

Name: Zahra Aminibayat

Date of birth: 1980

Nationality: Iranian

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### **Present position:**

Assistant professor in Department of Biotechnology, Iranian Research Organization for Science and Technology, Tehran, Iran (2013-present)

### **Educations**

- 1994-1998**      **High School** student majoring in BioSciences in Farzanegan High School in tehran, Iran. This school is under the supervision of the **NODET**- national Organization for Development of Exceptional Talents.
- 1998-2002**      Student of **B.Sc. in Molecular Cell Biology** at Department of Biology, Faculty of Science, University of Tehran.
- 2003-2006**      Student of **M.Sc. in Biochemistry** at Department of Biology, Faculty of Science, TarbiatModares University, Tehran, Iran. My Thesis research was “**Designing of chemiluminescence- enzyme immunoassay method for determination of aflatoxin-B1**”.
- 2006-2011**      Student of **Ph.D. in Biochemistry** at Department of Biology, Faculty of Science, TarbiatModares University, Tehran, Iran. My thesis research was “**The study of thermostability of modified firefly luciferase due to saturation and site-directed mutagenesis**”.

### **Research interests:**

- Protein engineering
- Recombinant protein (enzyme, vaccine, hormone) production in different host such as

- *E. Coli*, plant, chlamydomonas reinhardtii, mammalian cells, leishmania tarentolae.
- Protein structure and evolution
- Directed evolution of enzymes and proteins
- Biosensors
- Design, expression and evaluation of vaccines
- Engineering of endolysins to combat antibiotic resistant bacteria

### Teaching experiences:

**Bioseparation** course, PhD students

**Genetic engineering** course, MSc students

**Protein engineering** course, MSc students

**Bioinformatic** course, MSc students

**Advanced genetic engineering**, PhD students

Application of **genetic engineering** in microbiology, PhD students

**Biochemistry lab2**, BSc students

**General biochemistry lab**, BSc students

**Ecology** course, BSc students

**Immunoassay** workshop

### Research experiences:

#### Previous projects:

1. Design and production of a biosensor for detection of caspase 3/7 activity. Cheraghi, R., **Aminibayat , Z.**, Hosseinkhani , S., TarbiatModares University, Tehran, Iran.
2. Protein engineering using site-directed and site-saturation mutagenesis for increasing luciferase thermostability. **Aminibayat , Z.**, Hosseinkhani , S., TarbiatModares University, Tehran, Iran.
3. Design and production of chemiluminescence ELISA kit for HCV diagnostic. **Aminibayat , Z.**, Hosseinkhani , S., bayanolhagh, S., DynaBioTech Company, Tehran, Iran.
4. Design and set up of chemiluminescence- enzyme immunoassay method for determination of aflatoxin-B1. **Aminibayat , Z.**, Hosseinkhani , S., bayanolhagh, S., DynaBioTech Company, Tehran, Iran.
5. Design and production of chemiluminescence ELISA kit for HBV diagnostic. **Aminibayat , Z.**, Hosseinkhani , S., bayanolhagh, S., DynaBioTech Company, Tehran, Iran.
6. Set up of HCG assay kit. **Aminibayat , Z.**, Moghimi, S., bayanolhagh, S. samantajhiznoor

company

7. Set up of T3 and T4 assay kit. **Aminibayat, Z.**, Moghimi, S., bayanolhagh, S.
8. Collaboration in “production of recombinant nerve growth factor (NGF) in plant” project. Ofoghi, H., Aminibayat, Z.
9. Collaboration in “ production of recombinant human calcitonin in *chlamydomonas reinhardtii*” project. Ofoghi, H., Aminibayat, Z.
10. Executive of “Cloning, expression and purification of creatinase enzyme” project.
11. Executive of “production of recombinant Creatininase enzyme in E.Coli” project.
12. Executive of “Cloning, expression and purification of sarcosine oxidase enzyme” project.
13. Executive of " investigation of recombinant human Follicle-stimulating hormone (FSH) production in *leishmania tarentolae* "
14. Collaboration in " Design, cloning and expression of recombinant pharmaceutical triparatide peptide in E.Coli" project.
15. Collaboration in “Optimization of Teriparatide recombinant fusion protein expression in *E.coli* in fermenter” project.

