



# Vahid Khalaj

Address: Biotechnology Research Center, Pasteur Institute of Iran, Pasteur Avenue, Tehran, Iran  
Tel.: (+98-912) 3165945  
E-mail: v\_khalaj@yahoo.com  
khalajs@pasteur.ac.ir

**ORCID: 0000-0003-1621-6394**

**Web of Science ResearcherID: U-2632-2017**

## Education

**September 1997–September 2001** Ph.D. (Molecular Biotechnology/Biochemistry University of Manchester, Manchester, United Kingdom)

**September 1987–July 1993** Doctorate (Medical Laboratory Sciences, Tehran University of Medical Sciences, Tehran, Iran)

## Work Experience

**September 2019–present:** Director of Educational, Cultural, and Student Affairs , Pasteur Institute of Iran

**January 2015–present:** Editor-in-chief (Iranian Biomedical Journal, Pasteur Institute of Iran, Tehran, Iran)

**September 2007–September 2014& June 2018–present:** Head of Medical Biotechnology Department, Pasteur Institute of Iran, Tehran, Iran)

**February 2005–present:** Full professor (Department of Biotechnology, Pasteur Institute of Iran, Tehran, Iran)

**August 2002–February 2005:** Senior scientist (F2G Ltd. Manchester, United Kingdom)

**June 1993–September 1997:** Scientist, Lab internal manager (Department of Biotechnology Pasteur Institute of Iran, Tehran, Iran)

## Membership

- A member of the Editorial Board: Journal of Medical Microbiology and Infectious Diseases (JOMMID)
- A member of the Editorial Board: Daru Journal of Pharmaceutical Sciences
- A member of the Scientific Board: Pharmaceutical Biotechnology, The Iranian Ministry of Health and Medical Education
- A member of Medical Council of Islamic Republic of Iran (IRIMC)

## Fields of research

Fungal biotechnology  
Functional genomics of fungi with focus on *Aspergillus fumigatus*  
Antifungal drug discovery

Recombinant pharmaceuticals

## TEACHING EXPERIENCE

- 1- Advanced genetic engineering (For PhD students)
- 2- Advanced molecular biology (For PhD students)
- 3- Cloning and expression in fungi (For MS and PhD students)
- 4- Transposons and their applications in functional genomics (For MS and PhD students)
- 5- DNA-Protein Interactions (For PhD students)
- 6- Microarray and Next Generation sequencing and their application in biology (For PhD students)

## Publications

\*: Corresponding author

1: Zarei B, Javidan Z, Fatemi E, Rahimi Jamnani F, Khatami S, **Khalaj V\***. Targetingc-Met on gastric cancer cells through a fully human fab antibody isolated from a large naive phage antibody library. *Daru*. **2020** Mar 19. doi: 10.1007/s40199-020-00334-z.

2: Azizi A, SharifiRad A, Enayati S, Azizi M, Bayat M, **Khalaj V\***. Absence of AfuXpot, the yeast Los1 homologue, limits *Aspergillus fumigatus* growth under amino acid deprived condition. *World J Microbiol Biotechnol*. **2020** Jan30;36(2):28. doi: 10.1007/s11274-020-2805-8. PubMed PMID: 32002680.

3: Derakhshandeh S, Shahrokhi N, **Khalaj V**, Habibi M, Moazzezy N, Asadi Karam MR, Bouzari S. Surface display of uropathogenic *Escherichia coli* FimH in *Lactococcus lactis*: In vitro characterization of recombinant bacteria and its protectivity in animal model. *Microb Pathog*. 2020 Jan 8;141:103974. doi:10.1016/j.micpath.2020.103974. [Epub ahead of print] PubMed PMID: 31926238.

4: Madanchi H, **Khalaj V**, Jang S, Shabani AA, Ebrahimi Kiasari R, Seyed Mousavi SJ, Kazemi Sealani S, Sardari S. AurH1: a new heptapeptide derived from Aurein1.2 antimicrobial peptide with specific and exclusive fungicidal activity. *J PeptSci*. **2019** Jul;25(7):e3175. doi: 10.1002/psc.3175. Epub 2019 Jul 1. PubMed PMID: 31264322.

