

Nationality: Egyptian Birth date: April 6, 1966

Birth place: Alexandria, Egypt

Marital Status: Married

- Professor of Microbiology and Immunology
- Dean of the Faculty of Pharmacy
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Education

•	2000	Ph.D. in Pharmaceutical Sciences, Department of Pharmaceutical
		Microbiology, Faculty of Pharmacy, Alexandria University, EGYPT.
•	1995	Master in Pharmaceutical Sciences, Department of Pharmaceutical
		Microbiology, Faculty of Pharmacy, Alexandria University, EGYPT.
•	1989	Bachelor in Pharmaceutical Sciences, Distinction of Honor, Faculty of
		Pharmacy, Alexandria University, EGYPT.
•	1984	Graduated at the Sacred Heart English School, Alexandria, Egypt.

Research Experiences

- 1/2000 Present Post-doctoral researcher, Department of Microbiology and Immunology, Faculty of Pharmacy, Alexandria University, Egypt.
- **2000 Present** Scientific Supervisor of 14 Master and 4 Ph.D. theses in the Faculty of Pharmacy, Faculty of Medicine, Faculty of Dentistry, Research Centers District New Borg El-Arab City, Pharco Pharmaceuticals.
- External examiner for many MSc and PhD theses in the Faculties of Pharmacies, Faculty of Medicine and Institute of Graduate Studies and Research.
- 7/1996 1/2000 Full-time PhD student, Department of Pharmaceutical Microbiology, Faculty of Pharmacy, University of Alexandria, Egypt. Thesis entitled: "Comparative studies on the bacterial resistance of local isolates to some third and fourth generation cephalosporins".

- **1990-1995** Full-time MSc student, Department of Pharmaceutical Microbiology, Faculty of Pharmacy, University of Alexandria, Egypt. Thesis entitled: "Microbiological study to maximize the activity of aztreonam".
- 1990-1995 Intensive practical and theoretical postgraduate courses of Pharmaceutical Microbiology, Molecular biology, Antibiotics, Microbiological quality control, Faculty of Pharmacy, University of Alexandria.
- 1990-1991 Intensive postgraduate courses of computer, mathematics and statistics, physics and advanced instrumental analysis, Faculty of Pharmacy, University of Alexandria.

Academic Employment

- 11/2020 Present Dean of the Faculty of Pharmacy, Alexandria University.
- 12/2017 11/2020 Vice dean for Community Service Affairs and Environmental Development, Faculty of Pharmacy, Alexandria University.
- 08/2017 12/2017 Executive Manager for Pharmaceutical Science Park, Faculty of Pharmacy, Alexandria University.
- 6/2016 Present Professor of Microbiology and Immunology, Faculty of Pharmacy, Alexandria University.
- 9/2009 4/2016 Associate Professor of Pharmaceutical Microbiology, Faculty of Pharmacy, Alexandria University.
- 9/2009 12/2017 Academic Advisor for Undergraduate students, Clinical Pharmacy Program, Faculty of Pharmacy, Alexandria University.
- 9/2010 12/2017 Coordinator and Academic advisor- postgraduate students M.Sci and Ph.D. for Pharmaceutical Microbiology, Faculty of Pharmacy, Alexandria University.
- 6/2004 Present Tutor and co-Supervisor of master and Ph.D. students at the department of Pharmaceutical Microbiology, Faculty of Pharmacy, Alexandria University.
- **2000 2009** Assistant Professor of Pharmaceutical Microbiology, Faculty of Pharmacy, Alexandria University.
- **1995 2000** Assistant Lecturer of Pharmaceutical Microbiology, Faculty of Pharmacy, Alexandria University.
- 1989- 1995 Demonstrator (teaching assistant) of Pharmaceutical Microbiology, Faculty of Pharmacy, Alexandria University.
- 2/1993 2/1994 Working as volunteer in an ophthalmology microbiology lab, Francis I. Proctor Foundation, UCSF (University of California San Francisco), San Francisco, California, USA.

Teaching experience

- Undergraduate Lectures in General Microbiology.
- Undergraduate Lectures in Microbial Genetics.
- Undergraduate Lectures in Microbial Contamination and Quality Control.
- Undergraduate Lectures in Antiseptics and Disinfectants.
- Undergraduate Lectures in Sterilization and sterility testing.
- Postgraduate courses in Advanced Pharmaceutical Microbiology, Faculty of Pharmacy, Alexandria University.
- Postgraduate courses in Advanced General Microbiology, Faculty of Pharmacy, Alexandria University.
- Postgraduate courses in Advanced Molecular Biology, Faculty of Pharmacy, Alexandria University.
- Supervisor of practical undergraduate courses of Pharmaceutical Microbiology, Faculty of Pharmacy, Alexandria University.

