflection			
Assignment 1 - Monday, May 26, 2025				
Higher Education Teaching Skills	Academic presentations	Monday, September 1, 2025	6:00 PM - 8:30 PM	
	Enhance your teaching/learning skills			
	Define syllables for academic courses	Wednesday, September 3, 2025	6:00 PM - 8:30 PM	
Collaborate with Industry	Reflection			
	Position yourself as an industry collaborator	Monday, September 15, 2025	6:00 PM - 8:30 PM	
	Manage research projects with industry	Wednesday, September 17, 2025	6:00 PM - 8:30 PM	
Research Communication Skills	Get funding from industry			
	Reflection			
	Present scientific findings	Monday, October 13, 2025	6:00 PM - 8:30 PM	
Academic and Research Collaborations	Build a smart research profile			
	Write conference proceedings	Wednesday, October 15, 2025	6:00 PM - 8:30 PM	
	Reflection			
	Position yourself as domain expert	Monday, October 20, 2025	6:00 PM - 8:30 PM	
	Guidelines to research positions applications			
	Collaborate with international researchers	Wednesday, October 22, 2025	6:00 PM - 8:30 PM	
Assignment 2 - Thursday, October 23, 2025				
Onsite Award Ceremony Wednesday, November 12, 2025 (Tentative Date)				



Advancing Mycological Biobanking: Specialised Capacity Building at Chiba University

In alignment with the Mycetoma Research Centre's commitment to continuous professional development and the preservation of critical biological resources, Research Assistant Mrs Lubna Elnour completed an advanced scientific training programme at the Medical Mycology Research Center (MMRC) at Chiba University, Japan. As a premier global authority in fungal pathogenesis and a vital institutional partner, Chiba University provided an elite repository of expertise to enhance the MRC's diagnostic and archival capabilities.



The primary objective of this intensive training was to master next-generation methodologies in fungal culture preservation, institutional biobanking, and digital repository documentation. Through hands-on laboratory instruction and collaborative exchange with leading Japanese mycologists, Mrs Elnour expanded her technical portfolio across three core operational pillars: Advanced Culture Preservation Techniques: Training focused on optimising long-term viability protocols for fastidious and slow-growing fungal pathogens like *Madurella mycetomatis*. This included mastering precision cryopreservation (ultra-low-temperature freezing at -80°C and within liquid nitrogen vapour phase) and lyophilisation (freeze-drying). These techniques prevent genetic drift, morphological alterations, and loss of virulence in stored strains over the course of decades.



Medical Mycology Research Center at Chiba University, Japan.

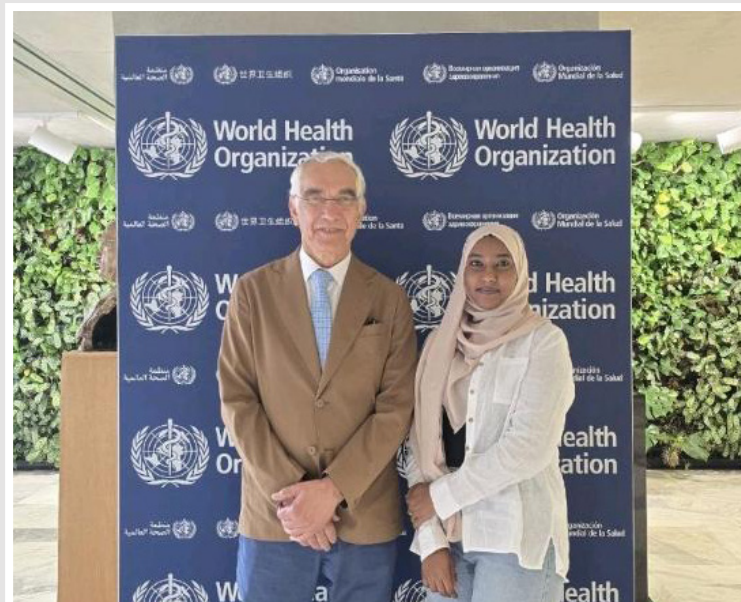
Modern Biobanking Infrastructure: Mrs Elnour studied the structural and biosafety frameworks required to maintain a world-class mycological biobank. This included strict quality control standards, temperature-monitoring redundancy, and risk-mitigation protocols to safeguard irreplaceable clinical isolates against infrastructure failure or environmental stress.

