

Dr. Ghassem Amoabediny

- **Associate Professor**, Biotechnology and Environment Group, Faculty of Chemical Engineering, School of Engineering
- Dean, Faculty of New Science and Technology
- Dean, Research Center for New Technologies in Life Science Engineering, University of Tehran,

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Education

- **Ph.D. (Second):** Post-graduate Nanobiotechnology at TU- Kaiserslautern- Germany. 2007
- **Ph.D.:** Ph.D in Biochemical Engineering at RWTH-Aachen University - Germany, 2002-2006
- **M.Sc.:** Master of Science (Engineering) in Chemical Engineering at University of Tehran, 1994-1996
- **B.Sc.:** Bachelor of Science in Chemical Engineering at University of Tehran, 1990-1994, (First Rank)

Positions Held (now)

- Associate professor of Biochemical, Biomedical and NanoBioEngineering
- Director of Research Center for new technologies in Life Science Engineering
- Head of Department of NanoBiotechnology
- Dean of Faculty of New Science and Technology at University of Tehran

Area of Interests

- Nanobiotechnology and Nanodrugs,
- Pharmaceutical Engineering
- Biomedical Engineering,
- Tissue Engineering and Artificial Organs
- Small Scale Culture Technology,

- Bioreactor Technology, Scale up/down in the Fermentation Process,
- Enzyme Technology,
- Environmental biotechnology

Journal Papers

1. Faridi-Majidi R., Madani M., Sharifi-Sanjani N., Amoabediny Gh. Cobalt hydroxide-polyethylene oxide composite nanofibers via electrospinning. Submitted to *e-Polymers*. 2012.
2. Madani M., Amoabediny Gh., Sharifi-Sanjani N., Hasan-Kaviar A. PS-TiO₂ composite nanofibers with higher surface to volume ratio prepared by electrospinning: Morphology and thermal properties. Submitted to *Polymer engineering and science*. 2012.
3. Osouli Tabrizi H., Amoabediny Gh., Moshiri B., Pesaran Haji Abbas M., Pouran B., Imenipour E., Rashedi H., Büchs J. (2011) Novel dynamic model for aerated shaking bioreactors, *Biotechnology and Applied Biochemistry*, 58 (2) 128–137.
4. **Amoabediny Gh.**, Büchs J. (2010) Determination of CO₂ sensitivity of microorganisms in shaken bioreactors partI: novel method based on the resistance of sterile closure, *Biotechnology and Applied Biochemistry*, 57, 157–166.
5. **Amoabediny Gh.**, Pesaran Haji Abbas M, Büchs J.(2010) Determination of CO₂ sensitivity of microorganisms in shaken bioreactor, Part II: Novel online monitoring method, *Biotechnology and Applied Biochemistry*, 57, 167–175.
6. Chamanrokh P., Mazaheri Assadi M., **Amoabediny Gh.**, Rashedi H. (2010) Cleaning oil-contaminated vessel by emulsan producers (Autochthonous bacteria), *Iran. J. Environ. Health. Sci. Eng.*, 7, 209-222.
7. **Amoabediny Gh.**, Rezvani M., Rashedi H., Jokari S., Chamanrokh P., Mazaheri M., Ghavami M., Yazdian F. (2010) Application of a novel method for optimization of bioemulsan production in a miniaturized bioreactor, *Bioresource Technology*, 10,1 9758-9764.
8. Osouli Tabrizi H., **Amoabediny Gh.**, Moshiri B., Adhami A., Pesaran Haji Abbas M., Imenipour E. (2010) Sliding mode control of an anaerobic upflow fixed bed bioreactor, *Journal of Biotechnology*, 150, S 1, 227-228.
9. Arabian Hossein Abadi H., Rashedi H., **Amoabediny Gh.**, Mazaheri Asadi M. (2009) Purification of rhamnolipid using colloidal magnetic nanoparticles. *African Journal of Biotechnology*, 8, 3097-3106.