Managerial and Professional Experiences

- Dean of the Faculty of Pharmacy, Alexandria University.
- Vice dean for Community Service Affairs and Environmental Development, Faculty of Pharmacy, Alexandria University.
- Executive Manager for Pharmaceutical Science Park, Faculty of Pharmacy, Alexandria University.
- President of the "International Conference and Exhibition on Pharmaceutical and Healthcare Sciences" PHS 2022 – Egypt vision for Healthcare 2030; 23-24 November 2022 Hilton Green Plaza, Alexandria.
- Chairman of the PHS 2021 Webinar "Artificial intelligence in Healthcare" 27-28
 November 2021.
- Chairman of the PHS 2020 Webinar "Personalized medicine: A challenging health care model for human wellness" 28-29 November 2020.
- Chairman of the "International Conference on Pharmaceutical and Healthcare Sciences" PHS 2019 – Towards a new Pharmacy Era; 6-7 November 2019, Hilton Green Plaza, Alexandria.
- Chairman of the 6th Scientific conference for the academic year 2017/2018.
- Member of the Arab Board of Pharmacy specialties since academic year 2021/2022.
- Member of Alex Co for Pharmaceutical and Chemical Industries Audit committee.
- Participated in the preparation of the 9th Environmental Forum for Alexandria University Maryout Lake Future and Alexandria Development on 21/4/2019.

Activities as Dean for Faculty of Pharmacy Alexandria University

- Initiation of the renewal of the faculty institutional accreditation and accreditation of educational programs in December 2020 from the "The National Authority for Quality Assurance and Accreditation of Education – NAQAAE" which was awarded in November 2021.
- Initiation of application for international accreditation from Accreditation Council for Pharmacy Education (ACPE) International Service Program (ISP) in the United States of America (International Accreditation Program) for undergraduate bachelor's degree of PharmD and bachelor's degree PharmD (clinical Pharmacy) at the Faculty of Pharmacy in April 2023.
- Implementing the basis for the undergraduate students of the new PharmD program that started in 2019 which includes 5 years of college study in addition to a 6th year of obligatory training in hospitals, pharmacies and pharmaceutical companies.
- MOUs with highly ranked universities in Europe and USA for example Universita
 degli Studi G. d'Annunzio Pescara in Italy, Polytech Angers-University of Angers in
 France, Saarland University in Germany, the Pharmaceutical Research Institute
 (PRI) at Albany College of Pharmacy and Health Sciences in USA and L'Universite
 de Caen Normandie in France.
- New post graduate degrees; Radio pharmacy Master of science (in collaboration with IAEA), Professional Master and Diplomas in Pharmacogenomics in Quality assurance and healthcare excellence, in Pharmacovigilance and in Health economics, in addition to the undergraduate certificates in Pharmaceutical manufacturing excellence (in collaboration with Universita degli Studi G. d'Annunzio Pescara, Italy) and the Oncology certificate.
- Development of the faculty press unit and supplying it with highly efficient press machine and shredders for the old exams.
- Renewing the faculty server for the first time since 2009 by raising personal funding from pharmaceutical company and faculty members.
- Implementation of the "Green Cycle project" (started October 2022), aiming at increasing the greenery and applying recycling in the premises of the faculty of Pharmacy, Alexandria University.

 Raising sponsorship for the Faculty's International Conference PHS 2022 from about 20 sponsors including pharmaceutical companies, hospitals, community pharmacies and the Arab Academy for Science, Technology and Maritime transport.

Activities as Vice Dean for Community Service Affairs and Environmental Development

- Preparing the Science Park in collaboration with Vitabiotics Pharmaceuticals for the EJAC accreditation ISO17025.
- Renovating of the old building entrance and the ground floor from donations of Pharco Pharmaceuticals.
- Renovating the students' lockers in the old building from donations of Borg Pharmaceuticals and Faculty of Pharmacy Staff member.
- Raising sponsorship for the Faculty's International Conference PHS 2019 and PHS 2022 from more than 20 sponsors including pharmaceutical companies, hospitals, community pharmacies and the Arab Academy for Science, Technology and Maritime transport.
- Communicating with the pharmaceutical companies, the Syndicate, number of charity societies on an ongoing basis, and collect medicines to participate in the university's medical and community convoys.
- Coordinating and supervising many successful convoys in Alexandria, Elbehira, Elameria, Matrouh and Siwa.
- Coordinating and supervising many workshops, seminars and Informative Lectures (about 33 events).
- Coordinating and supervising many Charitable Markets and Community Activities (about 13 event).