5: Azarian B, Azimi A, Sepehri M, Samimi Fam V, Rezaie F, Talebkhan Y, **Khalaj V**, Davami F. Proteomics investigation of molecular mechanisms affected by EnBase culture system in anti-VEGF fab fragment producing *E. coli* BL21 (DE3). *Prep Biochem Biotechnol*. 2019;49(1):48-57. doi:10.1080/10826068.2018.1508037. Epub **2019** Feb 8. PubMed PMID: 30735089.

6: Askari M, Bonakdar S, Anbouhi MH, Shahsavarani H, Kargozar S, **Khalaj V\***, Shokrgozar MA. Sustained release of TGF- $\beta$ 1 via genetically-modified cells induces the chondrogenic differentiation of mesenchymal stem cells encapsulated in alginate sulfate hydrogels. *J Mater Sci Mater Med*. **2018** Dec 29;30(1):7. doi:10.1007/s10856-018-6203-9. PubMed PMID: 30594964.

7: Azerang P, **Khalaj V**, Kobarfard F, Owlia P, Sardari S, Shahidi S. Molecular Characterization of a Fungus Producing Membrane Active Metabolite and Analysis of the Produced Secondary Metabolite. *Iran Biomed J*. 2019 Mar;23(2):121-8. Epub **2018** Sep 16. PubMed PMID: 30218995; PubMed Central PMCID: PMC6707112.

- 8: Farahmand M, Nahrevanian H, **Khalaj V**, Mohebali M, Barati M, Naderi S, Zarei Z, Khalili G. Assessment of Recombinant A2-Latex Agglutination Test (RA2-LAT) and RA2-ELISA for Detection of Canine Visceral Leishmaniasis: A Comparative Field Study with Direct Agglutination Test in Northwestern Iran. *Iran J Parasitol*. **2018** Apr-Jun;13(2):172-179. PubMed PMID: 30069200; PubMed Central PMCID: PMC6068373.
- 9: Bagherpour G, Ghasemi H, Zand B, Zarei N, Roohvand F, Ardakani EM, Azizi M, **Khalaj V\***. Oral Administration of Recombinant *Saccharomyces boulardii* Expressing Ovalbumin-CPE Fusion Protein Induces Antibody Response in Mice. *Front Microbiol*. **2018** Apr 13;9:723. doi: 10.3389/fmicb.2018.00723. eCollection 2018. PubMed PMID: 29706942; PubMed Central PMCID: PMC5908956.
- 10: Shafaie E, Saberi S, Esmacili M, Karimi Z, Najafi S, Tashakoripoor M, Abdirad A, Hosseini ME, Mohagheghi MA, **Khalaj V**, Mohammadi M. Multiplex serology of *Helicobacter pylori* antigens in detection of current infection and atrophic gastritis - A simple and cost-efficient method. *Microb Pathog*. 2018 Jun;119:137-144. doi: 10.1016/j.micpath.2018.04.018. Epub **2018** Apr 14. PubMed PMID: 29665437.
- 11: **Khalaj V**. SCIENTISTS and SCIENCE ADVOCATES: Professor David W. Denning, An Extraordinary High Achiever in Clinical and Translational Science. *Iran Biomed J*. 2018 Sep;22(5):290-1. Epub **2018** Feb 4. PubMed PMID: 29397044; PubMed Central PMCID: PMC6058189.
- 12: Nasiri M, Babaie J, Amiri S, Azimi E, Shamschiri S, **Khalaj V**, Golkar M, Fard-Esfahani P. SHuffle™ T7 strain is capable of producing high amount of recombinant human fibroblast growth factor-1 (rhFGF-1) with proper physicochemical and biological properties. *J Biotechnol*. **2017** Oct 10;259:30-38. doi: 10.1016/j.jbiotec.2017.08.015. Epub 2017 Aug 18. PubMed PMID: 28827102.
- 13: Agha Amiri S, Zarei N, Enayati S, Azizi M, **Khalaj V**, Shahhosseini S. Expression Optimization of Anti-CD22 scFv-Apoptin Fusion Protein Using Experimental Design Methodology. *Iran Biomed J*. 2018 Jan 1;22(1):66-9. Epub **2017** Jul 10. PubMed PMID: 28689385; PubMed Central PMCID: PMC5712387.
- 14: Agha Amiri S, Shahhosseini S, Zarei N, Khorasanizadeh D, Aminollahi E, Rezaie F, Zargari M, Azizi M, **Khalaj V\***. A novel anti-CD22 scFv-apoptin fusion protein induces apoptosis in malignant B-cells. *AMB Express*. 2017 Dec;7(1):112. doi:10.1186/s13568-017-0410-5. Epub **2017** Jun 2. PubMed PMID: 28582973; PubMed Central PMCID: PMC5457376.
- 15: Zarei N, **Khalaj V\***. Human-Yeast Hybrids: New Visions to Genetic Disorders and Drug Discovery. *Iran Biomed J*. **2017** Jul;21(4):205. Epub 2017 Jun 13. PubMed PMID: 28525953.
- 16: Rezaie F, Davami F, Mansouri K, Agha Amiri S, Fazel R, Mahdian R, Davoudi N, Enayati S, Azizi M, **Khalaj V\***. Cytosolic expression of functional Fab fragments in *Escherichia coli* using a novel combination of dual SUMO expression cassette and EnBase(®) cultivation mode. *J Appl Microbiol*. **2017** Jul;123(1):134-144. doi:10.1111/jam.13483. Epub 2017 Jun 9. PubMed PMID: 28482126.
- 17: Kargozar S, Hashemian SJ, Soleimani M, Milan PB, Askari M, **Khalaj V**, Samadikuchaksaraie A, Hamzehlou S, Katebi AR, Latifi N, Mozafari M, Baino F. Acceleration of bone regeneration in bioactive glass/gelatin composite scaffolds seeded with bone marrow-derived mesenchymal stem cells over-expressing bone morphogenetic protein-7. *Mater Sci Eng C Mater Biol Appl*. **2017** Jun 1;75:688-698. doi: 10.1016/j.msec.2017.02.097. Epub 2017 Feb 24. PubMed PMID: 28415516.

