

# Muhammad Qasim



<https://scholar.google.com/citations?user=NavQ0LgAAAAJ&hl=en>



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## About Me:

I am from Pakistan, completed my PhD in Nano Bioengineering from Chung Ang University Seoul South Korea in 2015. Currently I am working as postdoctoral fellow at University of Otago, New Zealand. As a volunteer I am working as Young Leader Asia Pacific Forum and CTBTO Youth, President of Broader Middle East and North Africa Association of Young scientists (BAYS) and UN major group for Youth and Children UNGMY, where I explore the role of science as a universal language to help break down barriers and build bridges between peoples and nations to solve complex international issues like Nuclear Non Proliferation and Disarmament, Bio-safety, Bio-security, Dual Use, Responsible Conduct of Science, One Health, Climate change, World Peace and Security. Previously I served at Gachon University, Konkuk University, Korea University and Ajou University South Korea as faculty member. I also worked with Pakistan Atomic Energy Commission, National AIDS Control Program (UNFA), National TB Control Program (NTP) and organized many research and scientific activities in collaboration with TWAS, BEP USA, LNCV Italy, ICLS, CSTSP AAAS. My area of research is Biochemistry and Molecular Biology, Tissue Engineering and Nano medicine, Infections diseases and drug developments. I am awarded with Asia Young Scientists Scholarship for PhD and various travel grants to attend scientific and high level policy meetings across 40 countries in the world including Biosafety and biosecurity international forum (BBIC) Jordan 2011, World Science Forum 2017, MISK global forum, CTBTO Science Diplomacy Symposium 2018 and CTBTO Science and Technology Conference 2017, Asia Pacific Forum Security Councils meetings in Malaysia, South Korea and Indonesia (2015-2019) and UNODA Biological weapons Conventions (BWC) meeting of Science Experts (MX2) Geneva Switzerland. I am author of two books chapter and 26 International journals articles with impact of 90 and citations of above 315. My writings have appeared in CTBTO News room, PACT news of pacific forum, English and Urdu language media

## Education:

2012-15

**Chung Ang University Seoul Korea**

PhD in BioEngineering

Thesis: Synthesis of Polymeric nanoparticles and their applications for treatments of Infectious Diseases (Supervisor

Dr.Hansoo Park)

Asian Young Scientist Scholarship (CYASS)

**CGPA 4.29/4.5 (97.6 %)**



2009-11

**Quaid-i-Azam University Islamabad Pakistan**  
M.Phil in Biochemistry & Molecular Biology  
Thesis: Molecular Characterization and Phylogenetic Analysis  
of High Risk Human Papilloma Virus (HPV) (Supervisor Dr.  
Zeeshan Hyder  
**CGPA 3.7/5 (77%)**



2007-2009

**PMAS Arid Agriculture University Rawalpindi Pak**  
M.Sc in Biochemistry  
**CGPA 3.0/ 4.0 (65%)**



## Professional Certificates

- **Master level course in Biosafety, Biosecurity & Dual Use education**  
Bradford University, UK (2011-12)
- **Post Graduate Diploma In Public Health**  
86.5%, 1<sup>st</sup> Div' Pakistan Institute of Modern Sciences, Skill development council Islamabad
- **ISO 15189 the International Standard for Medical Lab**
- **Challenges of new genetic techniques for biosafety**
- **Sustainable and Safe laboratories**
- **WHO Course on Survey Research**



## Publications

### • Book

1. **"An introduction to biorisk management and dual use in life sciences"** Zabta K. Shinwari, Giulio M. Mancini, Kathryn McLaughlin, William Pinard, LouAnn Burnett, Anwar Nasim, Aamer Ikram, Abdullah, **Muhammad Qasim**, Alessandro Fasani Edited and Printed in Como (Italy), Islamabad (Pakistan), and Albuquerque (United States) in 2011

Available Online at: <http://english.ibp.cas.cn/rh/lss/201212/P020121203585419387428.pdf>