Leadership and academic activities

- Head of the Community Service Affairs and Environmental development Committee 12/2017 until 10/2020.
- Active member of Community service Affairs and Environmental development

Committee of Alexandria University until 8/2016 - 11/2017.

- Chairman of the Security and Safety Committee.
- Supervising units of special nature.
 - o Science Park unit
 - Pharmaceutical Services unit
- Supervisor for the summer training for clinical pharmacy program.
- Active member of the executive committee for the new and special programs.
- Coordinator of the finance committee of the clinical program 2012-2017.
- Active member of the quality assurance unit in the department of microbiology and the faculty of pharmacy.
- Active member of Community service Affairs and Environmental development Committee 2009-2010 and 8/2016-11/2017.
- Active member of the Faculty's Council, Faculty of Pharmacy, Alexandria University, Egypt 2007/2008 and 2015/2016.
- Active member in the council of the department of microbiology and immunology department, faculty of pharmacy, Alexandria University.
- Member of the Syndicate of pharmacists.
- Active member of the post graduate studies committee 2013-2017.
- Participating in preparing a strategy for developing higher education in the health sector in Egypt.
- Lecturing in the health insurance in aboukeer to physicians and pharmacists on Antibiotics Abuse 25/3/2012.
- Lecturing in the Egyptian Student Pharmacy Federation ESPF-Alex, Lecture title "Enemies roaming about" 3/2015.
- Member of the clinical pharmacy students admission exam preparation committee
- Participating in improving the post graduate studies program of the microbiology department, faculty of pharmacy, Alexandria university.
- Member of the research project for the diagnostics of hepatitis C virus "Investigation of anti-hepatitis C (HCV) antibodies in the serum of HCV-infected Egyptian patients at different stages of disease prognosis and treatment", funded by the Egyptian Science and Technology Development Fund (STDF).
- Member of the research project for the diagnostics of mycobacterium "Investigation of novel Mycobacterium tuberculosis antigens as potential serodiagnostic tools and possible vaccine candidates", funded by the Egyptian Science and Technology Development Fund (STDF).
- Peer reviewer for the Internationally cited journal 'African Journal of Microbiology Research' 2014.
- Organizing and lecturing a workshop entitled: "PCR, principles and clinical and

pharmaceutical applications".

Invited Talks / Posters

- 16-18/5/2016 <u>Invited speaker</u> to the 4th International Conference on Bacteriology and Infectious Diseases 2016, San Antonio, Texas, USA.
 - **Talk** entitled: Characterization and Kinetics Study for Rhamnolipids Produced by an Environmental *Pseudomonas aeruginosa* Isolate.
- 27-29/10/2015 <u>Invited speaker</u> to the First PUA International Conference on Advances in Pharmaceutical Sciences, Pharos University, Alexandria, Egypt Talk entitled: Molecular Characterization, Biofilm Formation and Enzyme Purification and Characterization for an Environmental Chitosanase-Producing Isolate from Alexandria Governorate.
- **18-21/8/2015** Invited speaker to the World Congress and Expo on Applied Microbiology, 5, Frankfurt, Germany.
 - **Talk** entitled: Biosurfactants production by bacillus strain from an environmental sample in Egypt.
- 5-8/5/2014 <u>Invited speaker</u> to the Annual International Conference on Pharmaceutical Sciences, Athens, Greece in Athens Institute for Education and Research, Athens Greece.
 - **Talk** entitled: Biochemical versus molecular methods in the detection of bacterial contaminants in some Egyptian pharmaceuticals in Egypt.
- 1-3/12/2013 The 14th Arab International Conference of materials science "Materials for Biomedical Application" at Institute of Graduate Studies and Research Alexandria, Egypt.
 - **Poster** entitled: Targeting and combating bacterial biofilms on Abiotic surfaces: A new Niosome application.
- 31/3-3/4-2008 162nd Meeting of the Society for General Microbiology at Edinburgh International Conference Centre, Edinburgh, Scotland.
 - **Poster** entitled: Influence of aqueous green tea extract on the antimicrobial activity of some antibiotics against multiresistant clinical isolates.