18: Torabi E, Behdani M, Chafi MH, Moazzami R, Sabatier JM, **Khalaj V**, Shahbazzadeh D, Bagheri KP. Characteristics and Lethality of a Novel Recombinant Dermonecrotic Venom Phospholipase D from *Hemiscorpius lepturus*. *Toxins (Basel)*. **2017** Mar 13;9(3). pii: E102. doi: 10.3390/toxins9030102. PubMed PMID: 28335389; PubMed Central PMCID: PMC5371857.

19: Nematpour F, Mahboudi F, Vaziri B, **Khalaj V**, Ahmadi S, Ahmadi M, Ebadat S, Davami F. Evaluating the expression profile and stability of different UCOE containing vector combinations in mAb-producing CHO cells. *BMC Biotechnol*. **2017** Feb 22;17(1):18. doi: 10.1186/s12896-017-0330-0. PubMed PMID: 28228095; PubMed Central PMCID: PMC5322649.

20: Torabi E, Asgari S, **Khalaj V**, Behdani M, Kazemi-Lomedasht F, Bagheri KP, Shahbazzadeh D. Corrigendum to "The first report on transcriptome analysis of the venom gland of Iranian scorpion, *Hemiscorpius lepturus*" [*Toxicon* 125 (2017) 123-130]. *Toxicon*. 2017 Mar 15;128:60. doi: 10.1016/j.toxicon.2017.01.012. Epub 2017 Feb 10. PubMed PMID: 28192687.

21: Malekzadeh S, Sardari S, Azerang P, Khorasanizadeh D, Agha Amiri S, Azizi M, Mohajerani N, **Khalaj V**\*. Identification and Evaluation of Novel Drug Targets against the Human Fungal Pathogen *Aspergillus fumigatus* with Elaboration on the Possible Role of RNA-Binding Protein. *Iran Biomed J*. **2017** Mar;21(2):84-93. Epub 2016 Dec 21. PubMed PMID: 28000798; PubMed Central PMCID: PMC5274715.

