Curriculum Vitae

Alireza Sanati

Assistant Professor, Biosensor Research Center, Isfahan University of Medical Sciences

Sex: Male | Date of birth: 08/08/1990 | Nationality: Iranian

Place of Birth: Isfahan
Marital Status: Married

Falatoori street, Isfahan, Iran. 8193763767.

(+98)9103140827

alireza.sanati@med.mui.ac.ir, alireza.sanatisichani@gmail.com

https://www.linkedin.com/in/alireza-sanati-45729578

Education and Research Activities:

- ***Yazd University* (Sep 2008- Sep 2012)**
  Bachelor of Science, Materials Engineering.
- ***Isfahan University of Technology* (Sep 2012- Jan 2015)**
  Master of Science, Corrosion and Electrochemistry of Materials.
- ***Isfahan University of Technology* (Sep 2015- Mar 2020)**
  Doctor of Philosophy, Materials Engineering/ Nano-biomaterials.
- ***McGill University***
  Visiting Scholar, Bioengineering Department and Anatomy and Cell Biology Department, Montreal, Canada (Sep 2018-Jun 2019)
- ***Isfahan University of Medical Sciences* (Jan 2020- Sep 2021)**
  Research Associate, Biosensor Research Center, School of Advanced Technologies in Medicine
- ***Isfahan University of Medical Sciences* (Since Oct 2021)**
- Assistant Professor, Biosensor Research Center, School of Advanced Technologies in Medicine

Theses:

- **Ph.D. Thesis:**
  Fabrication and design of three-dimensional nanostructures of graphene/ gold for electrochemical detection of myocardial infarction and bacteria
  Supervisors: Prof. Keyvan Raeissi, Prof. Fathallah Karimzadeh
  Advisors: Prof. Hojatollah Vali, Dr. Sara Mahshid, Dr. Mahshid Kharaziha

- **M.Sc. Thesis:**
  Characterization and investigation of electrochemical performance of stainless steel thin films produced by cathodic arc evaporation and magnetron sputtering
  Supervisors: Prof. Hossein Edris, Prof. Keyvan Raeissi

- **B.Sc. Thesis:**
  Electroless coloring process for anodized aluminium nanotubes and the effects of anodizing parameters on its corrosion behavior
  Supervisor: Dr. Masoud Moshrefifar

Teaching Experience:

- ***Graduate Teaching Assistant***
  Isfahan University of Technology
  Jan 2018- Sep 2018
  Advanced corrosion and electrochemistry

- ***Graduate Teaching Assistant***
  Isfahan University of Technology
  Feb 2017- Jun 2017
  Advanced corrosion and electrochemistry

- ***Graduate Teaching Assistant***
  Isfahan University of Technology
  Feb 2017- Jun 2017
  Corrosion in welded sections

- ***Teaching Assistant***
  Isfahan University of Technology
  Sep 2017- May 2018
  Corrosion and electrochemistry

- ***Teaching Assistant***
  Isfahan University of Technology
  Oct 2016- Jan 2017,
  Corrosion and electrochemistry

- ***Teaching Assistant***
  Isfahan University of Technology
  Oct 2015- Jan 2016,
  Corrosion and electrochemistry

Publications:

- ***Journal Papers:***

- [1] Alireza Sanati, Yasaman Esmaeili, Elham Bidram, Laleh Shariati, Mohammad Rafieinia*, Sara Mahshid, Onur Parlak*, "Wearable non-invasive electrochemical glucose monitoring: Recent advancement in device design and materials", *Applied Materials Today*, 26, **2022**, 101350, **IF=10.041**

  [2] Alireza Sanati, Roozbeh Siavash Moakhar, Imman Issac Hoseini, Keyvan Raeissi, Fathallah Karimzadeh, Mahsa Jalali, Mahshid Kharaziha, Sara Mahshid, Sara Sheibani, Laleh Shariati, John F. Presley, Hojatollah Vali, Sara Mahshid* "Gold Nano/Micro-Islands Overcome the Molecularly Imprinted Polymer limitations to Achieve Ultrasensitive Protein Detection", *ACS Sensors*, 6, **2021**, 797–807, **IF=7.711**.

  [3] Alireza Sanati, Mahsa Jalali, Keyvan Raeissi, Fathallah Karimzadeh, Mahshid Kharaziha, Sahar Sadat Mahshid*, and Sara Mahshid* "A review on recent advancements in electrochemical biosensing using carbonaceous nanomaterials" *Microchimica Acta*, 186, **2019**, 773, **IF=6.232.**

  [4] Alireza Sanati*, Keyvan Raeissi, Fathallah Karimzadeh, "A cost-effective and green-reduced graphene oxide/polyurethane foam electrode for electrochemical applications" *FlatChem*, 20, **2020**, 100162, **IF=5.227.**

[5] Roozbeh Siavash Moakhar, Tamer Abdelfattah, Alireza Sanati, Mahsa Jalali, Sarah Elizabeth Flynn, Sahar Sadat Mahshid, Sara Mahshid*, "Direct and Plasmonic Assisted Impedimetric Detection of Bacteria Using Hierarchical 3D Nanostructured Gold/Graphene Microfluidic Device" *ACS Applied Materials and Interfaces*, 12, **2020,** 23298–23310, **IF=9.229**.