Invited Talks / Posters by other Co-Authors

• 9-11/2/2015 "3rd FUE International Conference of Pharmaceutical Sciences", at the Intercontinental City stars Hotel, Cairo, Egypt.

Poster entitled: Antibiofilm activity of vancomycin liposomes on abiotic surfaces.

- 31/10-2/11/2014 International meeting on emerging diseases and survellance, Vienna, Austria.
 - **Poster** entitled: It is a no-brainer: never use fusidic acid alone! A study from Alexandria, Egypt.
- 25-28/10/2014 The 22nd Annual Conference of the Egyptian Society for Infection Control (ESIC) (APIC/Egypt Chapter) & The 5th Conference of the Eastern Mediterranean Regional Network for Infection Control (EMRNIC) "Infection Preventionists: Ready for Disasters" Porto Marina Resort, North Coast, Egypt.
 Poster entitled: Comparative study on diagnostic kits for Hepatitis C antibodies tested in infected Egyptian patients.
- 25-28/10/2014 The 22nd Annual Conference of the Egyptian Society for Infection Control (ESIC) (APIC/Egypt Chapter) & The 5th Conference of the Eastern Mediterranean Regional Network for Infection Control (EMRNIC) "Infection Preventionists: Ready for Disasters" Porto Marina Resort, North Coast, Egypt.
 Talk entitled: Fusidic Acid Resistance in Clinical Isolates: What Is Next?
- 2-5/7/2012 The Seventh summer meeting: resistance, adaptation and bioremediation, Edinburgh, United Kingdom.
 Poster entitled: Is fusidic acid a valid alternative for topical treatment of multi-drug resistant Staphylococcal infections? Results from major hospitals in Alexandria, Egypt.

Attended Conferences / Workshops

- March 2018 Pharmacy Expo, Cairo Egypt.
- **15-18/12/2014** "2nd International workshop on Molecular therapeutics" at Faculty of Pharmacy, Alexandria University, Egypt.
- **16/11/2014** Workshop entitled "Questionnaire Committee Coordinators training" in Quality Assurance Centre and Directorate, University of Alexandria, Egypt.
- **7-9/4/2014** Biovision Alexandria International Conference 2014. "New life sciences: The next decade". Bibliotheca Alexandrina, Alexandria, Egypt.
- **13-16/11/2012** The 17th Medical Research Institute Conference (5th International) Advances in Medical Research "Obesity", Hilton Green Plaza Hotel, Alexandria, Egypt.

- **7-8/11/2012** Alex Health 2012, International conference on "Challenges Facing Health", Bibliotheca Alexandria, Alexandria, Egypt.
- **25-26/4/2012** 3rd International Scientific Conference of Faculty of Pharmacy Cairo University "Good Pharmacy Practice", Cairo Egypt.
- 22-25/4/2012 Biovision Alexandria International Conference 2012. "New life sciences: Linking science to society". Bibliotheca Alexandrina, Alexandria, Egypt.
- 17-20/10/2011 The 20th annual conference of the Egyptian Society of Infection Control and the 4th Conference of the Eastern Mediterranean Regional Network for Infection Control. "Infection Preventionists: Marathoning towards zero". Alexandria, Egypt.
- **16/2/2011** Workshop entitled "Non-conventional methods for optimization in experimental studies", Science Park Department, Faculty of Pharmacy, Alexandria University, Egypt.
- **19-22/10/2010** The 16th conference (4th international) "Advances in Medical Research; Quality in Medical education and Practice" Medical Research Institute, Alexandria University, Egypt.
- **25-26/4/2010** The 17th international conference of the Egyptian society for medical microbiology ESMM "New modalities in microbiology", in collaboration with Microbiology Department, Faculty of Medicine, Cairo University, Egypt.
- 14-15/4/2010 The Egyptian society of biochemistry and molecular biology ESBMB.
 "Biochemistry and molecular biology; Present and Future. Faculty of Science, Cairo University, Egypt.