Current projects:

1. Executive of “ Evaluation efficiency of immunogenic epitopes of the E6 and E7 antigens of human papillomavirus type 16 as a therapeutic vaccine in the experimental model of tumor induced by transgenic TC-1 line”
2. Executive of “Investigating the effect of foreign helper antigen on the immune response rate against polyepitopic HPV16 E6 vaccine”

Publication:

Book:

روش های تولید پروتئین محلول. نویسندگان: دکتر زهرا امینی بیات، شبنم شمع ریز. نوبت چاپ 94

Papers:

S. Kakhki, A. Arabgari, Z. Amini-Bayat\*, B. Kazemi, Leishmania as an Expression System for the Human Follicle-Stimulating Hormone. Iranian Journal of Science and Technology, Transactions A: Science, 2019, Volume OnlineFirst – Aug 28

M. Zangi, Z. Amini-Bayat, P. Ehsani, H. Ofoghi\*, Replication of pgR107 binary Ti vector without pSoup helper plasmid in disarmed *Agrobacterium tumefaciens* LBA4404. *Health Biotechnology and Biopharma*, 2019, 3(1): 19-28.

S. Abbaszadeh, N. Bakhtiari, Z. Amini-Bayat, Simple and Effective purification of Recombinant Peptide Drug, hPTH (1-34), Expressed in *E. coli* Host, *International Journal of Peptide Research and Therapeutics*, 2019, 25 (2), 419-425.

Z. Amini-Bayat\*, N. Bakhtiari, Cloning, Expression and Purification of Creatininase From *Pseudomonas Pseudoalkaligene KF707* in *E. coli*. *Biomacromolecular journal*, 2017, 3(1), 75-82.

S. Abbaszadeh, N. bakhtiari\*, **Z. Amini Bayat**, Effective solubilization and purification of recombinant teriparatide fusion protein expressed in *E. coli*, *Modares Journal of Biotechnology*, 2019, 10 (1), 1-7.

H. Naghoosi, H. Ofoghi\*, N. Moazami and **Z. Amini-bayat**, A Modified Colony PCR Method for Screening Recombinant *Chlamydomonas reinhardtii*, *International Journal of Advanced Biotechnology and Research*, 2017, 8, 992-995.

H. Naghoosi, H. Ofoghi\*, N. Moazami and **Z. Amini-bayat**, Secretary expression of recombinant human calcitonin in microalgae *Chlamydomonas reinhardtii*, *modares journal of biotechnology*, 2019, 10(1): 29-35.

E. Afshari, **Z. Amini-bayat\***, S. hosseinkhani, N. Bakhtiari Cloning, expression and purification of *pseudomonas putida ATCC12633* Creatinase. *Avicenna Journal of Medical Biotechnology*. 2017, 9, 169-175.

M. Ghanbari Motlagh, **Z. Amini-Bayat\***, H. Ofoghi\*, Investigation of an optimized context for expression of GFP as a model protein in *Chlamydomonas Reinhardtii*, *Biomacromolecular journal*, 2016, 2, 135-142.

M. Zangi, H. Ofoghi\*, **Z. Amini-Bayat** and P. Ehsani. Utility of P19 Gene-Silencing Suppressor for High Level Expression of Recombinant Human Therapeutic Proteins in Plant Cells. *Research in Molecular Medicine*. 2016, 4 (3), 35-40.

S. Shamriz; H. Ofoghi; **Z. Amini-Bayat**, Soluble Expression of Recombinant Nerve Growth Factor in Cytoplasm of *E. coli*, *Iranian journal of biotechnology*. 14 (1), 2016, 16-22 . DOI: [10.15171/ijb.1331](https://doi.org/10.15171/ijb.1331).

N. Bakhtiari \*, **Z. Amini-Bayat**, S. sagharidouz, and M. Vaez. Overexpression of Recombinant Human Teriparatide, rhPTH (1-34) in *Escherichia coli* (*E. coli*) : an Innovative Gene Fusion Approach, *Avicenna Journal of Medical Biotechnology*. 9(1), 2017, 19-22.

**Z. Amini-Bayat**, S. Hosseinkhani\*, R. Jafari, K. Khajeh, Relationship between stability and flexibility in the most flexible region of *Photinus pyralis* luciferase, *Biochimica et Biophysica Acta* 1824 (2012) 350–358.

R. Cheraghi, S. Hosseinkhani\*, J. Davoodi, M. Nazari, **Z. Amini-Bayat**, H. Karimi, M. Shamseddin, F. Gheidari, Structural and functional effects of circular permutation on firefly luciferase: Invitro assay of caspase3/7, *International Journal of Biological Macromolecules*, 2013, 58, 336– 342.

**Z. Aminibayat\***, M. Nazari, S. Hosseinkhani, The effect of amino acid substitution of pro 473 on thermostability and structural properties of firefly luciferase, *JICS*, 10th Iranian Congress of Biochemistry & 3rd International Congress of Biochemistry and Molecular Biology proceeding, S93.

M. Nazari\*, S. Hosseinkhani, **Z. Aminibayat**, Random mutagenesis for protein breeding of firefly luciferase, *JICS*, 10th Iranian Congress of Biochemistry & 3rd International Congress of Biochemistry and Molecular Biology proceeding, S168.

