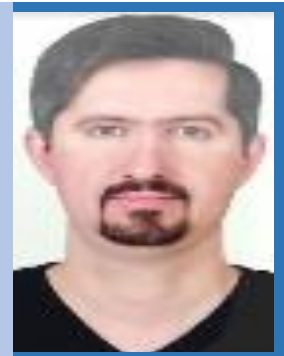


# SOBHAN GHAFOURIAN



## CONTACT

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## RESEARCH INTEREST

**Toxin antitoxin systems**  
Antimicrobial Resistance

**Biofilm formation**

Persister cells and  
Heteroresistance

**Probiotics**  
**anticancer**

## EDUCATION

BSC Azad Islamic University of Arak  
2000 – 2004  
Microbiology

MSC University Putra Malaysia  
2007 – 2011  
Medical Microbiology

PhD University Putra Malaysia  
2011 – 2014  
Medical Microbiology

My interested research topic in my laboratory focuses to: antibiotic resistance bacteria, Persister cells, Biofilm formation and Toxin -antitoxin (TA) systems. We focus to new antimicrobial agents and also the genetic could regulate the antimicrobial failure in acute and chronic bacterial infections. Many of genes that responsible for antibiotic resistance, biofilm formation and possible persister cells are under regulation of TA genes. By silencing of these TA loci by different methods, it is possible to suggest these TA loci as novel antimicrobial targets.

- 2024 -now • Professor in the Department of Microbiology at Ilam University of Medical Sciences. Research Projects: persister cells, biofilm formation in chronic infections
- 2020 -2024 • Associate Professor in the Department of Microbiology at Ilam University of Medical Sciences. Research Projects: Gene regulation during bacterial biofilm development by TA gene knockout and bacterial persister and heteroresistance.
- 2015 -2019 • Assistant Professor in the Department of Microbiology at Ilam University of Medical Sciences. Research Projects: bacterial biofilm development, antibiotic resistance, Peptide Nucleic Acid (PNA) as antisense therapy against TA genes and control of pathogenesis of bacteria and natural products against antibiotic resistance bacteria.
- 2005 -2007 • Laboratory manager in Microbiology division of Main Laboratory in Ilam University of Medical Sciences, Ilam, Iran.

## HONORS AND MEMBERSHIPS

Member American Society for Microbiology

- Top Researcher of the Year, (IUMS) (2014, 2015 and 2016)
- Member Iranian Society for Microbiology

## TEACHING EXPERIENCE

2015 -present

- **Lectures:** Molecular diagnosis, Bacterial Pathogenesis, Medical Microbiology, Prokaryotic molecular genetics, molecular biology techniques, genetic engineering, Diagnostic bacteriology for undergraduate and postgraduate and medical students