FLDC Workshops

• FLDC workshops attended:

17-18/9/2014	References research management systems
27-28/11/2013	Research ethics
13-14/11/2013	Quality standards in the education process
22-23/5/2012	Managing research teams
22-23/10/2011	Managing time and meetings
8-9/10/2011	Competing for research funds
15-16/5/2017	Strategic thinking and leadership
29-30/5/2017	Innovative problem solving and decision making
3-4/6/2017	Executive leadership skills development
14-15/6/2017	University financial aspects
26-27/6/2017	University laws and regulations

Training Matrix to Qualify the Leaders:

15-16/5/2017 Strategic thinking and leadership.

29-30/7/2017 Innovative problem solving and decision making.

3-4/6/2017 Executive leadership skills development.

14-15/6/2017 University financial aspects.

26-27/7/2017 University laws and regulations.

Publications

- Mervat A. Kassem and Elsayed Aboulmagd. In Vitro Study on the Antibacterial Activities of Levofloxacin, Amikacin and Cefepime against Multiresistant Pseudomonas aeruginosa Clinical Isolates, New Egyptian Journal of Microbiology, 2006;(14): 171-83.
- Soad Hawash and Mervat A. Kassem. Synthesis of some new quinoxalines and 1,2,4-triazolo[4,3-a]-quinoxalines for evaluation of in vitro antitumor and antimicrobial activity, Archiv der Pharmazie Chemistry in Life Sciences, 2006;339(10): 564-571. https://doi.org/10.1002/ardp.200600061
- **3. Mervat A. Kassem**, Norhan Fanaki, Mohamed A. Fawzi, Fatma Dabbous. Effect of green tea extract on some virulence factors of selected multiresistant clinical isolates, *Egyptian Journal of Medical Microbiology*, 2007;16(3): 461-71.
- **4.** Suzan M. Saleh and **Mervat A. Kassem.** Respiratory Pathogens Colonization on Tongue Surface of Institutionalized Elderly in Alexandria, *Egyptian Dental Journal*, 2007;(53): 2751-70.
- 5. Norhan Fanaki, Mervat A. Kassem, Mohamed A. Fawzi, Fatma Dabbous. Influence of Aqueous Green Tea Extract on the Antimicrobial Activity of some Antibiotics against Multiresistant Clinical Isolates, *Egyptian Journal of Medical Microbiology*, 2008;(17): 449-60.
- 6. Mervat A. Kassem. Activity of Moxifloxacin and Gentamicin Singly and Combined with Diclocenac or Ketorolac against Planktonic and Biofilm Cells of Staphylococci Isolated from Ocular Flora, Egyptian Journal of Medical Microbiology, 2009;(18): 119-28.

- Mervat A. Kassem, Norhan Fanaki, Hamida Abou-Shleib, Fatma Dabbous, and Yasser R. Abdel-Fattah. Optimization of Biosurfactant Production from Pseudomonas aeruginosa through Factorial Designs, New Egyptian Journal of Microbiology, 2009;(23): 36-51.
- Norhan Fanaki, Mervat A. Kassem, Nabil Eltoukhy, Rana Magdy, Hamida Abou-Shleib. Factors Affecting the Biopolymer-Degrading Activity of Microorganisms Isolated from Environmental Samples in Alexandria, *Egyptian Journal of Medical Microbiology*, 2009;(18): 129-40.
- Zeitoun H, Kassem M, Raafat D, Abou Shlieb H, Fanaki N. Microbiological testing of pharmaceuticals and cosmetics in Egypt. *BMC Microbiology*, 2015; 15:275. PMID: 26653032, PMCID: PMC4674922, DOI: 10.1186/s12866-015-0609-z
- 10. Shehat MG, Bahey-El-Din M, Kassem M, Farghaly FA, Abdul-Rahman MH, Fanaki NH. Recombinant expression of the alternate reading frame protein (ARFP) of Hepatitis C virus genotype 4a (HCV-4a) and detection of ARFP and anti-ARFP antibodies in HCV-infected patients. *Archives of virology*, 2015; 160: 1939-1952. DOI: https://doi.org/10.1007/s00705-015-2465-4
- 11. Barakat H, Kassem M, El-Khordagui L, Khalafallah N. Vancomycin-Eluting Niosomes: A New Approach to the Inhibition of Staphylococcal Biofilm on Abiotic Surfaces. AAPS PharmSciTech. 2014; 15(5): 1263-74. PMID: 24895077, PMCID: PMC4179651, DOI: 10.1208/s12249-014-0141-8
- **12. Kassem M,** Fanaki N, Dabbous F, Abou-Shleib H, Abdel-Fattah YR. Biosurfactants production from an environmental bacillus strain in Egypt. *Egyptian Journal of Biotechnology*, **2014**;46: 66-84.
- **13. Kassem M**, Yakout M, El-Nakeeb M, Seiffein N. Phenotypic and genotypic evaluation of gatifloxacin resistance in *Staphylococcus aureus* and *Pseudomonas aeruginosa* clinical isolates in Egypt. *Egyptian Journal of Biotechnology*, **2015**; 50: 119-134.
- **14. Kassem M**, Eltoukhy N, Magdy R, Fanaki N, Abou-Shleib H. An environmental chitosan-roducing isolate from Alexandria governorate, Egypt: its molecular characterization, biofilm formation and enzyme purification and characterization. *New Egyptian Journal of Microbiology*, **2013**; 36: 177-97.