Rigorous Digital Documentation and Curation: A critical component of the training was dedicated to modern data management. Mrs Elnour gained proficiency in comprehensive biobank indexing systems, ensuring that every clinical sample is meticulously linked to its corresponding phenotypic data, molecular profiles, geographic origin, and patient clinical histories.

By translating these world-class standards back to the MRC, this training significantly advances our institutional capacity to maintain an uncompromised, legally compliant biobank. These newly acquired skills directly empower the MRC to preserve invaluable regional strains, streamline cross-border collaborative research, and provide a verified, high-integrity foundational library for future diagnostic and drug discovery pipelines.

WHO Educational Visit

Dr Rawa Badri joined an educational visit to the World Health Organisation (WHO) Headquarters. During the visit, Dr Badri gained experience across a wide range of areas, including antimicrobial resistance, neglected tropical diseases, and health workers in conflict settings.



Institutional Capacity Building in 2025

Throughout 2025, the Mycetoma Research Centre reinforced its commitment to academic excellence and professional development. Leveraging the extensive expertise of our staff, the Centre organised and delivered a comprehensive series of presentations, webinars, lectures and specialised training workshops. These initiatives were designed to bridge the gap between research and clinical practice, providing healthcare professionals and researchers with the latest evidence-based insights into mycetoma management and medical education.

The following sections detail the specific educational programmes conducted throughout the year:

Executive Research Capacity Building: A Collaborative Methodology Initiative

In a strategic partnership with the Centre for Professional Development (CPD) at the National University-Sudan, a comprehensive year-long series of advanced lectures and workshops on research methodology was successfully delivered. Under the leadership of Professor Fahal, this joint initiative was meticulously designed to fortify the national institutional research ecosystem and elevate the quality of biomedical literature. The training curriculum focused heavily on equipping participants with the foundational frameworks and sophisticated analytical tools needed to design, conduct, and publish high-impact scientific inquiry on the international stage.



The seminar series engaged a diverse and multidisciplinary cohort of academic professionals. Senior researchers attended to refine their existing methodological approaches, optimise their study designs, and integrate advanced biostatistical controls into their current protocols. Concurrently, the workshops provided early-career researchers and postgraduate students with a rigorous environment to develop core research competencies, including literature synthesis, ethical human-subject protocols, grant writing, and manuscript construction. Beyond serving as a vehicle for academic skill acquisition, these workshops acted as a vital intellectual hub and networking platform. By cultivating an interactive, collaborative environment among attendees, the sessions successfully incentivised cross-disciplinary partnerships. This synergy has bridged various scientific domains, directly resulting in several active, ongoing joint research initiatives that continue to strengthen academic cohesion across participating institutions.

National Capacity Building: High-Level Technical Proposal Writing Workshop in Port Sudan



In a significant initiative to bolster Sudan's research capacity building, a high-level, three-day workshop on Technical Proposal Writing was convened at the National University–Sudan in Port Sudan. The intensive programme was led by Prof. Fahal, Director of the Mycetoma Research Centre, Prof. Marmar A. El Siddig, University of Khartoum, and Dr Ali Awadallah Saeed, the National University, Sudan. This workshop was the direct result of a strategic, multilateral collaboration between the Ministry of Higher Education and Scientific Research, the Federation of Arab Scientific Research Councils (FASRC), the UNESCO Khartoum Office, and the National University of Sudan..

The opening session featured a pivotal keynote address by Professor Ahmed Mudawi Musa, the Minister of Higher Education and Scientific Research, who emphasised that scientific research is the fundamental cornerstone of national development and capacity building. The Minister highlighted the urgent need to equip the nation's researchers with the competencies to design competitive, high-impact proposals. Such skills are considered essential for addressing critical socio-economic challenges and for contributing to the sustainable reconstruction of the nation.n.

Designed to foster a culture of research excellence and international competitiveness, the workshop targeted several core institutional milestones. Faculty members focused heavily on competitive design, equipping researchers with the necessary structural and strategic tools to meet the rigorous standards and funding criteria of international grant-awarding bodies. Additionally, the workshop maintained a strict problem-solving focus, ensuring that participant research objectives were closely aligned with national reconstruction and long-term sustainability goals.