[6] Fereshteh Vajhadin, Mohammad Mazloum-Ardakania*, Alireza Sanati, Jadranka Travas-Sejdic*, Reihaneh Haghniaz "Latest advances in optical cytosensors for detection of breast cancer cells, *Journal of Materials Chemistry B*, **2022, IF=6.331**.

[7] Yasaman Esmaeili; Mohammad Khavani, Ashkan Bigham, Alireza Sanati, Elham Bidram, Laleh Shariati, Mohammad Rafienia*Ali Zarrabi, *International Journal of Biological Macromolecules*, **2022, IF=6.953**

[8] Alireza Sanati*, Keyvan Raeissi, Hossein Edris, "Investigation of the corrosion behavior of cathodic arc evaporated stainless steel coating in 3.5 % NaCl", *Protection of Metals and Physical Chemistry of Surfaces*, Vol. 53, No. 5, **2017**, pp. 902-909, **IF=1.194**.

[9] Salar Fatoureh Bonabi, Fakhreddin Ashrafizadeh, Alireza Sanati*, Saeid Mehran Nahvi," Structure and corrosion behavior of arc sprayed Zn-Al coatings on ductile iron substrate", *Journal of Thermal Spray Technology*, Vol. 27, **2018**, pp 524-537, **IF=2.757.**

[10] Masoud Hosseini Ballam, Fathallah Karimzadeh*, Mohammad Hossein Enayati, Alireza Sanati*, Developing a nanostructured surface layer on AISI 316 stainless steel by ultrasonic surface nanocrystallization and evaluating its tribological properties, *Surface Topography: Metrology and Properties*, Vol. 9, **2021**, 025010, **IF=2.038**.

[11] Alireza Sanati, Roozbeh Siavash Moakhar, Keyvan Raeissi, Fathallah Karimzadeh, Hojatollah Vali, Sara Mahshid*, Detection of heart-fatty acid binding protein in human serum using gold nano/micro-islands and molecularly imprinted polymers, *Proceedings of the IEEE Conference on Nanotechnology*, **2021**, pp. 397–399.

[12] Alireza Sanati, Roozbeh Siavash Moakhar, Tamer Abdelfatah, Mahsa Jalali, Elizabeth Flynn, Sahar Sadat Mahshid, Sara Mahshid*, "Impedimetric Detection of Bacteria Using Hierarchical 3D Nanostructured Gold Contribution", *Proceedings of the IEEE Conference on Nanotechnology*, **2020**, pp. 250–252, 9183444

[13] Alireza Sanati*, Hossein Edris, Keyvan Raeissi, "Structural characterization and investigation of hardness and adhesion of fine-grained stainless-steel coatings produced by physical vapor deposition methods on carbon steel substrate" *Iranian Journal of Surface Science and Engineering*, Vol. 12, No. 29, **2016**, pp. 33-44.

[14] Alireza Sanati*, Keyvan Raeissi, Hossein Edris, "Growth defects and chromium content loss during the deposition of stainless steel by CAE-PVD and its effect on the corrosion and passivation behavior of the coating", *International Journal of ISSI*, Vol. 12, No. 2, **2015**, pp. 7-16.

- ***Under evaluation/ submission papers***

[1] Alireza Sanati, Amir hossein Kefayat, Mohammad Rafienia*, Keyvan Raeissi,

Fathallah Karimzadeh, Mohammad Reza Salamat, Sara Sheibani, John F. Presley*, Hojatollah Vali, "A novel reduced graphene oxide/polyurethane scaffold with shape-recovery capability for bone regeneration", **2022**

[2] Amir Hamed Aghajanian, Ashkan Bigham, Alireza Sanati, Amir hossein Kefayat, Mohammad Rafienia*, Mohammad Reza Salamat, Magnetic and macro-porous poly-3-hydroxybutirate modified Mg_2SiO_4-$CuFe_2O_4$ scaffold for hyperthermia and bone regeneration, **Under review, Materials Science and Engineering C, 2022**.

[3] Roozbeh Siavash Moakhar, Carolina del Real Mata, Alireza Sanati, Imman I. Hosseini, Fahimeh Ghasemi, Sahar Sadat Mahshid, Mohammad Amin Tabatabaeifar, Sara Mahshid*, An Automated Fluidic Assay based on Molecularly Imprinted Polymer for COVID 19 Diagnostics and Serosurveillance, **Under Submission**, **2022**.

