ABDOLLAH ALLAHVERDI

Faculty member

Tarbiat Modares University, Faculty of Biological Sciences, Department of Biophysics

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EDUCATION

PhD Nanyang Technological University, Singapore July 2011

Thesis: Investigation Effect on Histone Tail Modification on Chromatin Condensation in Nuclesosome Array

Supervisor: Prof. Lars Nordenskiold

MS University of Tehran, Tehran-Iran May 2001

Thesis: Kinetics of L-sorbose production by *A.suboxydans* T.U 301 in Fed-Batch culture

Supervisor: Prof. Nasser Ghaemi

HONORS AND AWARDS

Iran National Science Foundation INSF grant for project entitled: 2018

"Early lung cancer diagnostic using microfluidic platform"

Iran's National Elites Foundation Award for Faculty employment in

Tarbiat Modares University 2016

Singapore International Graduate Student Award for PhD study

, Singapore 2006-2010

DAAD scholarship for master student exchange 2000-2001

RESEARCH EXPERIENCE

National University of Singapore, Singapore 2012 to 2015

Research Fellow

- Epigenetic Profiling using micro – nanofluidic
- Nano- Micro integrated channel fabrication
- Nano-Micro cross channel fabrication

Nanyang Technological University, Singapore 2011 to 2012

Research Fellow

- Site-direct histone protein modification

Pasteur Institute of Iran, Tehran- Iran 2002 to 2006

Biotechnology Researcher

- Bacterial culture optimization,
- Recombinant Protein Purification

TEACHING EXPERIENCE

Trabiat Modares, Tehran - Iran May 2016 to Present

Assistant Professor, Department of Biophysics

- Membrane Biophysics
- Drug Biophysics
- Current topic in Biophysics
- Biophysical Approaches

Nanyang Technological University, Singapore May 2011 to Aug 2015

Teaching Assistant, Structural and computational Biology

- Electron microscopy for BSc student (Both theory and practical)
- Analytical Ultra Centrifugation AUC (Principle, application in both theory and practical)

THESIS ADVISORY COMMITTEE

Doctoral Students Advisor

Mr. Hossein Solymani, "*Study on the Viability, phenotypic expression and differentiation of Micro encapsulated mesenchymal Stem Cell Using Microfluidic Approaches*",

Mrs. Rashin Mohammadi, "*Separation and diagnosis of HEPG2 Circulating Tumor Cells (CTC) using microfluidic platform*",

Mr. Jalil Parchegani, "*Design and fabrication of electrochemical biosensor for early detection of miRNAs involved in breast cancer in the microfluidic platform*.",

Masters Students Supervisor

Mr. Koosha Irani, "*Optimization of early lung cancer diagnosis by microfluidic approaches*",

Ms. Zahra Sahafnejad, "*Electrochemistry based lung cancer important microRNAs detection in microfluidic platform*",

Ms. Morvarid Tajik, "*Design and fabrication of a platform for miR-9 involved in lung cancer detection using microfluidic approach*",

Mr. Mohsen Roostaie, "*Synthesis and characterization of hydroxyapatite nanoparticles and use it in drug delivery*",

Mr. Mohammad Hossein Afsharian, "*Investigation of synergic effects of nanogroove topography and polyaniline-chitosan nanocomposites on PC12 cell differentiation and axonogenesis*",

Ms. Sima Lajevardi, "*Diagnosis of breast cancer from histopathological images using deep learning models*",

PUBLICATIONS

Journal Publications

- M. Darvazi, …**A. Allahverdi**, …P. Abdolmaleki. *A computational study of the R120G mutation in human αB-crystallin: implications for structural stability and functionality*. Journal of Biomolecular Structure and Dynamics 2023; 1-11

