

PERSONAL  
INFORMATION

Ima Ghaeli (Iranian and Portuguese Nationality)

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SUMMARY

An experienced biomedical engineer with solid research background in biomaterials, biopolymers, surface coating, antibacterial substrates, drug delivery and tissue engineering. My research activities have been mainly focused on designing of smart biomaterials for various applications such as tissue engineering, drug delivery, and food engineering. Currently, I am working on nearfield effects for sensing and bioimaging, aiming at improving the scanning speed of a super resolution “metal induced energy transfer–fluorescence lifetime Imaging” (“MIET-FLIM”) microscope. Having creativity and engineering detective skills, and with the means of sophisticated instruments, I can detect the reasons behind the facts, connect the facts, find novel ways and create new products based on market needs.

**Research Interest:** Protein-based biomaterials, Smart biomaterials for biomedical applications, Super resolution microscopy, Drug delivery, Wound dressing, Antibacterial surfaces, Viral Nanoparticles.

EDUCATION	
September 2011-April 2018	<p>Ph.D student in Biomedical Engineering</p> <p>Faculdade de Engenharia, Universidade do Porto, Departamento de Engenharia Metalurgia e Materiais, Porto, Portugal</p> <ul style="list-style-type: none"><li>• <i>Dissertation title:</i> Developing Antimicrobial Collagen/Silk Fibroin Biocomposites with Immobilized Phages</li></ul>
September 2006-February 2009	<p>Master of Science in Polymer Chemistry and Fiber science</p> <p>Department of Textile Engineering, Isfahan University of Technology, Iran</p> <ul style="list-style-type: none"><li>• <i>Dissertation title:</i> Comparison changes in average molecular weight of</li></ul>

	Polyethylene Terephthalate by solid state polymerisation and chain extension methods
September 2001-February 2006	<p><b>Bachelor of Science in Polymer Chemistry and Fiber Science</b></p> <p>Department of Textile Engineering, Isfahan University of Technology, Iran</p> <ul style="list-style-type: none"> <li>• <i>Dissertation title:</i> FTIR study and statistical analysis of the hydrolytic/thermal degradation of Polyethylene Terephthalate fibers</li> </ul>
<b>PROFESSIONAL EXPERIENCE</b>	
16 November 2018-Now	<p><b>Research Fellow</b></p> <p>Ultrafast Bio- and Nanophotonics group (Dr. Jana B. Nieder), INL (International Iberian Nanotechnology Laboratory), Braga, Portugal</p> <p style="text-align: center;">Project: NearField Effects for Sensing and Bioimaging</p> <p><i>Summary:</i> The research goal is to improve the scanning speed of a super resolution “Metal Induced Energy Transfer – Fluorescence Lifetime Imaging” (“MIET-FLIM”) microscope setup to allow live cell super resolution microscopy.</p>
October 2018-mid November 2018	<p><b>Research Investigator</b></p> <p>Departamento de Engenharia Química (Dr. Arménio Serra), Universidade de Coimbra, Coimbra, Porgual</p> <p style="text-align: center;">Project: Flexmodulo – Synthesizing a potential compatibilizer for PP/PET blends</p> <p><i>Summary:</i> I worked in collaboration with University of Coimbra on preparing a manuscript for Flexmodulo Project, with the goal of synthesizing a novel compatibilizer for Polypropylene (PP)/ Polyethylene terephthalate (PET) blend</p> <p>Responsibilities:</p> <ul style="list-style-type: none"> <li>• Analyzing and interpreting data on the synthesized compatibilizers, including: NMR, TGA, FTIR</li> <li>• Analyzing and interpreting data on compatibilizer/PP/PET blend, including: Torque processing, FTIR, TGA, DMTA, DSC, Tensile and mechanical strength</li> </ul>