## PUBLICATIONS

Scopus

EXPORT DATE: Feb 2024

1. Heidari H, Moradkasani S, Ghanavati R, Kalantar-Neyestanaki M, Kouhsari E, **Ghafourian S**, et al. Bedaquiline and delamanid treatment outcomes among patients with drug-resistant tuberculosis: a systematic review and meta-analysis. *Minerva Respir Med* 2024;63:16-24.
2. Asadinezhad M, Pakzad I, Asadollahi P, **Ghafourian S**, Kalani BS. Proteomics Exploration of *Brucella melitensis* to Design an Innovative Multi-Epitope mRNA Vaccine. *Bioinform Biol Insights*. 2024 Aug 30;18:11779322241272404.
3. Etemad A, Kalani BS, **Ghafourian S**, Khodaei N, Davari M, Sadeghifard N. GNAT toxin may have a potential role in *Pseudomonas aeruginosa* persistence: an in vitro and in silico study. *Future Microbiol*. 2024 Jan;19:21-31.
4. Asadinezhad M, Khoshnood S, Asadollahi P, **Ghafourian S**, Sadeghifard N, Pakzad I, Zeinivand Y, Omid N, Hematian A, Kalani BS. Development of innovative multi-epitope mRNA vaccine against *Pseudomonas aeruginosa* using in silico approaches. *Brief Bioinform*. 2023 Nov 22;25(1):
5. Valadbeigi H, Sadeghifard N, Kaviar VH, Haddadi MH, **Ghafourian S**, Maleki A. Effect of ZnO nanoparticles on biofilm formation and gene expression of the toxin-antitoxin system in clinical isolates of *Pseudomonas aeruginosa*. *Ann Clin Microbiol Antimicrob*. 2023 Oct 5;22(1):89.
6. Ghasemian, S., Karami-Zarandi, M., Heidari, H., Khoshnood, S., Kouhsari, E., **Ghafourian, S.**, Maleki, A., Kazemian, H. Molecular characterizations of antibiotic resistance, biofilm formation, and virulence determinants of *Pseudomonas aeruginosa* isolated from burn wound infection (2023) *Journal of Clinical Laboratory Analysis*, 37 (4), art. no. e24850, .
7. Kouhsari, E., Sadeghifard, N., Khadiv, A., Sayadi, H., Amiriani, T., **Ghafourian, S.**, Valadbeigi, H., Krutova, M. Heteroresistance to clarithromycin and metronidazole in patients with a *Helicobacter pylori* infection: a systematic review and meta-analysis (2022) *Annals of Clinical Microbiology and Antimicrobials*, 21 (1), art. no. 19, . Cited 4 times.
8. Dolatshahi, Z., Nargesi, S., Sadeghifar, J., Mezghinejad, F., Jafari, A., Bazayr, M., **Ghafourian, S.**, Sani'ee, N. Economic evaluation of laboratory diagnostic test types in Covid-19 epidemic: A systematic review (2022) *International Journal of Surgery*, 105, art. no. 106820, . Cited 2 times.
9. **Ghafourian, S.**, Ghafourian, E., Zarei, S.M., ... Wang, Y.-H., Shokoohinia, Y. Bioassay-guided isolation of phenolic apoptosis inducer anticancer agents from *Berberis vulgaris* fruits. *Journal of Medicinal Plants*, 2022, 21(83), pp. 35–46
10. Mahmoudi, M., Sadeghifard, N., Maleki, A., Yeo, C.C., **Ghafourian, S\***. relBE toxin-antitoxin system as a reliable anti-biofilm target in *Pseudomonas aeruginosa*. (2022) *Journal of Applied Microbiology*, 133 (2), pp. 683-695. Cited 1 time.

11. Asadollahi, P., Pakzad, I., **Ghafourian, S.**, Kazemian, H., Fatahi, R., Sadeghifard, N., Kalani, B.S. In silico Investigation of Lon Protease as a Promising Therapeutic Target.(2022) **Drug Research**, 72 (4), pp. 180-188. Cited 1 time.
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13. Norouzi, M., Maleki, A., Aboualigalehdari, E., **Ghafourian, S\***.TYPE II TOXIN- ANTITOXIN SYSTEMS IN CLINICAL ISOLATES OF ANTIBIOTIC RESISTANT *Acinetobacter baumannii* [TOKSIN TIPA II - ANTITOKSIN SISTEMI U KLINIČKIM IZOLATIMA OTPORNI NA ANTIBIOTIK *Acinetobacter baumannii*] (2022) **Genetika**, 54 (2), pp. 625-632.
14. Asadollahi, P., Pakzad, I., Sadeghifard, N., **Ghafourian, S.**, Kazemian, H., Kaviar, V.H., Fattahi, R., Kalani, B.S. Immunoinformatics Insights into the Internalin A and B Proteins to Design a Multi-Epitope Subunit Vaccine for *L. monocytogenes* (2022) **International Journal of Peptide Research and Therapeutics**, 28 (1), art. no. 47, . Cited 4 times.
15. Kazemian, H., Zarandi, M.K., Zargoush, Z., **Ghafourian, S.**, Sadeghifard, N., Jalilian, A., Shafieian, M., Pakzad, I. The prevalence of gonococcal and non-gonococcal infections in women referred to obstetrics and gynecology clinics (2022) **Infezioni in Medicina**, 30 (2), pp. 247-253.
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18. Jalili, M., Pakzad, I., **Ghafourian, S\***, Badakhsh, B. In vitro Eradication of *Pseudomonas aeruginosa* Persister Cell Producers by *Peganum harmala* (2022) **Clinical Laboratory**, 68 (2), pp. 334-339. Cited 1 time.
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22. Kazemian, H., Heidari, H., Kardan-Yamchi, J., **Ghafourian, S.**, Pakzad, I., Kouhsari, E., Valadbeigi, H., Sadeghifard, N. Comparison of toxin-antitoxin expression among drug-susceptible and drug-resistant clinical isolates of *Mycobacterium tuberculosis* (2021) **Advances in Respiratory Medicine**, 89 (2), pp. 110-114. Cited 3 times.
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45. Kazemian, H., Heidari, H., Ghanavati, R., Mohebi, R., **Ghafourian, S.**, Shavalipour, A., Taji, A., Houri, H. Characterization of antimicrobial resistance pattern and molecular analysis among extended spectrum  $\beta$ -lactamase-producing *Escherichia coli* (2016) ***Pharmaceutical Sciences***, 22 (4), pp. 279-284. Cited 10 times.
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economical potentials of Glycyrrhiza glabra L: A review (2015) *Journal of Chemical and Pharmaceutical Sciences*, 8 (4), pp. 683-692. Cited 20 times.