Beyond immediate skill acquisition, the forum acted as a powerful vehicle for building collaborative networks, successfully strengthening the professional and academic ties between Sudanese higher education institutions and regional scientific councils. By equipping a new cohort of researchers with these vital competencies, the Mycetoma Research Centre and its strategic partners continue to actively drive academic resilience, scientific progress, and sustainable development within Sudan and the wider Arab scientific community.

Regional Academic Empowerment: Scientific Proposal Writing Workshop at the University of Kassala

Continuing the vital mission to enhance national research standards, a high-level, three-day workshop on Scientific Proposal Writing was conducted at the University of Kassala. The intensive programme was led by Professor Fahal, Director of the Mycetoma Research Centre, who provided regional researchers with rigorous, practical guidance on developing impactful and highly competitive research frameworks. This capacity-building initiative was organised in close collaboration with the Federation of Arab Scientific Research Councils (FASRC), forming a core component of a sustained strategic effort to decentralise academic and research excellence across Sudan's regional universities.

The methodology of the sessions was specifically designed to bridge the operational gap between academic theory and successful international grant acquisition. Key focus areas centred on advanced proposal development, where participants refined the structural, methodological, and technical components of their scientific protocols to meet the stringent criteria of global funding bodies. Additionally, the workshop emphasised scientific communication, enhancing the structural clarity, precision, and persuasiveness of research narratives to better articulate potential clinical and socio-economic impacts. This targeted training ultimately served as a vehicle for sustainable institutional capacity building, deeply strengthening the baseline research culture within the University of Kassala and its surrounding academic community.



The event was characterised by exceptional levels of active participation, resulting in sophisticated technical discussions among attendees. The profound engagement from the faculty and researchers at the University of Kassala highlights a shared institutional commitment to advancing localised research quality and scientific integrity. By continuously fostering these vital regional collaborations, the Mycetoma Research Centre, Kassala University and the FASRC are successfully building a robust, resilient, and interconnected scientific community equipped to address complex local health challenges and drive national development.



Molecular Diagnostics of Mycetoma Workshop

Prof. Abdallah Osman Ahmed, Head of the Laboratory at the Mycetoma Research Centre, conducted a specialised workshop on the molecular diagnosis of mycetoma at Kassala University. The workshop aimed to enhance the capacity of laboratory personnel in accurately identifying mycetoma-causing organisms using advanced molecular techniques. The workshop covered key topics including DNA extraction, polymerase chain reaction (PCR) amplification, gel electrophoresis, sequence analysis, and interpretation of molecular results for both bacterial and fungal causes of mycetoma. Emphasis was placed on distinguishing between actinomycetoma and eumycetoma, which is critical for guiding appropriate treatment.



Through a combination of theoretical lectures and hands-on practical sessions, participants gained proficiency in diagnosing mycetoma using molecular methods. Pre- and post-workshop assessments demonstrated a significant improvement in participants' knowledge and technical skills.

As a result of this training, the MRC has strengthened its diagnostic capacity, reduced turnaround times for species identification, and improved the accuracy of mycetoma case confirmation. This workshop represents an important step toward standardising molecular diagnostics for mycetoma in Sudan and the region.

Advancing Regional Diagnostics: High-Level Mycetoma Ultrasound Training in Ethiopia

In a significant milestone for regional and South-South collaboration, the Mycetoma Research Centre, in partnership with the Drugs for Neglected Diseases initiative (DNDi) and the Faculty of Medicine at Arba Minch University, conducted a high-level ultrasound training workshop in Ethiopia. This strategic initiative focused on enhancing regional diagnostic capacity for mycetoma through advanced, non-invasive imaging techniques, reinforcing a collective commitment to tackling neglected tropical diseases (NTDs)



across East Africa.

The intensive training was hosted at the Amhara Regional State (ANRS), Boru Meda General Hospital in Dessie. Dr Mustafa Elnour Bahar, Consultant Radiologist at the MRC, led the comprehensive, hands-on instructional sessions. His work focused on equipping Ethiopian radiologists and dermatologists with specialised ultrasound diagnostic skills, successfully bridging the gap between historical medical ties and modern clinical practice in the Horn of Africa.