<p>February 2017-March 2018</p>	<p>Working independently with the idea of healthcare products:</p> <ul style="list-style-type: none"> <li>• Learning the components and knowledge of grant writing; training proposal writing with the help of potential academic partners; writing and submitting proposals for European grants such as ESCMID research grant (2017) and Instruct Pilot R&amp;D project (2017), and JPIAMR (2018) with the aim of fabricating antibacterial surfaces based on biomaterials to combat infection diseases.</li> <li>• Looking for scientific collaborative partners who seek for novel alternative methods to combat disease associated antibiotic-resistant bacteria</li> </ul>
<p>March 2012-April 2018</p>	<p><b>Research Investigator</b></p> <p>INEB (Instituto de Engenharia Biomédica) and i3S (Instituto de Investigação e Inovação em Saúde), Universidade do Porto, Portugal</p> <p>Project: Fabrication of biocomposites containing collagen/silk fibroin for biomedical applications</p> <p><i>Summary:</i> The research focus was on the methods to mixing two biomaterials of collagen and silk fibroin with the aim of preserving the natural structures for both materials. The developed method could be a promising novel technique for production of biocomposite films for a wide range of biopharmaceutical applications. Scientific research was supported by FEDER funds through COMPETE (POCI/01/0145/FEDER/007265) and by Portuguese funds through FCT under the partnership agreement PT2020 UID/QUI/50006/2013</p> <p>Responsibilities:</p> <ul style="list-style-type: none"> <li>• Fabricating biocomposite coatings and scaffolds containing protein-based polymers</li> <li>• Physicochemical Characterization analysis of the biocomposite materials through: Fourier transform infrared spectroscopy (FTIR), Scanning electron microscopy (SEM), Thermogravimetric analysis (TGA), Dynamic Mechanical Analysis (DMA), Differential Scanning Calorimetry (DSC), Contact angle analysis, Zeta potential, Circular dichroism (CD) spectroscopy, Cell culture techniques, Tracking nanoparticles using MATLAB.</li> <li>• Limited working experience with mixtures of Carbon fibers, collagen and chitosan</li> <li>• Writing articles and developing new ideas for novel projects</li> </ul>

<p>March 2015-August 2015</p>	<p><b>Visiting Scientist</b></p> <p>Biocolloids and Surface Laboratory (Professor Nathalie Tufenkji), McGill University, Quebec, Canada</p> <p>Project: Development of antibacterial biocomposite surfaces through bacteriophage immobilization technique</p> <p><i>Summary:</i> The project was focused on different techniques to incorporate phage virus nanoparticles into the biomaterials. The goal was to make antibacterial surfaces that could retain their bioactivity within an identified period of time. The outcome was a simple and cost effective technique that could be a promising basis for extensive future research on various pharmaceutical applications. Furthermore, a novel label-free technique has been developed to track phage viral nanoparticles in aqueous solutions that could provide insights for inferring phage-based structures under various conditions.</p> <p>Responsibilities:</p> <ul style="list-style-type: none"> <li>• Exchanged research knowledge and projects</li> <li>• Bacteriophage purification and propagation</li> <li>• Tracking of phage viral nanoparticles in aqueous solutions through dark-field enhanced microscopy</li> <li>• Designing and fabricating methods to immobilize bacteriophages onto the biomaterial surfaces</li> <li>• Analyzing and characterizing the bioactivity of phage-immobilized surfaces, such as biofilm formation, planktonic growth, life/dead staining and Fluorescence microscopy</li> <li>• Cytocompatibility analysis of phage-immobilized biocomposites using mesenchymal stem cells.</li> </ul>
<p>June 2014</p>	<p><b>Visiting Scholar</b></p> <p>Biomaterials and Cosmetics Department (Professor Alina Sionkowska), Nicolaus Copernicus University, Toruń, Poland</p> <p>Project: Analysis the miscibility behaviour of Collagen/Silk fibroin blend through viscosimetric technique</p> <p><i>Summary:</i> The project focus was on analyzing the phase behavior of collagen/silk fibroin through viscosimetry analysis. The influence of divalent salt ions on the ionic strength of the mixtures and consequently the coacervation or precipitation has been assessed. Scientific research was supported by Short Term Scientific Mission (STSM- COST Action MP1301)  <a href="http://www.cost-newgen.org/wp-content/uploads/2015/05/Ima-Ghaeli-Report-for-STSMfinal.pdf">[http://www.cost-newgen.org/wp-content/uploads/2015/05/Ima-Ghaeli-Report-for-STSMfinal.pdf]</a></p>