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## Selected Papers Presented in International Congress

1. **Sobhan Ghafourian**, Nourkhoda Sadeghifard, Abbas Maleki, Mehrnoush Safikhani. Study of toxin-antitoxin system effects on virulence factor expression in *Shigella flexneri* isolates. **ECCMID 2019, Amsterdam, Netherlands.**  
<https://elibrary.escmid.org/?search%5Bfrom%5D=0&search%5Bquery%5D=GHAFOURIAN&search%5Bdate%5D=#results>
2. **Sobhan Ghafourian**, Abbas Maleki, Maryam Zamirnasta, Hassan Valadbeigi, Nourkhoda Sadeghifard. Respiratory tract microbiota, useful or harmful? **ECCMID 2019, Amsterdam, Netherlands.**  
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3. **Sobhan Ghafourian**, N. Sadeghifard. Toxin antitoxin systems as potent antimicrobial target in *Staphylococcus aureus*. **ECCMID 2018, Madrid, Spain.**  
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4. Nourkhoda Sadeghifard, Patil Prashant, S. Ghafourian. Anti-biofilm properties of *Peganum harmala* against *Candida albicans*. **ECCMID 2016, Amsterdam, Netherlands.**  
<https://elibrary.escmid.org/?search%5Bfrom%5D=0&search%5Bquery%5D=GHAFOURIAN&search%5Bdate%5D=#results>
5. **S. Ghafourian**, N. Sadeghifard. Peptide nucleic acid anti-mazE antitoxin as a novel strategy for eradication of antibiotic-resistant *Staphylococcus aureus*. **ECCMID 2016, Amsterdam, Netherlands.**  
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6. Nourkhoda Sadeghifard, **Sobhan Ghafourian**; Liam Good. Toxin-antitoxin system in *Staphylococcus aureus*. ECCMID 2015, Copenhagen, Denmark.  
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7. **Ghafourian, S.**(1)\*; Sekawi, Z.(1); Good, L.(2); Sadeghifard, N.(3). MazEF toxin-antitoxin system is a widespread and sensitive antimicrobial target in antibiotic-resistant *Staphylococcus aureus*. ECCMID 2014, Barcelona, Spain  
<https://elibrary.escmid.org/?search%5Bfrom%5D=0&search%5Bquery%5D=GHAFOURIAN&search%5Bdate%5D=#results>
8. Z. Sekawi, **S. Ghafourian**, V. Neela, N. Sadeghifard, M. Raftari. Toxin-antitoxin system: a key for antibacterial targets among *Acinetobacter baumannii*. ECCMID 2013, Berlin, Germany  
<https://elibrary.escmid.org/?search%5Bfrom%5D=0&search%5Bquery%5D=GHAFOURIAN&search%5Bdate%5D=#results>
9. N. Sadeghifard, **S. Ghafourian**, A. Maleki, R. Mohebi (Ilam, IR). Prevalence of intestinal parasitic infections among suspected referred patients to a reference laboratory in Ilam, Iran. ECCMID 2012, London, United Kingdom  
<https://elibrary.escmid.org/?search%5Bfrom%5D=0&search%5Bquery%5D=GHAFOURIAN&search%5Bdate%5D=#results>
10. N. Sadeghifard, Z. Rasaei, M.R Zolfaghari, **S. Ghafourian**. Prevalence of PAPI-1 in clinical isolates of *Pseudomonas aeruginosa*. ECCMID 2012, London, United Kingdom  
<https://elibrary.escmid.org/?search%5Bfrom%5D=0&search%5Bquery%5D=GHAFOURIAN&search%5Bdate%5D=#results>
11. **Sobhan Ghafourian**. Toxin and antitoxin system as on antibiotic regulatory and pathogenic systems in bacteria. 18<sup>th</sup> International Iranian congress of microbiology, 2017, Tehran, Iran.
12. **Sobhan Ghafourian** Toxin antitoxin systems as an antimicrobial target in bacteria. 19<sup>th</sup> International Iranian congress of microbiology, 2018, Tehran, Iran.
13. Abbas Maleki, **Sobhan Ghafourian**, Mostafa Akbari Qomi, Norkhoda Sadeghifard. Antibiotic Susceptibility and Molecular Analysis of *Acinetobacter Baumannii* Strains Isolated from Three Teaching Hospitals by REP-PCR and ERIC-PCR. *The 13th Iranian & The Second International Congress of Microbiology*
14. Mohebi, R., Sadeghifard, N., **Ghafourian, S.**, Abouali galehdari, E. characterization of first imp metallo-beta lactamase gene producing *pseudomonas aeruginosa* strains isolated in Ilam, Iran 4<sup>TH</sup> Congress of European Microbiologists Geneva, Switzerland, June 26-30, 2011.
15. **Ghafourian, S.** *Klebsiella pneumoniae* production extended spectrum beta- lactamase in respiratory tract. 4<sup>TH</sup> Congress of European Microbiologists Geneva, Switzerland, June 26-30, 2011.