Under the guidance of Dr Bahar, the mission provided critical diagnostic services while gathering essential epidemiological metrics. Throughout the deployment, thirty-five patients underwent comprehensive clinical and radiographic evaluations, resulting in the definitive confirmation of thirty-three mycetoma cases via specialised ultrasound protocols. Crucially, the epidemiological insights gathered revealed that the vast majority of these patients originated from the Afar region. This area shares distinct arid environmental characteristics with the «Mycetoma Belt» of Sudan, a finding that strongly underscores the need for trans-border medical cooperation, synchronised surveillance, and shared diagnostic standards.



This three-day intensive programme successfully synthesised core theoretical foundations with direct, bedside diagnostic sessions. Under Dr Bahar's expert instruction, the Ethiopian participants demonstrated exceptional adeptness in operating ultrasound equipment and identifying the distinct acoustic «grain» signatures that serve as the definitive pathognomonic hallmark of mycetoma. By empowering local healthcare professionals with these highly specialised imaging skills, the joint mission has established a sustainable, long-term diagnostic capability in a heavily endemic region, ensuring early detection and preventing advanced disease progression.

The Mycetoma Research Club

Advancing Global Mentorship and Scientific Knowledge

The Mycetoma Research Club is a premier virtual forum that bridges the gap between emerging scientific talent and established global experts. By fostering a deep culture of mentorship and high-level knowledge exchange, the Club unites a diverse ecosystem of postgraduate students, junior researchers, and senior clinicians worldwide, all dedicated to advancing the clinical and scientific management of mycetoma.

The strategic objectives of this digital collective are anchored in knowledge incubation, mentorship, and interdisciplinary problem-solving. As an incubator for scientific thought, the Club provides an agile platform for the dissemination of preliminary research data, innovative methodologies, and frontline clinical breakthroughs. Concurrently, it offers structured guidance, academic peer review, and professional support to the next generation of mycetoma scientists. By encouraging collaborative, cross-disciplinary approaches, the forum equips members with the diverse perspectives needed to navigate the complex diagnostic, surgical, and therapeutic challenges posed by this neglected tropical disease.

The year 2025 marked a period of exceptional milestones and international highlights for the initiative. The Club successfully convened six high-impact virtual sessions via Zoom, attracting a large global audience of researchers and medical professionals spanning multiple continents. The carefully curated curriculum tackled critical thematic areas at the forefront of modern medicine. Discussions on clinical challenges focused heavily on navigating the complexities of long-term antifungal therapy and patient compliance. Global policy sessions provided a thorough analysis of the World Health Organization (WHO) Fungal Priority Pathogens List, evaluating mycetoma's unique standing within global health agendas. Additionally, sessions dedicated to future frontiers explored highly innovative territories, including the integration of Artificial Intelligence (AI) in diagnostic research, the revolutionary potential of nanomedicine in targeted drug delivery, and strategic pathways for navigating Horizon Europe to secure international funding.

This robust framework was brought to life by an elite roster of distinguished faculty and guest speakers drawing from prestigious institutions, including the Drugs for Neglected Diseases initiative (DNDi), the World Health Organization, and leading universities across the United Kingdom and Europe. To ensure lasting educational impact and universal accessibility, all proceedings were meticulously recorded and archived in a dedicated, open-access playlist on the Mycetoma Research Centre's YouTube channel. These dynamic sessions have already served as a powerful catalyst for global health diplomacy, successfully opening doors to new multicenter studies, international collaborations, and cross-border research partnerships.



Mycetoma Research Club

Mycetoma Research Center is inviting you to a scheduled Zoom meeting:

Challenges of Long-Term Oral Therapy in Fungal Diseases: The Case of Chronic Pulmonary and Allergic Aspergillosis

Prof. David Denning
University of Manchester

Join Zoom Meeting:
<https://bit.ly/40K18gR>
Meeting ID: 843 6043 2506
Passcode: 787335
January 28, 2025
14:00 GMT+16:00 Sudan

مرکز أبحاث الميسيتوما
Mycetoma Research Centre

NANOMEDICINE FOR TREATMENT AND PREVENTION OF MYCETOMA DISEASE

Presented by: Rami Ahmed

22nd Mycetoma Research Club: Nanomedicine for Treatment and Prevention of Mycetoma Disease