10. Tabesh H., **Amoabediny Gh.**, Salehi Nik N., Heydari M., Yosefifard M., Ranaei Siadat S.O., Mottaghy K. (2009) The role of biodegradable engineered scaffolds seeded with Schwann cells for spinal cord regeneration, *Neurochemistry International*, 54, 73-83.
11. **Amoabediny Gh.**, Ziaie-Shirkolaei Y., Buchs J. (2009) Development of an unsteady-state model for a biological system in miniaturized bioreactors, *Biotechnology and Applied Biochemistry* 54, 163-170.
12. Rashedi H., **Amoabediny Gh.**, Eskandari S., Chamanrokh P., Ziaie-Shirkolaei Y. (2008) Application of a commercial lipase enzyme on biobleaching of kraft bagasse pulp, *Cellulose Chemistry and Technology*, 42, 397-402.
13. Bäumchen C., Knoll A., Husemann B., Seletzky J., Maier B., Dietrich C., **Amoabediny Gh.**, Büchs J. (2007) Effect of elevated dissolved carbon dioxide concentrations on growth of *Corynebacterium glutamicum* on D-glucose and L-lactate, *Journal of Biotechnology*, 128, 868-874.
14. **Amoabediny Gh.**, Buchs J. (2007) Modelling and advanced understanding of unsteady-state gas transfer in shaking bioreactors, *Biotechnology and Applied Biochemistry* 46, 57-67.
15. Seletzky J. M., Noack U., Hahn S., Knoll A., **Amoabediny Gh.**, Buchs J. (2007) An experimental comparison of respiration measuring techniques in fermenters and shake flasks: exhaust gas analyzer vs. RAMOS device vs. respirometer. *J. Ind. Microbiol Biotechnol.* 34, 123-30.
16. Anderlei T., Mrotzek C., Bartsch, S., **Amoabediny, Gh.**, Peter, C.P., Büchs, J. (2007) New method to determine the mass transfer resistance of sterile closures for shaken bioreactors, *Biotechnology and bioengineering*, 98, 999-1007
17. **Amoabediny Gh.**, Naderi A., Malakootikhah J., Koohi M. K., Mortazavi S. A., Naderi M., Rashedi H. (2009) Guidelines for safe handling, use and disposal of nanoparticles . *Journal of physics*.

Conference Papers

1. Study on equation on Kinetic in Pyrite by Bacterial leaching for Gold recovery, Fifth national congress on Chem Eng, Shiraz, Iran, 2000.
2. Nanobiotechnology a new conception in industry and life science, Congress of Nanotechnology the next industrial revolution, Tehran, Iran, 2002.
3. A novel and easy method for quantification of CO₂ sensitivity of microorganism in shaken bioreactors, Chemie ingenieur technik, Aachen, Germany, 2006.

4. Batch and fed-batch cultures of *Bacillus thuringiensis* H14 for producing s biological insecticide, International symposium on clean energy technology, Shanghai, China, 2007.
5. A new aeration strategy to scale up from shaken flasks to stirred tank bioreactors based on the effect of CO₂ ventilation, 6th European symposium on biochemical engineering science, Slazburg, Austria, 2008.
6. Nanotechnology in therapeutic sciences Possible risks and benefits, International Congress of veterinary pharmacology pharmaceutical Sciences, Tehran, Iran, 2008.
7. Magneto-liposome Nanoparticles Fabrication Using Soybean Lecithin for Protein Separation, ICNN 2008, Tabriz, Iran, 2008.
8. A new strategy for aeration from shake flask to aerated flask, The Second International Student Conference of Biotechnology, Tehran, Iran, 2008.
9. Concepts and application of enzymatic membrane bioreactors, The Second International Student Conference of Biotechnology, Tehran, Iran, 2008.
10. A review on the role of engineered parameters in bioreactors used for 3D tissue constructions, The Second International Student Conference of Biotechnology, Tehran, Iran, 2008.
11. The importance of disposable bioreactors in cells proliferation, The Second International Student Conference of Biotechnology, Tehran, Iran, 2008.
12. Adsorption of Ni ions from industrial wastewater by magnetite iron oxide nanoparticles, Environmental managment and technologies towards sustainable development, Penang, Malaysia, 2008.
13. Engineering Nanofibrous Scaffolds for Spinal Cord Regeneretion, Nano and Nano Medicine, Mashad, Iran, 2009.
14. The Potential of three Indigenous Isolated Bactria for Production of Biosurfactant and application in EOR, 8th World congress of chemiocal engineering, Montreal, Canada, 2009.
15. Medium optimization for biosurfactant production from bacillus subtilis in ventilation flask, 8th World congress of chemiocal engineering, Montreal, Canada, 2009.
16. Adsorption of Ni (II) ions from industrial wastewater by magnetic nanoparticles, AWTR 2009, Tehran, Iran.
17. The elimination of biologic problems due contaminants in wastewater by biosurfactant, AWTR 2009, Tehran, Iran.

18. Study of removal Pb from industry waste water by magnetic iron nanoparticles, AWTR 2009, Tehran, Iran.
19. Several aspects of environment protection: from hazardous industrial wastewater (whey) to green products, AWTR 2009, Tehran, Iran.
20. Purification of product emulsion using Bacillus subtitles Bactria by Iron magnetic Nanoparticles biofunctional for oil waste water treatment, AWTR 2009, Tehran, Iran.
21. Protein separaion using biofunctional magnetic nanoparticles, AWTR 2009, Tehran, Iran.
22. Preparation and stabilization methods of liposomes as drug carriers, The 6th International chemical engineering congress Exhibition, Kish, Iran, 2009.
23. Use of computerized simulation of engineering parameters in tissue-engineering bioreactors, 3rd International congress biotechnologies for spinal surgery, Amsterdam, Netherlands, 2010.
24. Sliding mode control of anaerobic upflow fixed bed bioreactor, 14th international biotechnology symposium and exhibition, Rimini, Italy, 2010
25. CuFe₂O₄ electrospun nanofibers application for removal of Ni in water, IWA regional conference and exhibition on membrane technology and water reuse, Istanbul, Turkey, 2010.
26. A comprehensive model to calculate the pressure drop in the liquid phase of a hollow oxygenator, 13th Aachener membrane kalloquium, Aachen, Germany, 2010.
27. Fabrication of hybrid electrospun fibers composed of gelatin and PCL polymers, 7th International Chemical Engineering Congress and Exhibition (IChEC 2011).
28. Improvement of operating conditions for preparation of gelatin electrospun fibers used in tissue engineering, 7th International Chemical Engineering Congress and Exhibition (IChEC 2011).
29. Hybrid electrospun fibers composed of gelatin and PCL polymers, PPS 2011 Asia/Australia Regional Meeting.
30. The importance of disposable bioreactors in cells proliferation. 2nd International Student Conference of Biotechnology, University of Tehran (2008).
31. A review on the role of engineered parameters in bioreactors used for 3d tissue constructions. 2nd International Student Conference of Biotechnology, University of Tehran (2008).