## MAIN SUPERVISOR

| NAME OF STUDENTS      | TITLE OF THESIS                                                                                                                                                                          | PROGRAMME | STATUS                                                        |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------|
| Ali Hematian          | <i>Relbe</i> as a novel target for heteroresistant <i>Acinetobacter baumannii</i>                                                                                                        | PhD       | Graduated<br>(Shahid Beheshti University of Medical Sciences) |
| Reza Mohebi           | Treatment of patients with chronic respiratory tract infections                                                                                                                          | PhD       | Studying<br>(Pasteur Institute of Iran)                       |
| Shahriyar Bakhti      | Toxin Antitoxin System Genetically is Responsible for Production of Persister Cells in <i>Staphylococcus aureus</i> Clinical Isolates                                                    | MSc       | Graduated                                                     |
| Mina Mahmoudi         | Toxin-Antitoxin Systems as a Reliable Antimicrobial Target for Inhibition of Biofilm Formation in <i>Pseudomonas aeruginosa</i>                                                          | MSc       | Graduated                                                     |
| Masoumeh Norouzi      | Determination of toxin-antitoxin system as an antimicrobial target in <i>Acinetobacter baumannii</i> clinical isolates                                                                   | MSc       | Graduated                                                     |
| Maryam Mohammadian    | The Effect of <i>Peganum harmala</i> on Biofilm of <i>Staphylococcus aureus</i> Isolated from Burn Wound Infections                                                                      | MSc       | Graduated                                                     |
| Khadijeh Esmaeili     | Uropathogenic Bacteria and Antibiotic Resistance Pattern among Patients Referring to Emam Khomeini Hospital , Ilam, Iran                                                                 | MSc       | Graduated                                                     |
| Zahra Chavak          | The effect of oak bark extract on biofilm of <i>Streptococcus mutans</i> clinical isolates                                                                                               | MSc       | Graduated                                                     |
| Mahsa Morovati        | Phenotypic and molecular detection of pathogenic bacteria isolated from raw and pasteurized milk and cheese collected from Ilam and determination of their antibiotic resistance pattern | MSc       | Graduated                                                     |
| Mahsa Jalili          | Anti- persister effect of <i>Peganum harmala</i> alcoholic extract against <i>Pseudomonas aeruginosa</i> clinical isolates                                                               | MSc       | Graduated                                                     |
| Maryam Habibi         | Evaluation of toxin-antitoxin system as an anti-persister target in <i>Staphylococcus aureus</i> clinical isolates                                                                       | MSc       | Graduated                                                     |
| Parvin Bahmani Nezhad | Evaluation of antibiotic resistance pattern and persister cells in <i>Helicobacter pylori</i> collected from patients referring to Mostafa Khomeini                                      | MSc       | Graduated                                                     |

|                  |                                                                                                |         |           |
|------------------|------------------------------------------------------------------------------------------------|---------|-----------|
|                  | hospital, Ilam, Iran and determination the recurrent of infection.                             |         |           |
| Ehsan Ghafourian | The Effect of Berberis Vulgaris Fruits against Breast Cancer <i>in vitro</i>                   | Pharm.D | Graduated |
| Yosra Naghipour  | MazF toxin of Toxin-Antitoxin System as a Candidate for Elimination of Colorectal Cancer Cells | MSc     | Graduated |