Mycetoma Research Center Sudan
Published at 18/06/2025

The Mycetoma Research Club - June Session | Nanomedicine for the Treatment and Prevention of Mycetoma

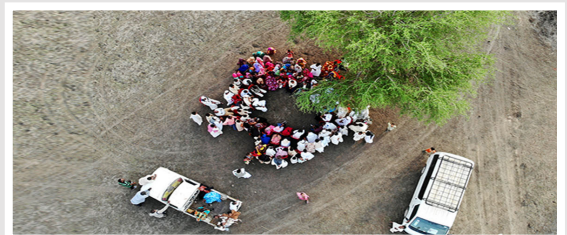
The MRC Research Groups

An Interdisciplinary Force

The MRC Research Groups are a constellation of specialised teams working in a synchronised, collaborative framework to address the multifaceted challenges of mycetoma. By integrating expertise in drug discovery, genomics, and artificial intelligence with social sciences and health systems research, the MRC ensures that scientific breakthroughs are translated into tangible clinical outcomes.

Health Systems Research Group

This group focuses on the “science of delivery.” Recognising the disruptions caused by recent regional challenges, this team investigates how to strengthen the healthcare infrastructure to ensure sustainable mycetoma care. They analyse patient pathways, healthcare financing, and the barriers to treatment adherence. By evaluating the integration of mycetoma care into primary healthcare settings, they aim to build a resilient health system that remains functional and accessible even in times of crisis.



Drug Discovery Research Group

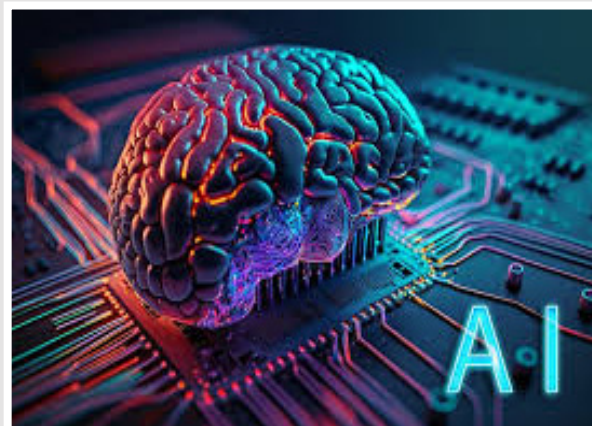
Dedicated to identifying and developing novel therapeutics, this group screens natural and synthetic compounds for anti-mycetoma activity. The team evaluates the efficacy and safety of potential drug candidates. Through strategic partnerships with pharmaceutical leaders and global research institutes, the group leverages shared resources to accelerate the delivery of innovative treatments that improve patient survival and quality of life.

Emerging Therapeutics: The imidazo[1,2-*b*]pyridazine scaffold as a novel drug candidate for eumycetoma, a neglected tropical disease

Lamis Yahia Mohamed Elkheir
Lecture – Faculty of Pharmacy, University of Khartoum
Research Assistant – Mycetoma research center

Artificial Intelligence (AI) Research Group

This group harnesses machine learning and advanced computational tools to revolutionise diagnostic accuracy and predictive care. By developing AI models that analyse imaging and clinical data, the team enables early diagnosis and the identification of subtle biomarkers. Their work extends to building predictive models for disease outbreaks and supporting telemedicine initiatives, ensuring that high-level expertise reaches underserved and remote populations through digital innovation.



Epidemiology Research Group

This group investigates the distribution and determinants of mycetoma within populations. By collecting and analysing field data, they identify environmental risk factors and map disease prevalence. Their community-based surveys and longitudinal studies provide the evidence base for national health policies, enabling targeted intervention programs and more effective control of disease transmission.



Bioinformatics Research Group

As the genomic backbone of the MRC, this group interprets the complex genetic data from both the host and the causative agents. Through high-throughput sequencing and comparative genomics, they identify pathogenicity factors and antimicrobial resistance markers. By maintaining a comprehensive genomic database and tracing the evolutionary lineage of fungal and bacterial strains, they facilitate global collaborative research, positioning the MRC at the forefront of precision medicine for NTDs.



