

BIOMEDICAL & VETERINARY SCIENCES

GRADUATE PROGRAM



ANNOUNCES

The Doctor of Philosophy Seminar and Examination of

Ehab Ali Salama

**“Developing novel combinations for treatment of
invasive fungal infections”**

Monday, December 11th, 2023

1:00PM

VMIA 220



Bio

Ehab Salama is a pharmacist who graduated from the school of pharmacy, Al-Azhar university, Egypt. He earned his master's degree in microbiology and immunology from Al-Azhar university. In 2018, Ehab started his journey to the USA as a visiting scholar at Purdue University where he later enrolled as a PhD student at Dr. Seleem's lab. In 2020, Ehab moved with the lab to Virginia Tech in Blacksburg to start a new phase of research into novel antimicrobial regimens. With the huge increase in the immunocompromised populations and dramatic development of drug resistance among pathogenic fungi, Ehab hopes to have an active contribution to the development of novel, safe and effective therapeutic regimens against serious fungal infections.

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VMCVM Office of Research and Graduate Studies

Lay Language Abstract

Fungi are a big group of organisms that interact with humans in many good and bad aspects. *Candida auris* is a fungus that represents a real threat to patients in the intensive care units. This fungus is characterized by its powerful spreading ability and its extraordinary resistance to most of the known antifungal agents making most of the antifungal agents out of service. In the current work we identified several drugs that can work to restore the activity of these traditional antifungal agents. We identified 4 main drugs with high ability to make the antifungal drugs work again against the deadly fungus. Moreover, we identified the mechanism by which these drugs could restore the activity of the antifungal agents. We also confirmed the effectiveness of these combinations in animal models.

Publications

- E. Salama, H. Eldesouky, Y. Elgammal, N. Abutaleb, M. N. Seleem. (2023). Lopinavir and ritonavir act synergistically with azoles against *Candida auris* in vitro and in a mouse model of disseminated candidiasis (Published in International Journal of Antimicrobial Agents, 62 (2023) 106906). IF=15.
- Y. Elgammal, E. Salama, M. N. Seleem. (2023). Y. Elgammal, E. Salama, M. N. Seleem. (2023). Saquinavir potentiates itraconazole's antifungal activity against multidrug-resistant *Candida auris* in vitro and in vivo. Antimicrobial Agents and Chemotherapy 67 (5), e01631-22. .IF=5.6
- Y. Elgammal, E. Salama, M. N. Seleem. (2023). Saquinavir potentiates itraconazole's antifungal activity against multidrug-resistant *Candida auris* in vitro and in vivo. Medical Mycology 61 (9), myad081.
- Ehab A. Salama, Yehia Elgammal, Aruna Wijeratne, Nadia A. Lanman, Utturkar S. M, Atena Farhangian, Jianing Li, Brigitte Meunier, Tony R. Hazbun, and M. N. Seleem. (2023). Lansoprazole interferes with fungal respiration and acts synergistically with amphotericin B against multidrug-resistant *Candida auris* (Submitted to Cell Report Medicine, CR-MEDICINE-D-23-02395). IF=14.
- Hagras, M., Salama, E.A., Sayed, A.M, M. N. Seleem & A. Mayhoub. (2020). Oxadiazolylthiazoles as novel and selective antifungal agents. European Journal of Medicinal Chemistry 189 (2020) 112046 IF= 7.08. PMID: 31962263.
- Al-Trawneh, N. Abutaleb, E. Salama, A. Tarawneh, and M. N. Seleem. (2020). Synthesis of new pyrazolo[5,1-c][1,2,4]triazines with antifungal and antibiofilm activities. Chemical Papers volume 74, pages1241–1252(2020). IF 2.09
- H. E. Eldesouky, E. A. Salama, N. A. Lanman, T. R. Hazbun, M.N. Seleem. (2021). Potent Synergistic Interactions between Lopinavir and Azole Antifungal Drugs against Emerging Multidrug-Resistant *Candida auris*. Antimicrobial Agents and Chemotherapy. 2021:65:1 IF= 5.9.
- M. Hagras, N. S. Abutaleb, A. M Sayed, E. A. Salama, M N Seleem, A. Mayhoub. (2021). Evaluation of bisphenylthiazoles as a promising class for combating multidrug-resistant fungal infections. Plos one e0258465 IF= 3.78
- H. Oliveira, R. Castelli, L. Alves, J. Nosanchuk, E. Salama, M. N. Seleem, M. Rodrigues. (2022). Identification of 4 compounds from the Pharmakon library with antifungal activity against *Candida auris* and species of *Cryptococcus*. Medical Mycology. 2022. 60. myac033. IF= 3.74.