[4] Yasaman Esmaeili, Zahra Mohammadi; Mohammad khavani, Alireza Sanati, Laleh Shariati, Hooria Seyedhosseini Ghaheh, Elham Bidram, Ali Zarrabi, submitted to **Applied Materials Today**, 2022.

Conference papers

[1] Alireza Sanati, Roozbeh Siavash Moakhar, Tamer Abdelfatah, Mahsa Jalali, Elizabeth Flynn, Sahar Sadat Mahshid, Sara Mahshid*, "Impedimetric Detection of Bacteria Using Hierarchical 3D Nanostructured Gold Contribution", **Oral Presentation**, 2020 IEEE 20th International Conference on Nanotechnology (IEEE-NANO), July 29-31, **2020**, Virtual Conference.

[2] Alireza Sanati, Keyvan Raeissi, Fathallah Karimzadeh, Mahsa Jalali, Sara Sheibani, Hojatollah Vali, Sara Mahshid*," Deposition of Gold Nano-Micro Islands on Electrochemically Reduced Graphene Oxide to Use in Combination with Molecularly Imprinted Polymers", **Oral Presentation**, ECS Meeting Abstracts, Volume MA2020-01, IMCS 11: Chemical and Biosensing Materials and Sensing Interface Design, **2020**, Montreal, Canada.

[3] Alireza Sanati*, Keyvan Raeissi, Fathallah Karimzadeh, Mahsa Jalali, Sara Sheibani, Hojatollah Vali, Sara Mahshid*,"Introducing a three-dimensional electrode based on electrochemically reduced graphene oxide/gold nano-micro islands", **Poster presentation**, 8th International Conference on Nanostructures (ICNS8), Nov 28-30, **2020**, Tehran, Iran.

[4] Roozbeh Siavash Moakhar, Tamer Abdelfatah, Alireza Sanati, Mahsa Jalali, Elizabeth Flynn, Sahar Sadat Mahshid, Sara Mahshid*, "Direct Impedimetric Detection of Bacteria Using Nanostructured Based Microfluidic Device", **Oral presentation**, 103rd Canadian Chemistry Conference and Exhibition (CCCE 2020), **2020**, Winnipeg, Canada.

[5] Alireza Sanati, Roozbeh Siavash Moakhar, Keyvan Raeissi, Fathallah Karimzadeh, Hojatollah Vali, Sara Mahshid*, Detection of heart-fatty acid binding protein in human serum using gold nano/micro-islands and molecularly imprinted polymers, 21st IEEE International Conference on Nanotechnology, **Oral Presentation**, **2021**, Montreal, Canada.

[6] Alireza Sanati, Roozbeh Siavash Moakhar, Keyvan Raeissi, Fathallah Karimzadeh, Hojatollah Vali,

Sara Mahshid*, Molecularly imprinted o-phenylenediamine and gold nano-micro/islands for early detection of myocardial infarction, IUPAC CCCE 2021-48th World Chemistry Congress & 104th Canadian Chemistry Conference, **Poster presentation**, **2021**, Virtual conference.

- ***Book:***

[1] Introduction to corrosion science, by E. McCafferty, Translated to Persian by: Masoud Atapour, Alireza Sanati, Davood Parvareshfar, *Isfahan University of Technology Publication Center,* **2017.**

Patent

[1] Alireza Sanati, "Design and fabrication of three-dimensional electrode based on gold nano-micro electrodes/reduced graphene oxide for electrochemical sensors", Patent number 102848, Iran, **2020**.

Current research plans:

[1] Non-invasive detection of uric acid in saliva using graphene and cobalt oxide nanozymes (plan No, 56830, collaborative project between biosensor research center and IUT), **2022**.

[2] Fabrication of a disposable Impedimetric biosensor to assess carcinoembryonic antigen level for colorectal cancer monitoring (plan No, 56826, collaborative project between biosensor research center and Isfahan University), **2022**.

[3] Developing a disposable graphene/molecularly imprinted polymer biosensor for rapid and point of care detection of D-dimer protein (plan No, 56798, collaborative project between biosensor research center and IUT), **2022**.

[4] An Automated Fluidic Assay based on Molecularly Imprinted Polymer for COVID-19 Diagnostics (plan No, 54610, collaborative project between biosensor research center, McGill University (Canada) and Genetic and Molecular Department of Isfahan University of Medical Sciences), **2021**.

[5] Fabrication of a flexible biosensor via extrusion printing of reduced graphene oxide/chitosan ink on bacteria-nano cellulose paper for detection of glucose in sweat (plan No. 53782, collaborative project between Biosensor Research Center and Isfahan University), **2021**.