Postgraduate Students

The Mycetoma Research Centre continues to actively support postgraduate students pursuing master's and doctoral degrees, offering mentorship, research opportunities and access to cutting-edge facilities. In addition, researchers and scientists at the MRC are engaged in innovative studies spanning epidemiology to drug development, contributing valuable insights to the global understanding of mycetoma.

Academic Degrees obtained

Dr Rawa Ali Hamad Badri

Master of Public Health (MPH), Imperial College London, UK

Dissertation title: Pharmaceutical and Surgical Interventions in the Management of Eumycetoma: a Scoping Review of Practices and Treatment Outcomes Using the IDDO Systematic Review



PhD in Progress

Dr Eiman Siddig Ahmed

In collaboration with the NIHR Global Health Research Unit on Neglected Tropical Diseases, Brighton and Sussex Medical School, UK

Thesis title: Wound Management and Socio-economic Impact

Mrs Rihab Ahmed Hassan

In collaboration with Erasmus Medical Centre, Rotterdam University, the Netherlands

Thesis title: In-vitro Susceptibility Pattern of Different Antimicrobial Classes Against Actinomycetoma and Eumycetoma.

Masters Degrees in Progress

Ms Nema Ahmed Alfaki

MSc in Infection Biology, Swiss Tropical and Public Health Institute, Basel, Switzerland

Dr Samira Mohammed

MSc in Clinical Pharmacy, University of Medical Sciences and Technology, Sudan

Dr Fadila Alhamawi

MSc in Public Health, University of Medical Sciences and Technology, Sudan

Dr Mohammed Elmontasir

MSc in Public Health, Al-Neelain University, Sudan

Mrs Lubna Sulayman Elnour

MSc in Tropical Medicine and Global Health, Nagasaki University, Japan

The Mycetoma Young Researchers Association (MYRA)

Cultivating the Next Generation

Established in 2022, the Mycetoma Young Researchers Association (MYRA) is a vibrant community of junior scientists, students, and emerging experts dedicated to closing critical knowledge gaps in Neglected Tropical Diseases (NTDs). In 2025, a year defined by rebuilding hope and restoring health, MYRA transitioned from a foundational group to a central pillar of the MRC's research ecosystem, fostering an environment where innovation and mentorship meet.

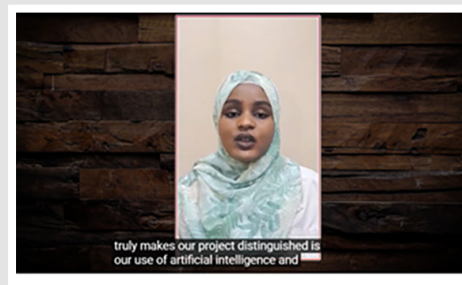


Many members of MYRA are actively pursuing postgraduate studies, including master's and doctoral degrees, with some having already successfully obtained their academic qualifications. Their dedication to academic rigour is evidenced by their consistent contributions to reputable international journals, bridging gaps in the literature and enhancing global understanding of mycetoma's epidemiology and clinical management. By integrating academic studies with practical laboratory and field experience, MYRA ensures that the next generation of experts is equipped with both theoretical depth and technical proficiency.

Synergy in Science: Drug Discovery Collaboration

https://mycetoma.edu.sd/?page_id=478

A hallmark of MYRA's success in 2025 has been the active engagement of its members, specifically undergraduate pharmacy students, with the Drug Discovery Research Group. This collaboration has allowed young researchers to participate in high-level scientific inquiry, focusing on the identification of novel molecular targets and the screening of new molecules as potential anti-mycetoma agents. By involving students in the early stages of drug development, MYRA is accelerating the search for effective therapies while providing students with invaluable hands-on experience in pharmaceutical research.