- S Ramazi, M Salimian, **A Allahverdi**, S Kianamiri, P Abdolmaleki. *Synergistic cytotoxic effects of an extremely low-frequency electromagnetic field with doxorubicin on MCF-7 cell line.* Scientific Reports **2023**; 13 (1), 8844
- H Hashemzadeh, Z Khadivi-Khanghah, **A Allahverdi**, H. Naderi-Manesh. *A novel label-free graphene oxide nano-wall surface decorated with gold nano-flower biosensor for electrochemical detection of brucellosis antibodies in human serum*. Talanta Open **2023**; 7, 100215
- Z Sahafnejad, S Ramazi, **A Allahverdi**. *An update of epigenetic drugs for the treatment of cancers and brain diseases: A comprehensive review*. Genes **2023**; 14 (4), 873
- Z Ziaei-Rad, M Pazouki, , **A Allahverdi**. *Investigation of a robust pretreatment technique based on ultrasound-assisted, cost-effective ionic liquid for enhancing saccharification and bioethanol production from wheat straw*. Scientific Reports **2023** 13 (1), 446
- H Hashemzadeh, AHA Kelkawi, **A Allahverdi**, M Rothbauer, P Ertl. *Fingerprinting metabolic activity and tissue integrity of 3D lung cancer spheroids under gold nanowire treatment*. Cells **2022**;11 (3), 478
- J Parchekani, **A Allahverdi**, M Taghdir, H Naderi-Manesh. *Design and simulation of the liposomal model by using a coarse-grained molecular dynamics approach towards drug delivery goals*. Scientific Reports **2022**; 12 (1), 2371
- S Ramazi, N Mohammadi, **A Allahverdi**, E Khalili, P Abdolmaleki. *A review on antimicrobial peptides databases and the computational tools*. Database **2022**; baac011-022
- H Hashemzadeh, S Shojaeilangari, **A Allahverdi**, M Rothbauer, P Ertl. *A combined microfluidic deep learning approach for lung cancer cell high throughput screening toward automatic cancer screening applications*. Scientific reports **2021**; 11 (1), 9804
- M Ghorbani, …**A. Allahverdi**, H. Naderi-Manesh. *Microfluidic investigation of the effect of graphene oxide on mechanical properties of cell and actin cytoskeleton networks: Experimental and theoretical approaches*. Scientific Reports **2021**; 11 (1), 16216
- J Parchekani, H Hashemzadeh, **A Allahverdi**, H Siampour, S Abbasian. *Zepto molar miRNA-21 detection in gold Nano-islands platform toward early cancer screening*. Sensing and Bio-Sensing Research **2021**; 34, 100449
- S Ramazi, **A Allahverdi**, J Zahiri. *Evaluation of post-translational modifications in histone proteins: A review on histone modification defects in developmental and neurological disorders*. Journal of biosciences **2020** 45, 1-29
- Z Vaezi, M Sedghi, M Ghorbani, S Shojaeilangari, **A Allahverdi**. *Investigation of the programmed cell death by encapsulated cytoskeleton drug liposomes using a microfluidic platform*. Microfluidics and Nanofluidics **2020** 24, 1-15
- H. Hashemzadeh, **A. Allahverdi**, …..., H. Naderi-Manesh. *PDMS nano-modified scaffolds for improvement of stem cells proliferation and differentiation in microfluidic platform.* Nanomaterials **2020**; 10 (4), 668
- H. Hashemzadeh, **A. Allahverdi**, …., H. Naderi-Manesh. *Gold Nanowires/Fibrin Nanostructure as Microfluidics Platforms for Enhancing Stem Cell Differentiation: Bio-AFM Study.* Micromachines **2019**; 11 (1), 50
- RA Taheri, V Goodarzi, **A Allahverdi**. *Mixing Performance of a Cost-effective Split-and-Recombine 3D Micromixer Fabricated by Xurographic* Method. Micromachines **2019**; 10 (11), 786
- M. Ghorbani, H. Soleymani, **A. Allahverdi**, ….., H. Naderi-Manesh. *Effects of natural compounds on conformational properties and hairpin formation of amyloid-β42 monomer: docking and molecular dynamics simulation study*. Journal of Biomolecular Structure and Dynamics, **2020**; 1-13