	<p>Responsibilities:</p> <ul style="list-style-type: none"> <li>Analyzing the miscibility behavior of collagen/silk fibroin blend through viscosimetric technique</li> </ul>
<p>March 2013-June 2013</p>	<p><b>Visiting Scholar</b></p> <p>LIQUIP Laboratory (Professor Marisa Masumi Beppu), Faculdade de Engenharia Quimica, UNICAMP, Campinas (SP), Brazil</p> <p>Project: Preparation technique of silk fibroin and its blends with natural proteins</p> <p><i>Summary:</i> The project focus was on silk fibroin extraction from B. mori cocoons. The technique for mixing two biomaterials of collagen and silk fibroin with different mixing ratios, has been developed. The phase behavior of mixtures was analyzed through ternary phase diagram. The scientific research was supported by FCT/CAPES program.</p> <p>Responsibilities:</p> <ul style="list-style-type: none"> <li>Silk fibroin extraction and blending with various biomaterials</li> <li>Limited working with layer-by-layer polyelectrolyte deposition technique</li> <li>Physicochemical characterization of blended materials with Scanning electron microscopy (SEM) and differential scanning calorimetry (DSC)</li> </ul>
<p>November 2011-February 2012</p>	<p><b>Research Investigator</b></p> <p>CDRSP- Centre for Rapid and Sustainable Product Development (Professor Geoffrey Mitchell), Leiria, Portugal</p> <p>Project: Modification of electrospinning device to produce oriented nanofibers</p> <p><i>Summary:</i> The project focus was on the electrospinning procedure in order to provide PCL nanofibers. The main goal was modification of electrospinning device to produce oriented nanofibers.</p> <p>Responsibilities:</p> <ul style="list-style-type: none"> <li>Working on the electrospinning unit</li> <li>Working with bioextrusion system for fabrication of scaffolds through layer-by layer technique</li> </ul>

<p>June 2009-June 2011</p>	<p>R&amp;D Project Manager, Alyaf Sazan Behkoosh Company, Isfahan, Iran</p> <p><i>Summary:</i> Alyaf Sazan Behkoosh is one of the largest yarn manufacturing companies in Iran. Their products are Polyester (various kinds), air textured and polypropylene yarns.</p> <p>Responsibilities:</p> <ul style="list-style-type: none"> <li>• Feasibility study of establishing Acrylonitrile and Acrylic fibre units. The focus was on preliminary analysis including description of production process and steps of manufacturing, key national investment priorities, market analysis, site analysis, competitor analysis, price analysis and pricing policies, production capacity, technical required analysis (such as land, and equipment), licensing process and costs</li> <li>• Contributing significantly to the improvement of the production process of Polyester (melt spinning machinery), Polypropylene and Air Textured yarns</li> <li>• Working in close collaborations with the experts from SSM - Schärer Schweiter Mettler AG (Switzerland), India and China, with Textile Machinery Instalment</li> <li>• International sales experience with suppliers of textile products and machineries</li> </ul>
<p>February 2009-June 2010</p>	<p>Teaching assistant</p> <p>Polymer laboratory (Professor Ali Zadhoush), Department of Textile Engineering, Isfahan University of Technology, Iran</p> <p>Responsibilities:</p> <ul style="list-style-type: none"> <li>• Teaching Polymer Chemistry Lab course, including various methods of polymerization, characterization of polymers, modification and application of polymers to reach the final intended applications</li> </ul>
<p>September 2007-June 2009</p>	<p>Laboratory Technician and research assistant</p> <p>Department of Textile Engineering, Isfahan University of Technology, Iran</p> <p>Responsibilities:</p> <ul style="list-style-type: none"> <li>• Technician of FTIR Laboratory (under supervision of Professor Ali Zadhoush), technical and data analysis, collaborating on various projects with interpreting results through FTIR analysis</li> <li>• Collaborating in several research projects on polymers and fibers, experimental analysis and writing scientific articles</li> <li>• Limited collaboration on industrial projects</li> </ul>