Global Visibility: The Global Mycetoma Working Group

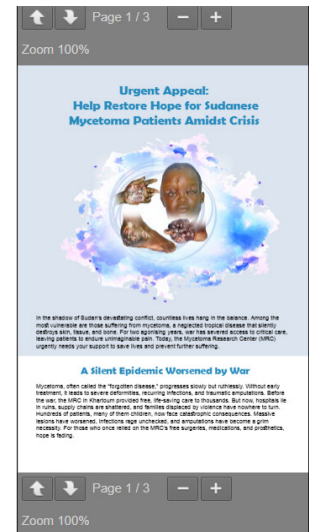
A defining milestone for the association was its participation in the Global Mycetoma Working Group (GMWG) in July 2025. This international forum provided a prestigious platform for our young researchers to represent the MRC on a global stage, highlighting the resilience of Sudanese researchers during the Centre's rehabilitation phase. Engaging with global health leaders ensured that MYRA's research priorities align with international NTD roadmaps and fostered networking opportunities for future international fellowships and multi-centre studies.

Communication and Outreach

Through platforms such as the Mycetoma Research Club and the Mycetoma Scientific Group, MYRA ensures its work reaches a broad audience, including researchers, clinicians, and policymakers. By facilitating community outreach and educational seminars, the association helps dispel misconceptions. It encourages early health-seeking behaviour in endemic regions, fostering a sense of hope and solidarity among affected populations.

- Animal cages rehabilitation
- Houses rehabilitation

Other projects



A Vision for the Future

MYRA's rapid growth reflects a burgeoning interest among the youth and academic institutions in addressing mycetoma as a global health priority. As the network continues to expand, it is poised to play an increasingly vital role in shaping future research directions, advocating for neglected populations, and ensuring sustained scientific progress in the fight against this debilitating disease.

Community Engagement and Public Health Outreach

Mycetoma Research Center World NTD Day Campaign: Art for Advocacy and Action

In observance of World NTD Day, the Mycetoma Research Center (MRC) launched a national creative advocacy campaign titled Call for Art Contributions. Guided by the overarching global theme, "Celebrating progress against NTDs and highlighting ongoing actions to end them," the initiative leverages artistic expression and visual storytelling to break down medical jargon, eliminate social stigma, and mobilise public action against Neglected Tropical Diseases across Sudan.

The initiative calls on a broad spectrum of creators, including visual artists, communicators, students, healthcare workers, media organisations, and civil society advocates, to develop culturally grounded media assets. Submissions encompass short video narratives, educational posters, infographics, photo series, political cartoons, and digital animations designed for wide dissemination across social platforms, local news outlets, and rural community health posts.



East Sennar Mycetoma Initiative

A high-impact clinical management and screening campaign was successfully delivered in Badi Village, East Sennar, marking a milestone in regional disease control. This initiative was made possible through a strategic partnership between the Sennar State Ministry of Health and Social Development (MOHSD), the Federal Mycetoma Control Programme Coordination Office, and the National Health Insurance Fund (NHIF).



Clinical and Logistical Outcomes

The mission achieved significant diagnostic and surgical milestones, providing life-altering care to the local community:

- **Diagnostic Excellence:** 56 clinical examinations were conducted, supported by 47 ultrasound scans to ensure precise case staging.
- **Case Identification:** 37 cases of mycetoma were confirmed, of which 25 were eumycetoma.
- **Surgical Intervention:** 23 urgent procedures have been fast-tracked for this month at Wad Taktouk 44 Hospital, including 6 critical paediatric cases.
- **Rehabilitative Care:** 10 patients requiring prosthetic support were identified. Through inter-agency coordination, the Zakat Chamber has committed the resources necessary to provide these essential devices.



The outpatient clinic at Badi village

Strategic Priorities for Sennar State

During the campaign, senior health officials reaffirmed the core pillars of the state's Mycetoma strategy:

- Early Detection: Prioritising early screening to improve patient outcomes and prevent long-term disability.
- Community Mobilisation: Strengthening local engagement to increase screening participation and adherence to medical advice.
- Environmental Prevention: Promoting the safe disposal of thorny vegetation to reduce the environmental presence of causal agents.

This coordinated mission serves as a model for multi-sectoral health initiatives. By aligning federal and state resources, the mission has significantly reduced the public health burden in East Sennar, ensuring specialised surgical and rehabilitative care reaches those most in need.