[6] Point of care detection of cancer cells using three dimensional graphene/gold nanostructures/ aptamer based cytosensor (plan No. 53679, collaborative project between Biosensor Research Center and Applied Physiology Research Center of Isfahan University of Medical Sciences), **2021**.

[7] Characterization of magnetic and porous poly-3-hydroxybutirate modified Mg_2SiO_4-$CuFe_2O_4$ scaffold for hyperthermia and bone regeneration (plan No. 55582, Isfahan University of Medical Sciences), **2021**.

[8] Fabrication and evaluation of properties of magnetic and porous Mg_2SiO_4-$CuFe_2O_4$ scaffold for hyperthermia and bone regeneration (plan No. 55581, Isfahan University of Medical Sciences), **2021**.

[9] Wearable Non-Invasive Electrochemical Glucose Monitoring: Recent Advancement in Materials and Device Design (plan No. 52631, collaborative project between Biosensor Research Center and Karolinska Institutet, Sweden), **2020**.

[10] Introducing flexible and cost-effective polyurethane/reduced graphene oxide scaffold: quantification of geometrical changes during cyclic mechanical tests and evaluation of ability in bone regeneration (plan No. 299096, collaborative project between Biosensor Research Center, McGill University (Canada), and Isfahan University of Technology), **2020.**

[11] Latest advances in optical cytosensors for detection of breast cancer cells (collaborative project between biosensor research center and Yazd University), **2020.**

Honours and Awards:

- Best materials engineering student in the second student festival of Issar (Iran), Distinguished by Prof. Mojtaba Sadighi, Deputy Minister, President of the Students Affairs Organization, Jul 2018.
- Distinguished student in the eighth scientific-student festival at Isfahan University of Technology, May 2019.
- Distinguished student in the seventh scientific-student festival at Isfahan University of Technology, Mar 2018.
- Distinguished student in the sixth scientific-student festival at Isfahan University of Technology, Mar 2017.
- Distinguished student in the third scientific-student festival at Isfahan University of Technology, Mar 2014.
- Appreciated Student by Prof. Mohammad Reza Toroghinejad, the head of Department of Materials Engineering at Isfahan University of Technology for sport activities and honors, 2015.
- Member of Isfahan University of Technology badminton doubles team that ranked three in student Olympiad competitions between Iranian Universities, 2018.
- Member of Isfahan University of Technology badminton doubles team that ranked first in student competitions between Iranian Universities, 2018.
- Member of Isfahan University of Technology badminton doubles team that ranked first in student competitions between Iranian Universities, 2014.
- Member of Isfahan University of Technology badminton team that ranked second in student competitions between Iranian Universities, 2014.

Other activities:

- Laboratory teaching assistant, Electrochemistry Lab, Isfahan University of Technology, Materials Engineering Department, Sep 2017- Sep 2018.
- Scientific consultant and founder of Mobtakeran Sathe Pasargad Company at Isfahan Science and Technology Town/ 2015- Sep 2018.

Skills:

- *Computer:*
  - Phase and Microstructural analysis technique such as Image J, X'pert Highscore
  - Electrochemical methods software, Nova, Zview, Power Suite and Ivium …
  - Microsoft Office (Word, Excel and PowerPoint), MATLAB, Origin, Image J, Adobe Photoshop, 3ds Max, GraphPad Prism.
- *Technical:*
  - Able to work with electrochemical devices, such as Autolab, Parstat, Ivium, …
  - Familiar with electrochemical Techniques such as Electrochemical Impedance Spectroscopy, Cyclic Voltammetry, Potentiodynamic Tests, Chronoamperometry, Mott-Schottky Analysis.
  - English language fluency (MCHL, MSRT and Tolimo certificate)
- *Certificates:*
  - Environmental Health and Safety/ Introduction to Biosafety, McGill University, Expiration date, Sep 2021.

- Workplace Hazardous Materials Information System (W.H.M.I.S.) 2015, McGill University, Expiration date, Sep 2021.
- Hazardous Waste Management & Disposal for Laboratory, McGill University, Expiration date, Sep 2021.

Interests:

- *Research interests:*

  Biosensing, Electrochemistry, Nanomaterials, Biomaterials, Surface modification

References:

- Hojatollah Vali, Professor of Anatomy and Cell biology department of McGill University, Montreal, Canada, (+1) 5144633025, e-mail: hojatollah.vali@mcgill.ca
- Fathallah Karimzadeh, Professor of Materials Engineering at Isfahan University of Technology, Isfahan, Iran, Phone: (+98) 3133915744, e-mail: karimzadeh-f@cc.iut.ac.ir
- Keyvan Raeissi, Professor of Materials Engineering at Isfahan University of Technology, Isfahan, Iran, Phone: (+98) 3133915724, e-mail: k_raeissi@cc.iut.ac.ir