#### CO-SUPERVISOR

| NAME OF STUDENTS    | TITLE OF THESIS                                                                                                                                                 | PROGRAMME | STATUS                                   |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------|
| Farzad Mohammadi    | Molecular study of Enterococcus faecalis isolates In Ilam, Iran by PFGE and MLST methods                                                                        | PhD       | Graduated<br>(Azad university of Tehran) |
| Zahra Tahmasebi     | Study of Microbial and drug resistance pattern of Ball (bronchoalveolar lavage) isolates during one year from hospitalized patients from Imam Khomani Ilam,Iran | MSc       | Graduated                                |
| Maryam Karkoub      | Genetic analysis of Shigella flexneri isolates from patients with diarrhea in Ahvaz by Pulsed-field gel electrophoresis                                         | MSc       | Graduated                                |
| Sahar Shokouhi      | Genotyping of Dicrocoelium dendriticum in Cattle and Sheep by using the nad1 gene in three provinces west of IRAN.                                              | MSc       | Graduated                                |
| Hosna Rezazadeh     | Evaluation of antimicrobial effect and shear bond strength of composite resin containing nano ZNO particle used in orthodontics fixed retainer.                 | MSc       | Graduated                                |
| Nahid Mahdian       | The prevalence of Shiga Toxin-1 in Shigella spp. isolated from Diarrhea, Ahwaz, Iran                                                                            | MSc       | Graduated                                |
| Masoumeh hatami lak | Genetic Analysis of Multiple Drug-resistant Escherichia coli by Pulsed-field Gel Electrophoresis.                                                               | MSc       | Graduated                                |
| Nasrin Vazlizadeh   | Investigating the effect of Toxin-Antitoxin System expression on virulence factors in Klebsiella Pneumoniae clinical and environmental isolates                 | MSc       | Graduated                                |

#### EDITORIAL MEMBER

Recent Advances in Anti-Infective Drug Discovery (<https://www.benthamscience.com/journal/207/editorial-board> )

Journal of Basic Research in Medical Sciences (<https://jbrms.medilam.ac.ir/page/127/Editorial-Board> )

## BOOK

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | Toxin-Antitoxin Systems in <i>Pseudomonas aeruginosa</i> . 2021; Bentham sciences publishers., ISBN: 978-1-68108-794-8 Scopus indexed<br>( <a href="https://www.benthamscience.com/ebook_volume/3065">https://www.benthamscience.com/ebook_volume/3065</a> )(<br><a href="https://www.scopus.com/record/display.uri?eid=2-s2.0-85208867279&amp;origin=recordpage">https://www.scopus.com/record/display.uri?eid=2-s2.0-85208867279&amp;origin=recordpage</a> ) |
| 2. | Toxin - Antitoxin systems and Virulence Genes in <i>Enterococcus faecium</i> . 04/2014; LAMBERT Academic Publishing., ISBN: 978-3659517129 ( <a href="https://www.AMAZON.COM/TOXIN-ANTITOXIN-SYSTEMS-VIRULENCE-ENTEROCOCCUS/DP/3659517127">HTTPS://WWW.AMAZON.COM/TOXIN-ANTITOXIN-SYSTEMS-VIRULENCE-ENTEROCOCCUS/DP/3659517127</a> )                                                                                                                           |
| 3. | Antibacterial Activity Of Organic Acids On The Growth Of Selected Bacteria In Meat Samples. 06/2011; LAMBERT Academic Publishing., ISBN: 978-3844383942<br>( <a href="https://www.AMAZON.COM/ANTIBACTERIAL-ACTIVITY-ORGANIC-SELECTED-BACTERIA/DP/3844383948">HTTPS://WWW.AMAZON.COM/ANTIBACTERIAL-ACTIVITY-ORGANIC-SELECTED-BACTERIA/DP/3844383948</a> )                                                                                                       |
| 4. | Molecular characterization of ESBL producing Klebsiella SPP isolates:. 04/2011; LAP LAMBERT Academic Publishing., ISBN: 978-3844317312 ( <a href="https://www.amazon.com/Molecular-characterization-producing-Klebsiella-isolates/dp/3844317317">https://www.amazon.com/Molecular-characterization-producing-Klebsiella-isolates/dp/3844317317</a> )                                                                                                           |