Local health authority staff during the campaign

The Wad Onsa Mycetoma Campaign

On 24 March 2025, a multi-sectoral mycetoma campaign was executed in Wad Onsa Village, representing a significant mobilisation of resources and expertise. The Mycetoma Control Programme, the Sennar State Ministry of Health, and the Mycetoma Research Centre jointly organised the mission. This collaborative effort was designed to address the clinical needs of the local population while reinforcing the political and structural frameworks required for long-term disease control.



Key Strategic Highlights

- **High-Level Political Commitment:** The Governor, Major General Al-Zubair Hassan Al-Sayed, reaffirmed that public health remains a primary state priority. Crucially, he pledged intensified support for the Wad Onsa Mycetoma Satellite Centre, a vital facility for decentralising specialised care.
- **Institutional Dedication:** The Minister of Health, Ibrahim Al-Awad Ahmed Abokamah, emphasised the Ministry's unwavering commitment to tackling neglected tropical diseases (NTDs) despite regional challenges.
- **Operational Expansion:** The Mycetoma Programme announced the expansion of mobile medical and surgical teams across affected states to ensure care reaches the most remote areas.
- **Public Health & Surveillance:** Plans were finalised for a comprehensive, statewide mycetoma survey that will focus on clinical data collection and increasing preventive awareness within at-risk communities.
- **Addressing the Impact of Conflict:** A significant portion of the mission was dedicated to assessing how treatment disruptions caused by the current conflict have exacerbated case severity—a critical concern for the Centre's clinical strategy.

Clinical Outcomes and Patient Care

The campaign provided essential diagnostic and therapeutic services to a high volume of patients:

- **Patient Assessment:** Over 90 individuals were clinically evaluated.
- **Epidemiological Insights:** 60% of those assessed were new cases, indicating a high level of previously unmet medical need.
- **Surgical & Rehabilitative Requirements:** A significant number of patients were identified for urgent surgical intervention and prosthetic support.

The success of this mission was made possible through the dedicated support of our partners. We extend our gratitude to the Sudanese Red Crescent, the Bankir Organisation, and all local stakeholders whose contributions were vital to the delivery of these essential health services.



Wad onsa village mycetoma campaign

Standing Together Against All Odds: A Heartfelt Acknowledgement

The year 2025 marked one of the most testing periods in the history of the Mycetoma Research Center. Confronted with unprecedented structural destruction, severe operational disruptions, and the immense human toll of regional conflict, the center's vital mission was pushed to the absolute brink.

Yet, even in the face of immense adversity, the MRC did not succumb to despair. Today, we stand resilient, rebuilding our facilities, restoring free clinical care, and resuming world-class research for the world's most vulnerable patients. This revival was only possible because of you.

Extending Our Deepest Gratitude

We extend our profound thanks and heartfelt appreciation to our global family of donors, international partners, corporate supporters, academic collaborators, and dedicated friends.

When the center was reduced to rubble, your swift compassion, unwavering solidarity, and generous contributions provided the life-sustaining foundation we needed to rise once again.

To Our Philanthropic & Corporate Donors: Your emergency funding and direct material contributions from essential surgical consumables and diagnostic reagents to solar power configurations and digital infrastructure realigned our emergency operations and restored clinical hubs in Khartoum, Kassala, Wad onsa and Badi villages and beyond.

To Our Academic & Global Health Partners: Your institutional solidarity ensured that our clinical data, collaborative research initiatives, and international exchange programmes remained active, keeping the global spotlight firmly on mycetoma and skin-NTDs.

To Our Friends & Community Advocates: Your moral support, grassroots fundraising, and relentless advocacy gave our team the courage, hope, and determination to continue serving impoverished communities when all odds were stacked against us.

Rising From the Rubble

«Rising from the rubble» is more than a metaphor for the MRC; it is a living reality. Every reopened clinic door, every sterile dressing applied, every diagnostic sample processed, and every limb saved is a direct reflection of your belief in our mission.

You proved that even in the darkest hours, humanity and scientific solidarity prevail over destruction. Because of your commitment during our most critical year, the Mycetoma Research Center continues to stand as a beacon of hope, health equity, and human dignity for thousands who have nowhere else to turn. From the bottom of our hearts, and on behalf of every patient whose life you have touched, **a big thank you.**



The Mycetoma Research Centre University of Khartoum

WHO Collaborating Centre on Mycetoma & Skin NTDs



www.mycetoma.edu.sd