And 5 other papers in Persian.

Patents

- 15 Iranian Patents.

Book

- The Role of Biodegradable Engineered Scaffold in Tissue Engineering. In: Biomaterials science and engineering. In Tech, 2012.
And 3 other books in Persian.

Current Research

- Investigating the technical parameters for gas transfer in an oxygenator (artificial lung).
- Technical knowledge of design an external intelligent artificial lung
- Design and construction of biohybrid lung based on membrane and stem cell technology
- Design and construction of mammalian cell culture bioreactor for producing recombinant drugs
- Design a Bioreactor for Schwann cell culturing on nanofibers
- Design a Bioreactor for vascular tissue engineering
- Investigation of cartilage tissue generation in a bioreactor
- Design of microbioreactors and investigation of engineering parameters
- Design of nanosystems for drug delivery to cancer cells
- Technical knowledge and production of nano-medicine to repair damaged cell membranes
- Engineered screening of oil-eating micro-organisms for bioremediation of PAH by small scale biotechnology technique (SSB)
- Biofunctional magnetic nano-particles for protein separation and pathogen detection
- Nanobiosensor fabrication Using of Gas Phase Enzyme Reaction in food industry, drug industry and petrochemical
- Design and construction of enzyme nanobioreactor
- Design and construction of biosensor based on enzymes or microorganisms used in gas detecting

Thesis Guidance:

- Development of novel method for bio-product or pathogenic microorganisms separation using biofunctional magnetic nanoparticles
- Removal of Nickel Ions from industrial wastewaters in anaerobic condition using Ion oxide nanoparticles

- Optimization of bioremoval process of Aromatic hydrocarbons by microorganisms
- Optimization of production condition of Biosurfactant from *bacillus subtilis* used in increasing oil recovery
- Modeling and optimization of production condition of biosurfactants by magnetic nanoparticles in a lab stirred tank bioreactor
- Processing of synthesis nanodrug based on Iron oxide nanoparticles
- Rapid purification of silver nanoparticles via difiltration
- Bioleaching process for removal of environmental contaminant from spent catalyst of oil industries in milli bioreactor and separation of extractive Ions with magnetic nanoparticles
- Structural analysis of *Bacillus subtilis* on shake milli fermentator
- Optimization of production condition of emulsion using milli bioreactor
- Synthesis of coated magnetite nanoparticles
- Removal of Pb metal from industrial wastewaters using magnetite Iron nanoparticles
- Access to technical knowledge of small scale bioreactor with online monitoring for promoting of production in fermentation processes
- Study on the engineering parameters of controlled size nanoliposomes production
- Modeling and manufacturing of pilot scale shaken disposable bioreactor
- Optimization of operational conditions for biosurfactant production by *Pseudomonas aeruginosa* MM1011 in shaken bioreactor and purification of product by nanoparticles
- Optimization and statistical investigation of microorganism immobilization methods for hydrogen sulfide biosensor
- Model predictive of milibioreactor based on sensor data fusion
- Mathematical modeling of microbial enhanced oil recovery
- Investigation the differentiation of endometrial stem cells to osteoblast and their seeding on gelatin scaffold

- Determination of mass transfer parameters in a hollow fiber oxygenator and validation with experimental model
- Fabrication and design of polymeric 3D new scaffold for using in life science engineering
- Fabrication and design of biodegradable polymeric nano scaffolds by electrospinning using in tissue engineering
- Optimization and investigation hydrodynamics of mammalian cell culture in the bioreactor
- Modeling of energy distribution rate on mammalian cells in a bioreactor and validation with experimental method

Special Honors

- First rank in bachelor studies, University of Tehran, Iran (1993)
- Chosen as one of 10 superior PhD Thesis at ESBES conference in Austria (2006)
- The best Technology and business plan for Milibioreactor (2008)
- Dominant Researcher at University of Tehran (2008)
- Superior in innovation section of Chamran festival for Artificial Lung (2009) and for microbioreactor (2010)
- Chosen in Honoring the Scholars for Targeting drug delivery to cancer cells (2010)
- Chosen in Avicenna festival for external artificial lung (2011)