- H. Soleymani, M. Ghorbani, **A. Allahverdi**, …, H. Naderi-manesh. *Activation of human insulin by vitamin E: A molecular dynamics simulation study.* Journal of Molecular Graphics and Modelling **2019**; 91, 194-203
- N Venkatesan, JF Wong, KP Tan, HH Chung, YH Yau, E Cukuroglu**, A Allahverdi**, L Nordenskiöld, , *EZH2 promotes neoplastic transformation through VAV interaction-dependent extranuclear mechanisms.* Oncogene. **2018; 37** (4), 461-477
- Kaczmarczyk, **A. Allahverdi**, T.B. Brouwer , L. Nordenskiöld , N. H. Dekker , J. van Noort. *Single-molecule force spectroscopy on histone H4 tail cross-linked chromatin reveals fiber folding*. Journal of biological chemistry. **2017**; 292 issue 42; 17506-17513
- N. Bereznhoy, Y. Liu, **A. Allahverdi**, Chun-jen Su, N. Korolev, L. Nordenskiold *Influence of Ionic Environment and Histone tails on Columnar order of nucleosome core particle.* Biophysical Journal. **2016**; (110) (8) 1720-1731
- A. Kaczmarczyk, K. Vendel, **A. Allahverdi**, L. Nordenskiöld, N. H Dekker, J. van Noort. *Unravelling the Role of Liker Histone H1 and the H4 tail in Chromatin (un)-folding*. Biophysical Journal. **2016**; (110) (3) 68
- **A. Allahverdi**, Qinming Chen, Nikolay Korolev, Lars Nordenskiold. *Chromatin Compaction under mixed Salt condition: Opposite effects of Sodium and Potassium ions on Nucleosome Array Folding.* Scientific Reports **2015;** 5 (1), 8512
- L. Nordenskiold, N. Korolev, A. Lyubartsev, **A. Allahverdi**, Y. Liu, R. Yang, C.F.chuan, M. He, J. Van Noort. *Interactions and Stacking in ordered mononucleosomes and folded chromatin: Effects of Histone tail modifications.* Biophysical Journal. 2014 106 (2) 74a
- Y. Kim, B. Kundukad, **A. Allahverdi**, L. Nordenskiold, P. S. Doyle, J. van der Maarel. *Gelation of the genome by topoisomerase II targeting anticancer agents.* Soft Matter 2013) 9 (5): 1656-1663
- S.Ahmadi, R. Tabaraki, N.Jafari, **A. Allahverdi**, A. Azhdehakoshpour. *Study of nickel and copper biosorption on brown algae Sargassum angustiflium: application of response surface methodology (RSM).* Environmental Technology. 2012 (34)(16) 2423-2431
- N. Korolev, **A. Allahverdi**, Y. Liu, R. Yang, A.P. Lyubartsev, Y. Fan, C-F Liu, L. Nordenskiold. *Nucleosome-Nucleosome stacking: A major element of chromatin Structure.* Biophysical Journal. 2012 Vol 102 issue 2 P 580a
- N. Korolev, **A. Allahverdi**, A. P. Lyubartsev, L. Nordenskiold. *The polyelectrolyte properties of chromatin*. Soft Matter (2012) 8; 9322-9333.
- L. Nordenskiold, N. Korolev, **A. Allahverdi**, Y. Liu, R. Yang, Y. Fan, C-F. Liu. *The effect of Histone H4 acetylation in nucleosome- nucleosome interaction and on chromatin folding and fiber-fiber association*. Biophysical Journal. 2012. 102 (3) 481a
- N. Korolev, Y. Zhao, A. **Allahverdi**, K. D. Eom, J. P Tam, L. Nordenskiold. *The effect of salt on oligocation-induced chromatin condensation*. Biochemical and Biophysical Research Communication 418 (2012) 205-210
- N. Korolev, N. Berezhnoy, **A. Allahverdi**, R. Yang, C-F Liu, J-P Tam, L. Nordenskiold. *Chromatin condensation: general polyelectrolyte association and histone-tail specific folding*. European Biophysics journal with biophysics letters. (2011) vol 40 p 98
- F. Li, A. **Allahverdi**, Y. Renliang, G. Bing Jia Lua, X. Zhang, Y. Cao, N. Korolev, L. Nordenskiold, L. Chuan-Fa. *Direct Method for Site-specific Protein Acetylation*. Angewandte Chemie International Edition. 2011 Vol 50, issue 41 9611-9614
- **A. Allahverdi**,.; Yang, R.; Korolev, N.; Fan, Y.; Davey, C.; Liu, C. F.; Nordenskiöld, L. *The Effects of Histone H4 Tail Acetylations on Cation-Induced Chromatin Folding and Self-Association*. Nucleic Acid Research. 2011 39(5): 1680-1691
- N. Korolev, **A. Allahverdi**, Y. Yang, Y. Fan, A. Lyubartsev, L. Nordenskiold. *Electrostatic Origin of Salt-Induced Nucleosome Array Compaction.* Biophysical Journal. 2010 Vol 99 1896-1905.

- L. Nordenskiöld, **A. Allahverdi**, N. Berezhnoy, N. Korolev, Y. Liu, C. Lu, A. P. Lyubartsev and Ye Yang. *Counterion induced electrostatic condensation of nucleosomes and chromatin arrays*. Biophysical Journal.2009 Vol 96 issue 3 P54a
- A. Akbarzadeh, D. Noruzian, Sh. Jamshidi, A. Farhangi, M.R. Mehrabi, B. Lame Rad, M. Mofidian, and **A. Allahverdi**. *Treatment of Streptozotocine Induced Diabetes Mellitus in Male Rats by Immunoisolated Transplantation of Purified Langerhans Islet Cells*. Asian Journal of Biochemistry. 2007 Vol 2 (1): 31-41
- A. Akbarzadeh, D. Noruzian, A. Farhangi, M.R. Mehrabi, M. Bakhtiari, P. Afshar, **A. Allahverdi** M. Mofidian. *Study of Human Therapeutic Morphine Vaccine: Safety and Immunogenicity*. Asian Journal of Biochemistry. 2007 Vol 2 (1): 58-65
- A. Akbarzadeh, D. Noruzian,Sh. Jamshidi,A. Farhangi, M.R. Mehrabi, B. Lame Rad, M. Mofidian, **A. Allahverdi**. *Treatment of streptozotocin induced diabetes in male rate by immunoisolated transplantation of islet cells*. Indian Journal of Clinical Biochemistry. 2007 / Vol 22 (1) 71-76
- A. Akbarzadeh, D. Norouzian, M.R. Mehrabi, Sh. Jamshidi , A. Farhangi , **A. Allahverdi**, S.M.A. Mofidian and B. Lame Rad. *Induction of diabetes by streptozotocin in rats*. Indian Journal of Clinical Biochemistry. 2007 / Vol 22 (2) 60-64