22: Kazemi-Lomedasht F, **Khalaj V**, Bagheri KP, Behdani M, Shahbazzadeh D. The first report on transcriptome analysis of the venom gland of Iranian scorpion, *Hemiscorpius lepturus*. *Toxicon*. 2017 Jan;125:123-130. doi: 10.1016/j.toxicon.2016.11.261. Epub **2016** Nov 30. Erratum in: *Toxicon*. 2017 Mar 15;128:60. PubMed PMID: 27914888.

23: Oghalaie A, Saberi S, Esmaceli M, Ebrahimzadeh F, Barkhordari F, Ghamarian A, Tashakoripoor M, Abdirad A, Eshagh Hosseini M, **Khalaj V**, Mohammadi M. *Helicobacter pylori* Peptidyl Prolyl Isomerase Expression Is Associated with the Severity of Gastritis. *J Gastrointest Cancer*. **2016** Dec;47(4):375-380. PubMed PMID: 27370181.

24: Talebkhan Y, Samadi T, Samie A, Barkhordari F, Azizi M, **Khalaj V**, Mirabzadeh E. Expression of granulocyte colony stimulating factor (GCSF) in *Hansenula polymorpha*. *Iran J Microbiol*. **2016** Feb;8(1):21-8. PubMed PMID: 27092221; PubMed Central PMCID: PMC4833737.

25: Enayati S, Azizi M, Aminollahi E, Ranjvar Shahrivar M, **Khalaj V**\*. T7-RNA polymerase dependent RNAi system in *Aspergillus fumigatus*: a proof of concept study. *FEMS Microbiol Lett*. **2016** Mar;363(5):fnw029. doi: 10.1093/femsle/fnw029. Epub 2016 Feb 5. PubMed PMID: 26850443.

26: Khalaj K, Aminollahi E, Bordbar A, **Khalaj V**\*. Fungal annexins: a mini review. *Springerplus*. 2015 Nov 24;4:721. doi: 10.1186/s40064-015-1519-0. eCollection **2015**. Review. PubMed PMID: 26636009; PubMed Central PMCID: PMC4656261.

27: Farahmand M, **Khalaj V**, Mohebbali M, Khalili G, Naderi S, Ghaffarinejad P, Nahrevanian H. Comparison of recombinant A2-ELISA with rKE16 dipstick and direct agglutination tests for diagnosis of visceral leishmaniasis in dogs in Northwestern Iran. *Rev Soc Bras Med Trop*. **2015** Mar-Apr;48(2):188-93. doi: 10.1590/0037-8682-0285-2014. PubMed PMID: 25992934.