2. Chapter 38: **Effect of Scaffolds with Bone Growth Factors on New Bone Formation** Hae-Ryong Song, Swee-Hin Teoh, Hak-Jun Kim, Ji-Hoon Bae, Sung Eun Kim, Young-Pil Yun, **Muhammad Qasim**, Jerry Chan, Zhi-Yong Zhang, Chang-Wug Oh, and Jun-Ho Wang. Handbook of Intelligent Scaffolds for Tissue Engineering and Regenerative Medicine, 2nd Edition (2017) Pages 1113-1173. <http://www.panstanford.com/books/9789814745123.html>. Published May 2017. eBook Published 26 June 2017 Pub. location New York Imprint Pan Stanford Pages 1480 pages eBook ISBN9789814745130 <https://www.taylorfrancis.com/books/e/9789814745130>

### Grants:

- WHO EMRO-COMSTECH research grants of worth 30000 USD on TB-HIV Coinfection Collaborative proposal on characterization of mutations associated with first and second line anti-TB drugs in patients co-infected with HIV and TB" RAB&GH 10-11/25
- KU research Professor Brain Korea National Research Foundation Grant 50000 USD "Development of Brain on Chip" 2015-2018 (2015R1A5A1009701)
- National Research Foundation of Korea (NRF-2017R1C1B5017159) and the Ministry of Health & Welfare, Republic of Korea (HI18C0661) 100,000 USD "Bio-scaffold for cartilage and bone Tissue Engineering
- Otago@ag Research Grant of 5000 NZD

### Scholarships and Travel Grants:

- Master Merit Scholarship, Quaid I Azam University, Islamabad (2009-11)
- Bioengagement Program (BEP), USA Bursary Scholarship for Six months' online diploma of Dual Use Education from Bradford University UK. (2011)
- American Association for Advancement of Sciences (AAAS) Travel Grant to attend Conference in Tunisia (2011)
- International Council for Life Sciences (ICLS) travel grant to attend conference in Jordan (2011)
- Chung Ang University Asian Young Scientists Scholarship for PhD (2012-15)
- Travel grant by Young Leader Asia Pacific Young Leader Forum 2015
- Award of Travel Grant by American Association for Advancement of Sciences (AAAS) to attend conference in Austria 2015
- Travel Grant Comprehensive Nuclear Test Ban Treaty Organization (CTBTO) Youth group. 2016
- Award of Travel Grant by The Comprehensive Nuclear Test Ban Treaty Organization (CTBTO) Youth group in Austria 2017
- Travel grant by Young Leader Asia Pacific Young Leader Forum 2017
- US National Academy of Science Engineering and Medicine Travel Grants (2018)
- Award of Travel Grant by The Comprehensive Nuclear Test Ban Treaty Organization (CTBTO) Youth group in Austria 2018
- Travel grant by Young Leader Asia Pacific Young Leader Forum 2018
- UNODA travel Award 2019
- Travel grant by Young Leader Asia Pacific Young Leader Forum 2019

#### • Govt Public Projects PC-1

I developed the PC-1 (2009-14) for “National Safe blood transfusion services Project” National AIDS Control Program Ministry of Health Pakistan

#### • Patents

1. pNIPAM nanogels with NH<sub>2</sub> surface Charge for enhancing drug solubility (P14-B063) 10-2014-0036072, South Korea
2. PVA based water stable nanofibrous membrane for cell culture and tissue engineering application (Patent Number. 10-1665918), South Korea

#### • Supervision

- BS Students (25)
- MS Students (05)
- PhD (Co-Supervise 02)