- **15. Kassem M,** Fanaki N, Abou-Shleib H, Dabbous F, Abdel-Fattah YR. Characterization and kinetic study for rhamnolipids produced by an environmental *Pseudomonas aeruginosa* isolate, *Egyptian Journal of Medical Microbiology*, **2013**; 22: 123- 130.
- **16.** Abouelfetouh A, **Kassem M**, Naguib M, El-Nakeeb M. Investigation and treatment of fusidic acid resistance among methicillin resistant staphylococcal isolates from Egypt. Abouelfetouh Alaa, Kassem Mervat, Naguib Marwa, and El-Nakeeb Moustafa. *Microbial Drug Resistance*. January **2017**, 23(1): 8-17. doi:10.1089/mdr.2015.0336.
- 17.H Zeitoun, M Bahey-El-Din, MA Kassem, HM Aboushleib. Mycothiol acetyltransferase (Rv0819) of *Mycobacterium tuberculosis* is a potential biomarker for direct diagnosis of tuberculosis using patient serum specimens.
 2017, Letters in applied microbiology 65 (6), 504-511. PMID: 28905401 DOI: 10.1111/lam.12801
- **18.** Shalaby MA, **Kassem MA**, Mahmoud OM and Mohamed NM. Antityramine potential of Lactobacillus rhamnosus (LGG®) in cheese samples collected from Alexandria, Egypt. *Food Biotech.* **(2020)**, 34(3): 243-261.
- 19. Omnia Morsy, Mervat Amin Kassem, Abeer Elsayed Abd El-Wahab, Nelly Mostafa Mohamed. Isolation and Molecular Identification of a Novel Tyramine-producing Bacterium, Rummeliibacillus pycnus. International Journal of Microbiology and Biotechnology 2020. 5(4):184-192. doi: 10.11648/j.ijmb.20200504.13
- 20. Book Chapter: eBook entitled "Frontiers in Anti-Infective Agents (Volume 3) 21st Century Challenges in Antimicrobial Therapy and Stewardship. Chapter 1; "GLOBAL LANDSCAPE OF MICROBIAL RESISTANCE" by Elsayed Aboulmagd, Mervat A. Kassem and Alaa Abouelfetouh. Published by Bentham Science Publishers Pte. Ltd. Singapore, November, 2020.
- **21.**Azza S. Zakaria, **Mervat A. Kassem**, Mona S. El Far and Eva A. Edward. Characterization, in-vitro evaluation of probiotic potential and antagonistic activity of selected lactic acid bacteria strains isolated from natural origin against some human pathogens. Bull. Pharm. Sci., *Assiut University* (**2021**). 44 (1) :225-241. https://doi.org/10.21608/BFSA.2021.174149

- 22. Mona S. El Far, Azza S. Zakaria, Mervat A. Kassem, Abdalla Wedn, Maha Guimei and Eva A. Edward. Promising biotherapeutic prospects of different probiotics and their derived postbiotic metabolites: in-vitro and histopathlogical investigation. BMC Microbiology (2023). 23, 122 https://doi.org/10.1186/s12866-023-02866-1
- **23.** Abdallah, S. M.; **Kassem, M. A**.; Mohamed, N. M.; Bahey-El-Din, M. Exploration of the Potential of the ATP-Binding Cassette (ABC) Transporter Antigen as a Vaccine Candidate Against *Acinetobacter baumannii* Infections. *J. Adv. Pharm. Res.* **2023**, 7 (2), 000-00. DOI: 10.21608/aprh.2023.177396.1202