- 28: Jahandar H, Vaziri B, Nematollahi L, Afsharirad T, Mirabzadeh E, Torkashvand F, **Khalaj V\***. Effect of Cysteamine on Cell Growth and IgG4 Production in Recombinant Sp2.0 Cells. *Iran J Pharm Res.* **2015** Winter;14(1):177-87. PubMed PMID: 25561924; PubMed Central PMCID: PMC4277631.
- 29: Kazemali M, Majidzadeh-A K, Sardari S, Saadati AH, **Khalaj V**, Zarei N, Barkhordari F, Adeli A, Mahboudi F. Design of a novel chimeric tissue plasminogen activator with favorable Vampire bat plasminogen activator properties. *Enzyme Microb Technol.* 2014 Dec;67:82-6. doi: 10.1016/j.enzmictec.2014.09.005. Epub **2014** Sep 22. PubMed PMID: 25442953.
- 30: Shargh SA, Sakizli M, **Khalaj V**, Movafagh A, Yazdi H, Hagigatjou E, Sayad A, Mansouri N, Mortazavi-Tabatabaei SA, Khorram Khorshid HR. Downregulation of E-cadherin expression in breast cancer by promoter hypermethylation and its relation with progression and prognosis of tumor. *Med Oncol.* **2014** Nov;31(11):250. doi: 10.1007/s12032-014-0250-y. Epub 2014 Sep 27. PubMed PMID: 25260805.
- 31: Zarei N, Vaziri B, Shokrgozar MA, Mahdian R, Fazel R, **Khalaj V\***. High efficient expression of a functional humanized single-chain variable fragment (scFv) antibody against CD22 in *Pichia pastoris*. *Appl Microbiol Biotechnol.* 2014 Dec;98(24):10023-39. doi: 10.1007/s00253-014-6071-2. Epub **2014** Sep 21. PubMed PMID: 25239038.
- 32: Fazel R, Zarei N, Ghaemi N, Namvaran MM, Enayati S, Mirabzadeh Ardakani E, Azizi M, **Khalaj V\***. Cloning and expression of *Aspergillus flavus* urate oxidase in *Pichia pastoris*. *Springerplus.* 2014 Jul 30;3:395. doi: 10.1186/2193-1801-3-395. eCollection **2014**. PubMed PMID: 25105091; PubMed Central PMCID: PMC4124111.
- 33: Katirae F, **Khalaj V**, Khosravi AR, Hajiabdolbaghi M. Sequences type analysis of *Candida albicans* isolates from Iranian human immunodeficiency virus infected patients with oral candidiasis. *Acta Med Iran.* **2014**;52(3):187-91. PubMed PMID: 24901719.
- 34: Yahyaraeyat R, Khosravi AR, Shahbazzadeh D, **Khalaj V**. The potential effects of *Zataria multiflora* Boiss essential oil on growth, aflatoxin production and transcription of aflatoxin biosynthesis pathway genes of toxigenic *Aspergillus parasiticus*. *Braz J Microbiol.* **2013** Oct 30;44(2):643-9. doi: 10.1590/S1517-83822013000200045. eCollection 2013. PubMed PMID: 24294264; PubMed Central PMCID: PMC3833170.
- 35: Farahtaj F, Zandi F, **Khalaj V**, Biglari P, Fayaz A, Vaziri B. Proteomics analysis of human brain tissue infected by street rabies virus. *Mol Biol Rep.* 2013 Nov;40(11):6443-50. doi: 10.1007/s11033-013-2759-0. Epub **2013** Sep 24. PubMed PMID: 24057270.
- 36: Nematollahi L, Mahboudi F, Rahimpour A, Jahandar H, **Khalaj V\***. [A novel human bone morphogenetic protein-7 variant with an enriched heparin-binding site]. *Mol Biol (Mosk).* 2013 May-Jun;47(3):453-60. **2014** Nov-Dec;48(6):1035. PubMed PMID: 23888776.
- 37: Moradi S, Azerang P, **Khalaj V**, Sardari S. Antifungal indole and pyrrolidine-2,4-Dione derivative peptidomimetic lead design based on in silico study of bioactive Peptide families. *Avicenna J Med Biotechnol.* **2013** Jan;5(1):42-53. PubMed PMID: 23626876; PubMed Central PMCID: PMC3572706.

38: Azizi M, Yakhchali B, Ghamarian A, Enayati S, Khodabandeh M, **Khalaj V\***. Cloning and Expression of Gumboro VP2 Antigen in *Aspergillus niger*. *Avicenna J Med Biotechnol.* **2013** Jan;5(1):35-41. PubMed PMID: 23626875; PubMed Central PMCID: PMC3572705.

39: Hamed H, Misaghi A, Modarressi MH, Salehi TZ, Khorasanizadeh D, **Khalaj V\***. Generation of a Uracil Auxotroph Strain of the Probiotic Yeast *Saccharomyces boulardii* as a Host for the Recombinant Protein Production. *Avicenna J Med Biotechnol.* **2013** Jan;5(1):29-34. PubMed PMID: 23626874; PubMed Central PMCID: PMC3572704.

40: Nematollahi L, **Khalaj V**, Babazadeh SM, Rahimpour A, Jahandar H, Davami F, Mahboudi F. Periplasmic Expression of a Novel Human Bone Morphogenetic Protein-7 Mutant in *Escherichia coli*. *Avicenna J Med Biotechnol.* **2012** Oct;4(4):178-85. PubMed PMID: 23407680; PubMed Central PMCID: PMC3558220.

41: Zandi F, Eslami N, Torkashvand F, Fayaz A, **Khalaj V**, Vaziri B. Expression changes of cytoskeletal associated proteins in proteomic profiling of neuroblastoma cells infected with different strains of rabies virus. *J Med Virol.* **2013** Feb;85(2):336-47. doi: 10.1002/jmv.23458. Epub 2012 Nov 20. PubMed PMID: 23168799.