## PERSONAL SKILLS

Languages	<p><i>Persian:</i> Mother tongue</p> <p><i>English:</i> Fluent (IELTS General 7 out of 9, 2017)</p> <p><i>Portuguese:</i> Upper Intermediate – B2</p> <p><i>French:</i> Basic</p> <p><i>Arabic:</i> Basic</p>
Communication skills	Team player, Hard-Working, Innovative thinking to adjust in any type of work environment, Quick-learner, Potential supervisor, Excellent networking skills, Caring and responsible attitude
Additional skills	<ul style="list-style-type: none"> <li>• Good in analytical skills</li> <li>• Ability to work under pressure</li> <li>• Stock exchange market</li> </ul>

## PUBLICATIONS AND CONFERENCES

Journal Papers	<ul style="list-style-type: none"> <li>• I Ghaeli, Z Hosseinidoust, H. Zolfagharnasab, FJ Monteiro, “A new label free technique for analysing evaporation induced self-assembly of viral nanoparticles based on enhanced darkfield optical imaging”, <i>Nanomaterials</i>, 8 (1), 1, 2018.</li> <li>• I Ghaeli, MA de Moraes, MM Beppu, K Lewandowska, A Sionkowska, F Ferreira-da-Silva, MP Ferraz, FJ Monetiro, “Phase behaviour and miscibility studies of collagen/silk fibroin macromolecular system in dilute solutions and solid state”, <i>Molecules</i>, 22(8) (2017), 1368. Collaborations among Portugal, Brasil and Poland.</li> <li>• M. Sheikhzadeh, I. Ghaeli, E. Pirzadeh, F.Bateni, “The effect of hydrolytic and thermal degradation on mechanical properties of industrial polyester yarns”, <i>Journal of Applied Polymer Science</i>, 116(4) (2010) 1929-1932.</li> <li>• Zadhoush, M. Esmaeili, I. Ghaeli, “Crosslinking of plasticized PVC used in coated fabrics”, <i>Journal of Vinyl and Additive Technology</i>, 15 (2009) 108-112.</li> <li>• M. Ghane, M. Sheikhzadeh, S. Khaburi, I. Ghaeli, “An investigation on the ratio of bending rigidity of fabric to yarn for low twist filament yarn”, <i>Journal of Fibers &amp; Textiles in Eastern Europe</i>, 74(3) (2009) 51-53.</li> </ul>
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## Conference papers

- “Bacteriophage-based materials as solutions for skin health care”, 1st German Phage Symposium, Oct 2017, Stuttgart, Germany
- I Ghaeli, MA Moraes, M Beppu, FJ Monteiro, MP Ferraz, “Physicochemical properties of collagen/silk fibroin films”, International Symposium on Surface and Interface of Biomaterials (ISSIB), September 24-28, 2013, Roma, Italy.
- Hassanabadi, M. Hassanzadeh, I. Ghaeli, Energy saving potentials in ventilation system of spinning factories using inverters, 8th National Conference of Textile Engineering, Yazd University, Iran, 2012.
- A. Valipouri, AA Gharehaghaji, SA Hosseini, I Ghaeli, F Dabirian, “An investigation on the moisture regain and mechanical properties of electrospun hybrid yarns including porous Poly L Lactic Acid and Poly Vinyl Alcohol”, Nanocon Conference, Czech Republic, 2011
- Zadhoush, E. Pirzadeh, I. Ghaeli, M. Haghighat, “FTIR study and statistical analysis of the hydrolytic/thermal degradation of Poly (ethylene terephthalate) fibers”, 1th Advanced Textile Materials & Manufacturing Technology (ATMMT) Conference, Hangzhou, China, 2008.