R. Cheraghi, S. Hosseinkhani\*, J. Davoodi, **Z. Aminibayat**, Circular permuted luciferase, *JICS*, 9th Iran Biophysical Chemistry Conference, A44-45.

#### Conference presentation and posters:

“The effect of E6 toxic protein expression in the growth rate of three strains of *E.coli*” , The 2<sup>th</sup> international congress of biomedicine, Iran, Tehran, 2018.

“Optimization of Recombinant HPV 16-E6 Protein Expression in *E. coli*”, The 4<sup>th</sup> international biotechnology congress, Iran, Tehran, 2019.

"Development of Aflatoxin B1 measurement by Chemiluminescence enzyme immunoassay"  
The 4<sup>th</sup> national biotechnology congress, Islamic Republic of Iran , Kerman, Aug 2005

"Development of a chemiluminescence-ELISA assay for the detection of antibodies against

HCV antigens"

The 5<sup>th</sup> national biotechnology congress, Islamic Republic of Iran, Tehran , 2007

“The effect of amino acid substitution of proline473 on thermostability and structural properties of firefly luciferase”

The 10<sup>th</sup> national biochemistry congress and 3<sup>th</sup> international biochemistry and molecular biology congress, Islamic Republic of Iran, Tehran university , 2009

“Random mutagenesis for protein breeding of firefly luciferase”

The 10<sup>th</sup> national biochemistry congress and 3<sup>th</sup> international biochemistry and molecular biology congress, Islamic Republic of Iran , Tehran university , 2009

“Circular permuted luciferase“

The 9<sup>th</sup> biochemistry and biophysics congress, Islamic Republic of Iran, Tehran, TarbiatModares University.

“ the effect of mutagenesis of amino acids with different B-factor on luciferase thermostability”

The 16<sup>th</sup> national and 4<sup>th</sup> international biology conference, Islamic Republic of Iran, Mashhad, 2010.

Participation in The 1<sup>th</sup> international molecular thechnology conference with collaboration of the international cell death society, Iran, Tehran,shahid beheshti university.

“*In-silico* modification of *clamydomonas reinhardtii* signal peptide for optimized heterologous expression/ secretion”

The 5<sup>th</sup> bioinformatic congress, Iran, Tehran university, IBB.

"Cloning of recombinant nerve growth factor in PVX viral vector"

First International and 13th Iranian Genetics Congress, Iran, Tehran, Shahid Beheshti University.

"Cloning and expression of nerve growth factor in *E.Coli*"

First International and 13th Iranian Genetics Congress, Iran, Tehran, Shahid Beheshti University.

"Design and synthesis of recombinant human calcitonin expression construct in *chlamydomonas reinhardtii microalgae*"

First International and 13th Iranian Genetics Congress, Iran, Tehran, Shahid Beheshti University.

"Cloning and transformation of GFP gene into nucleus of *chlamydomonas reinhardtii*"

First International and 13th Iranian Genetics Congress, Iran, Tehran, Shahid Beheshti University.

## HONORS AND AWARDS

**1998** Ranked **368<sup>th</sup>** in the Iranian National Universities Entrance Exam among almost 400,000 participants in Biosciences Major.

## SKILLS

**Basic computer skills:** Windows, Microsoft Word, Powerpoint , excel, Photoshop, ....

**Biochemistry techniques:** chromatography, Gel filtration, Ion exchange chromatography, affinity chromatography, chromatofocusing, two dimensional electrophoresis, conjugation processes, protein electrophoresis, protein stabilization, protein determination with different approach of coomassie blue, silver nitrate staining and other approach, determination of enzyme kinetic parameters ( $K_m$ ,  $V_{max}$ ,...), protein structure analysis (fluorescence, circular dichroism,...), protein refolding, protein interaction analysis, western blot.

**Sequence Analysis Softwares:** Vector NTI software, DNASTAR package, primer design, gene optimization for increasing protein expression (LETO,...)

**Molecular biology techniques:** different types of PCR techniques (SOE PCR...), Gel electrophoresis of DNA, DNA extraction from different cell types, cloning, transformation, protein expression( all step needed for recombinant protein production), Site-directed and site-saturation mutagenesis, library screening.

**Bioinformaticsoftwares:** Different databases of protein and nucleic acid, spdbv (swisspdb viewer), DS visualiser ,homology modeling,protein stability prediction, protein flexibility investigation , BLAST,....

**Immunology techniques:** set up ELISA and Chemiluminescence ELISA tests (optimizing all condition (Ab and Antigen concentration, blocking, standard solution preparation ,...), Immunoprecipitation, Dot blotting, western blotting.

**Supervisor and advisor** of MSc and PhD students in biotechnology, biochemistry and microbiology fields.

OTHER INFORMATION:

Submit gene to genbank database.

Set up of biochemistry lab in Islamic Azad University of pharmaceutical sciences.