Conference Papers (Peer-Reviewed)

- Yun Soo Kim, B. Kundukad, Abdollah Allahverdi, Lars Nordenskold Patrick S. Doyle and Johan R. C. van derMaarel. Gelation of DNA by topoisomerase II and its targeting anticancer drugs. IUPAC, World Polymer Congress. Blacksburg, USA 2012 June 2-5th
- Y. S. Kim, B. Kundukad, A. Allahverdi, L. Nordenskold, P. S. Doyle and J. R. C. van der Maarel. *Flow and gelation of DNA by topoisomerase II and some of their targeting cancer therapeutics*. Institute Curie congress. Paris- France 2012 July 12
- Y. S. Kim, B. Kundukad, A. Allahverdi, L. Nordenskold, P. S. Doyle and J. R. C. van der Maarel. *Using Microrheology to Probe the Gelation of Circular DNA Via Topoisomerase II Clamp Formation and Relation to Anticancer Drugs*. The XVIth International Congress on Rheology. Portugal 2012 August 3-6th
- C. Qinming, A. Allahverdi, N. Korolev and L. Nordenskiöld. *Na^+ and K^+ affect the Mg2+ induced chromatin self-association*. 6th Mechanobiology Conference. Singapore. 2012 November 12-14
- A. Allahverdi, N. Korolev and L. Nordenskiöld. *Investigating effects of histone tail modification on chromatin condensation in nucleosome array*. 6th Mechanobiology Conference. Singapore. 2012 November 12-14
- N. Korolev, A. Allahverdi, A. P. Lyubartsev, C.-Fa Liu and L. Nordenskiöld. *Nucleosome-nucleosome stacking: a major element of chromatin structure.* 6th Mechanobiology Conference. Singapore. 2012 November 12-14
- N. Korolev, N. Berezhnoy, A. Allahverdi, R. Yang, C.-Fa Liu, J. P. Tam, L. Nordenskiold. *Chromatin condensation: general polyelectrolyte association and histone-tail specific folding*. 8th EBSA European Biophysics Congress. Budapest 2011 August 23-27
- A. Allahverdi, N. Korolev, L. Nordenskiold. *Investigating effects of histone tail modification on chromatin condensation in nucleosome array*. 6th International Conference on Structural Biology & Functional Genomics. Singapore. 2010 Dec 6-8

- A. Allahverdi, A. P. Lyubartsev, C.-Fa Liu, N. Korolev and L. Nordenskiöld. *Compaction and aggregation of model chromatin arrays utilizing nucleosome-positioning DNA sequence.* Histones, Nucleosomes, Chromosomes, Genomes. Singapore 2009 Feb 9-11 Chromatin
- L. NORDENSKIÖLD; N. KOROLEV; A. ALLAHVERDI; N. BEREZHNOY; Y. LIU; C. LU; A. LYUBARTSEV; Y. YANG. *Counterion Induced Electrostatic Condensation of Nucleosomes and Chromatin Arrays*. ***Symposium M*** *- DNA Nanoscience and Physics*
- A. ALLAHVERDI; N. KOROLEV; L. NORDENSKIÖLD. *Compaction and aggregation of model chromatin arrays utilizing nucleosome-positioning DNA sequence.* ***Symposium M*** *- DNA Nanoscience and Physic.* Singapore 2009 Jun 28-July 03
- M. PAZOUKI, A. ALLAHVERDI AND M. BANIFATEMI. *Microbial decolonization of molasses spent wash: Combined defect of Aspergillus fumigatus and activated carbon.* International Conference on Environment. Penang, Malaysia 2006 Nov. 13-15

LANGUAGES

Persian: Native Language

English: Intermediate Listener and Speaker, Advanced Reading and Writing. TOEFL 595 (2006 paper based TOEFL)

SKILLS

Biochemistry lab skills: cloning, expression, purification, PCR,

Microfluidics skills: Design, fabrication, manipulation fluids in micro-channels

Computer skills: Adobe illustrator, Top Spin NMR data assignment, Ultra Scan, Sedfit,

REFERENCES

- Prof. Lars Nordenskiold,

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- Prof. Hossein Naderimanesh

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Tehran e-mail naderman@modares.ac.ir

- Prof. Jalal Shayegan

Sharif University of Technology, Department of Chemical and Petroleum Engineering, Iran Telephone +98 21 66165420 e-mail shayegan@sharif.edu

- Prof. Mohammad Pazouki

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