

Azadeh Sepahvandi

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SKILL SUMMARY:

- Biomedical Engineering Research: 10+ years of extensive exposure to Biomedical Engineering; Extensive background in soft tissue mechanical characteristics; Extensive background in biomaterials and biophysics; Experience in 3D printing; Extensive experience in optics; Experience in bioceramic drug delivery systems; Experience in genetics and gene therapy; Experience in nanoparticle applications; Experience in bone implants; working knowledge in cell signaling; Working knowledge in biomimetic; Excellent analytical and review writing skills.
- Tissue Engineering Research: Extensive background in Retinal tissue engineering; Experience with electrospun scaffolds; Experience with Cartilage tissue engineering; Experience in hydrogel scaffolds; Strong knowledge in Retinal tissue engineering and tissue regeneration.
- Cell Work: Cell culture(mesenchymal stem cells (MSCs)and retinal pluripotent cells(RPCs)); 3D culture of cells in synthetic and natural hydrogels; Stem cell differentiation to chondrogenic, osteogenic and vasculogenic lineages; RNA, DNA and protein extraction; Immunofluorescent staining of cells in 2D and 3D cultures.
- Analyzing work: Atomic Force Microscopy(AFM) imaging;Optical coherence tomography(OCT) imaging; Espectophotometry; Rheological testing;Fluorescence microscopy imaging; flowcytometry; Experience in western blotting and nanodrop; RT-PCR and data analysis; biochemical assays.
- Language Skills: Persian (Native), English (Fluent).
- Computer Skills: Expert in Microsoft Office (Word, Excel, and PowerPoint), MATLAB, C++ and CREO Parametric.

EDUCATION:

Doctor of Biomedical Engineering/Biomaterials,2016

Polytechnic University, Tehran, Iran.

Thesis: analyzing the effect of luminescence nanoparticles on retinal tissue engineering.

Master of Biomedical engineering / Biomaterials, 2010

Polytechnic University, Tehran, Iran.

Thesis: Detecting the formation of calcium phosphate Nano layer in biomimetic method.

Bachelor of Biomedical Engineering/ Biomaterials, 2007

Polytechnic University, Tehran, Iran.

Thesis; Designing an antibody HIV rapid test.

EMPLOYMENT HISTORY:

Research Specialist, 12/2009 – 06/2011

Employer: National Institute of Genetic Engineering and Biotechnology(Tehran-Iran).

- Researched human mesenchymal stem cell (MSCs)

Consultant of creativity in master theses, 08/2013 – 08/2015

Employer: Medical engineering department of Amirkabir University of Technology(Tehran – Iran).

- Advising master students for novel thesis ideas

Patent review expert, 10/2015 – 08/2016

Employer: Iranian research organization for science and technology (IROST) (Tehran – Iran).

- Evaluating the patent proposals (In medical engineering)

Postdoctoral researcher, 08/2017 – 08/2020

Employer: University of South Carolina

- Researched Cartilage tissue engineering

Instructor, 12/2020 - Present

Employer: University of South Carolina – Mechanical Engineering Department

- Teaching CAD, Lab II, and Thermodynamics.

Engineering TRAINING and TEACHING:

- **Training**

Chemistry University of Florence, Florence, Italy

- **International Workshop on Expression, Structure and Function of Membrane Proteins Florence, 2009**

Michigan State University, Ann Arbor,USA

- **16th International Congress on Luminescence, 2011**

University of South Carolina, Columbia,USA

- **3D Cell work, 2017**

- **Teaching**

Biomedical Engineering Department of Amirkabir University of Technology, Tehran, Iran

- **Creativity in medical engineering, Ungraduated students, (2012 – 2015)**

Biomedical Engineering Department of Amirkabir University of Technology, Tehran, Iran

- **Biophysics, Ungraduated students, (2012 – 2013)**

Biomedical Engineering Department of Amirkabir University of Technology, Tehran, Iran

- **Cell signaling, Graduate students, 2014(TA)**

Biomedical Engineering Department of Amirkabir University of Technology, Tehran, Iran

- **Tissue Regenerating, Graduate students, (2015-2016)(TA)**

University of South Carolina, Columbia, USA

- **Biomaterials, Ungraduated students, 2018(TA)**

University of South Carolina, Columbia, USA

- **Tissue Engineering, Ungraduated students, 2019(TA)**

Mechanical engineering department of University of South Carolina, Columbia, SC

- **Computer Aided Design (CAD), (From 2021)**

Mechanical engineering department of University of South Carolina, Columbia, SC

- **Thermodynamics (From 2021)**

Mechanical engineering department of University of South Carolina, Columbia, SC

- **Lab II (From 2021)**

CERTIFICATIONS:

Best PhD Theses among all university majors, 2016

Amirkabir University of Technology

Top Ten Winners IBRIDGES Berlin Innovation Festival, 2015

IBRIDGE Innovation, Berlin, Germany

Iran Nanotechnology Initiative Council scholarship, 2013

Iran Nanotechnology Initiative Council

3rd ranked among all fellow under students in the Biomedical Engineering program, 2012

Amirkabir University of Technology

Ranked 101 Among One Million Participants in the National Exam, 2006

Iranian Nationwide Universities

SCIENTIFIC PATENTS:

Use of SrAl₂O₄:Eu,Dy luminescence particles in retina tissue regeneration, 2020

U.S Patent 10,569,100

Use of SrAl₂O₄:Eu,Dy luminescence particles for bone regeneration, 2016

Estate Registration Organization of Iran Patent

Use of SrAl₂O₄:Eu,Dy luminescence particles for skin regeneration, 2015

Estate Registration Organization of Iran Patent

Cold and warm soothing eye glasses, 2012

Estate Registration Organization of Iran Patent

Early detection of coated hydroxyapatite on titanium implants by photoluminescence properties, 2011

Estate Registration Organization of Iran Patent

OTHER RELATED EXPERIENCE :

Volunteer

- **Imaging adult patients limbus,2015**

Farabi Hospital, Tehran, Iran

- **Development of a Iran Smell Identification Test (Iran-SIT), 2014**

Amir Alam Hospital, Tehran, Iran

CONFERENCE PAPERS:

- Mana Yasaeia, Maryam Ghaffaria*, Ali Zamaniab, Fatollah Moztarzadeha, **Azadeh Sepahvandi.**" A Characterization of calcium hydroxide cements modified by addition of nanohydroxyapatite", 4th International Conference on Nanostructures (ICNS4). 2012, Kish Island, Iran.
- **Azadeh Sepahvandi.**, F.Moztarzadeh, M.Mosafari, M.Ghaffari. " Early detection of coated hydroxyapatite on titanium implants by photoluminescence properties ", Nano Technology Iranian Student Conference".2012, Tehran, Iran.
- **Azadeh Sepahvandi**, F.Moztarzadeh, M.Mosafari, M.Ghaffari. "Photoluminescence in the characterization and early detection of biomimetic bone-like apatite formation on the surface of alkaline-treated titanium implant", Euromat 2011,Paris,France.
- **Azadeh Sepahvandi**, F.Moztarzadeh, M.Mosafari, M.Ghaffari. "Photoluminescence in the characterization and early detection of biomimetic

bone-like apatite formation on the surface of alkaline-treated titanium implant", 8th Iranian Ceramic Congress .2011, Tehran, Iran.

- Masoud Mozafari ,F.Moztarzadeh, **A.Sepahvandi**, M.Ghaffari, S.Naghavi Alhosseini. "Self-assembly of PbS hollow spheres with strong photoluminescence properties via gas-bubble technique", 16th International Conference on Luminescence Ann Arbor,(Oral lecture at Ann Arbor), 2011, Ann Arbor,USA.
- Fathollah Moztarzadeh, Masoud Mozafari, **Azadeh Sepahvandi**, M,Ghaffari, SanazNaghavi Alhosseini." Controllable synthesis and luminescence properties of novel PbS/gelatin core- shell quantum dots for biomolecular recognition", 16th International Conference on Luminescence Ann Arbor.2011, Ann Arbor, USA.

SELECTED PUBLICATIONS:

- **Azadeh Sepahvandi and Esmail Jabbari**, "Decellularized Articular Cartilage Microgels as Microcarriers for Expansion of Mesenchymal Stem Cells", Gels, 2022.
- **Azadeh Sepahvandi**, M.monavarian, S.Kader, E. Jabbari. "Decellularized Articular Cartilage Microparticles for Expansion of Mesenchymal Stem Cells and Zonal Regeneration of Articular Cartilage".Biorxiv, 2021.
- **Azadeh Sepahvandi**, M.Ghaffari, B.Butler, M.Mozaffari. "COVID-19: insights into virus–receptor interactions", Molecular biomedicine, 2021.
- **Azadeh Sepahvandi**, F.Moztarzadeh, M. Eskandari. "Drug delivery systems to the posterior segment of the eye: Implants and Nanoparticles (Review)",Bionanoscience. 2016, 276-283.
- **Azadeh Sepahvandi**, M.Eskandari, F.Moztarzadeh. "Fabrication and characterization of SrAl₂O₄: Eu²⁺+Dy³⁺/CS-PCL Electrospun Nanocomposite Scaffold for Retinal Tissue Regeneration", material science and engineering C: Materials for Biological Applications. 2016, 306-314.
- **Azadeh Sepahvandi**, M.Eskandari, F.Moztarzadeh. "Photoluminescence and decay characteristics of PEGilated long lasting nanophosphors for tissue engineering applications", Biointerface Research in Applied Chemistry. 2016, 78-90.
- **Azadeh Sepahvandi**, F.Moztarzadeh, M.Mozafari, M.Ghaffari. "Photoluminescence in the characterization and early detection of biomimetic bone-like apatite formation on the surface of alkaline-treated titanium implant", State of the art, Colloids and Surfaces B: Biointerfaces In Press. 2011, 390-396.
- Maryam Ghaffari, F.Moztarzadeh, **A.Sepahvandi**, M.Mosafari, Sh.Faghihi. "How bone marrow-derived human mesenchymal stem cells respond to poorly

crystalline apatite coated orthopedic and dental titanium implants”, Ceramics International. 2013, 7793-7802.

- Book of "Retinal Tissue Engineering" ,Professor moztarzadeh and Dr Sepahvandi ,2017, Amirkabir University of Technology Publication.