Publications continued

M. Zhang, P.Dong, H. Eldesouky, Y. Zhan,; H. Lin, Z. Wang, E. Salama, S. Jusurf, C. Zong, Z. Chen,; M. N. Seleem, J. Cheng. (2023). Fingerprint SRS Imaging Unveils Ergosterol Ester as a Metabolic Signature of Azole-Resistant *Candida albicans*. *Analytical Chemistry*. ac-2023-00900u IF= 8.00.

M. Hagra, N. S. Abutaleb, H. G. Ezzat, E. A. Salama, M. N. Seleem and Abdelrahman S. Mayhoub. (2023). Naphthylthiazoles: Broad Spectrum Class of Antifungals. *RSC Med. Chem.*, 2023, DOI:10.1039/D3MD00323J.

H. Eldesouky, E. Salam, T. Hazbun, A. Mayhoub & M. N. Seleem. (2020). Ospemifene displays broad-spectrum synergistic interactions with itraconazole through potent interference with fungal efflux activities. *Scientific reports* 10 (6089) IF= 4.99. PMID: 32269301.

H. Eldesouky, E. Salama, L. Xiaoyan, H. Mohammad, T. Hazbun, A. Mayhoub & M. N. Seleem. (2020). Repurposing approach identifies pitavastatin as a potent azole chemosensitizing agent effective against azole-resistant *Candida* species. *Scientific Reports* 10 (1), 1-12 IF= 4.99. PMID: 32372011.

Presentations

Ehab A. Salama, Yehia Elgammal, Aruna Wijeratne, Mohamed N. Seleem. (2023). A novel combination of amphotericin b and lansoprazole to combat the fungal superbug Candida auris, targeting the mitochondrial cytochrome bc1 complex. VCOM Research Recognition Day, February 24th, Blacksburg, VA.

Ehab A. Salama, Yehia Elgammal, Aruna Wijeratne, Mohamed N. Seleem. (2023). Lansoprazole potentiates the antifungal activity of amphotericin B against multi-drug resistant Candida auris, targeting the cytochrome bc1 complex. VTCDD symposium, April 14th, 2023, Blacksburg, VA

Ehab A. Salama, Yehia Elgammal, Aruna Wijeratne, Mohamed N. Seleem. (2023). Lansoprazole potentiates the antifungal activity of amphotericin B against multi-drug resistant Candida auris, targeting the cytochrome bc1 complex. 32nd Annual BMVS Graduate Research Symposium, March 14th, 2023, Blacksburg, VA.

Ehab A. Salama, Yehia Elgammal, Aruna Wijeratne, Nadia A. Lanman, Sagar M. Utturkar, Atena Farhangian, Jianing Li, Brigitte Meunier, Tony R. Hazbun, Mohamed N. Seleem. (2023) Lansoprazole interferes with fungal respiration and acts synergistically with amphotericin B against multidrug-resistant Candida auris. 2023 CeZAP Infectious Diseases Symposium, October 6th, 2023, Blacksburg, VA.

Academic Awards and Achievements

Ehab A. Salama, Yehia Elgammal, Aruna Wijeratne, Mohamed N. Seleem. (2023). Lansoprazole potentiates the antifungal activity of amphotericin Bz against multi-drug resistant Candida auris, targeting the cytochrome bc1z complex. 32nd Annual BMVS Graduate Research Symposium, March 14th,z 2023, Blacksburg, VA.

Best poster presentation Award

Examination Graduate Committee

Major Advisor/Chair:

Mohamed Seleem DVM, MS, PhD
Professor
Department of Biomedical Sciences and Pathobiology
VA-MD College of Veterinary Medicine
Virginia Tech

Graduate Advising Committee Members:

Clayton Caswell, PhD
Associate Professor
Department of Biomedical Sciences and Pathobiology
VA-MD College of Veterinary Medicine
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Pablo Sobrado, PhD
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