42: Mahmoudzadeh-Niknam H, Abrishami F, Doroudian M, Moradi M, Alimohammadian M, Parvizi P, Hatam G, Mohebbi M, **Khalaj V**. The Problem of Mixing up of *Leishmania* Isolates in the Laboratory: Suggestion of ITS1 Gene Sequencing for Verification of Species. *Iran J Parasitol.* **2011** Mar;6(1):41-8. PubMed PMID: 22347273; PubMed Central PMCID: PMC3279869.

43: **Khalaj V\***, Azizi M, Enayati S, Khorasanizadeh D, Ardakani EM. NCE102 homologue in *Aspergillus fumigatus* is required for normal sporulation, not hyphal growth or pathogenesis. *FEMS Microbiol Lett.* **2012** Apr;329(2):138-45. doi: 10.1111/j.1574-6968.2012.02513.x. Epub 2012 Feb 13. PubMed PMID: 22289033.

44: **Khalaj V\***, Azarian B, Enayati S, Vaziri B. Annexin C4 in *A. fumigatus*: a proteomics approach to understand the function. *J Proteomics.* 2011 Sep 6;74(10):1950-8. doi: 10.1016/j.jprot.2011.05.018. Epub **2011** May 27. PubMed PMID: 21640208.

45: Majidzadeh-A K, Mahboudi F, Hemayatkar M, Davami F, Barkhordary F, Adeli A, Soleimani M, Davoudi N, **Khalaj V\***. Human Tissue Plasminogen Activator Expression in *Escherichia coli* using Cytoplasmic and Periplasmic Cumulative Power. *Avicenna J Med Biotechnol.* **2010** Jul;2(3):131-6. PubMed PMID: 23408156; PubMed Central PMCID: PMC3558155.

46: Majidzadeh-A K, **Khalaj V**, Fatemeh D, Mahdi H, Farzaneh B, Ahmad A, Mahboudi F. Cloning and expression of functional full-length human tissue plasminogen activator in *Pichia pastoris*. *Appl Biochem Biotechnol.* 2010 Nov;162(7):2037-48. doi: 10.1007/s12010-010-8979-z. Epub **2010** May 9. PubMed PMID: 20455033.

47: **Khalaj V\***, Eslami H, Azizi M, Rovira-Graells N, Bromley M. Efficient downregulation of *alb1* gene using an AMA1-based episomal expression of RNAi construct in *Aspergillus fumigatus*. *FEMS Microbiol Lett.* **2007** May;270(2):250-4. Epub 2007 Mar 2. PubMed PMID: 17343676.

48: **Khalaj V**, Hey P, Smith L, Robson GD, Brookman J. The *Aspergillus niger* annexin, anxC3.1 is constitutively expressed and is not essential for protein secretion. *FEMS Microbiol Lett.* **2004** Oct 1;239(1):163-9. PubMed PMID: 15451115.

49: **Khalaj V**, Smith L, Brookman J, Tuckwell D. Identification of a novel class of annexin genes. *FEBS Lett.* **2004** Mar 26;562(1-3):79-86. PubMed PMID: 15044005.

50: **Khalaj V**, Brookman JL, Robson GD. A study of the protein secretory pathway of *Aspergillus niger* using a glucoamylase-GFP fusion protein. *Fungal Genet Biol.* **2001** Feb;32(1):55-65. PubMed PMID: 11277626.

51: Gordon CL, **Khalaj V**, Ram AFJ, Archer DB, Brookman JL, Trinci APJ, Jeenes DJ, Doonan JH, Wells B, Punt PJ, van den Hondel CAMJJ, Robson GD. Glucoamylase::green fluorescent protein fusions to monitor protein secretion in *Aspergillus niger*. *Microbiology.* **2000** Feb;146 ( Pt 2):415-426. doi: 10.1099/00221287-146-2-415. PubMed PMID: 10708380.

### **U.S. PATENT**

Aliphatic amino acid biosynthesis inhibitors and a method of synthesizing the same (US 8569361 B1)