#### • Research Paper (Total Impact Factor: 70)

1. *“Nanotechnology for Diagnosis and Treatment of Infectious Diseases”* **Muhammad Qasim**, Dong-Jin Lim, Hansoo Park and Dokyun Na J. Nanosci. Nanotechnol. 14 (10), 7374-7387 (2014) ISSN: 1533-4880 (Print); EISSN: 1533-4899 (Online) October 2014 (**IF 1.55**)
2. *“Enhanced Antifungal Activity of Amphotericin B with Poly N-Isopropylacrylamide (pNIPAM) based nanogels against Candida albicans”* **Muhammad Qasim**, Phornsawat Baipaywad, Nopphadol Udomluck, Dokyun Na, and Hansoo Park. J of Macromolecular Research October 2014, Volume 22, Issue 10, pp 1125-1131 ISSN:1598-5032(print version) ISSN:2092-7673 (electronic version) (**IF 1.597**)
3. *“Molecular diagnosis and phylogenetic analysis of human papillomavirus type-16 from suspected patients in Pakistan”* Abdullah Abdullah, **Muhammad Qasim**, Muhammad Shafiq, Muhammad Ijaz, Shamsa Parveen, Shahnaz Murtaza, Qamar Javed, Salman Akbar Malik, Shahida Husain Tarar, Sajid Mehmood, Abdul Sami, Syed Muhammad Saqlain Naqvi and Muhammad Zeeshan Hyder. *Infectious Agents and cancer* 2016,**11-1** doi:10.1186/s13027-016-0047-z. ISSN 1750-9378 (**IF. 2.358**)

4. "Antimicrobial activity of silver nanoparticles encapsulated in poly-N-isopropylacrylamide-based polymeric nanoparticles" **Muhammad Qasim**, Nopphadol Udomluck, Hansoo Park, Kyobum Kim. International Journal of Nanomedicine, 2018;13 235-249 1176-9114 (print); 1178-2013 (web) <https://doi.org/10.2147/IJN.S153485> (IF: 4.5)
5. *Copy Number Profiling of MammaPrint Genes Showed Association with the Prognosis of Breast Cancer Patients*" Areej Fatima, Fiazan Abbasi, **Muhammad Qasim**, Faraz A Malik, Farhan Haq. Journal of Breast Cancer, Vol. 20; No. 3, 246–253 Sep 2017 <https://ejbc.kr/DOIx.php?id=10.4048/jbc.2017.20.3.246> pISSN 1738-6756 (IF: 2.20)
6. *Predictors of poor treatment outcomes in multidrug-resistant tuberculosis in Khyber Pakhtunkhwa, Pakistan: A retrospective cohort study*. Arshad Javaid, Irfan Ullah, Haleema Masud, Anila Basit, Waqas Ahmad, Zahid Ahmad Butt and **Muhammad Qasim** Clinical Microbiology and Infection, 09(23) 2017. <https://doi.org/10.1016/j.cmi.2017.09.012> . ISSN 1469-0691 (IF: 5.2)
7. *Cytotoxic potential and molecular pathway analysis of silver nanoparticles in human colon cancer cells HCT116*. Sangiliyandi Gurunathan, **Muhammad Qasim**, Chanhyeok Park, Hyunjin Yoo, Jin-Hoi Kim and Kwonho Hong *Int. J. Mol. Sci.* 2018, 19, 2269; doi:10.3390/ijms19082269 (IF 4.183)
8. *Nanoparticle-Mediated Combination Therapy: Two-in-One Approach for Cancer*. Sangiliyandi Gurunathan, Min-Hee Kang, **Muhammad Qasim** and Jin-Hoi Kim. *Int. J. Mol. Sci.* 2018,19(10), 3264; <https://doi.org/10.3390/ijms19103264> (IF 4.183)
9. *Cytotoxicity and Transcriptomic Analysis of Silver Nanoparticles in Mouse Embryonic Fibroblast Cells*. Sangiliyandi Gurunathan, **Muhammad Qasim**, Chan H Park, Hyunji Yoo, Dong Yoon Choi, Chankyu Park, Hyuk Song, Jin-Hoi Kim, Kwonho Hong. *Int. J. Mol. Sci.* 2018,19(11), 3618; <https://doi.org/10.3390/ijms19113618> (IF: 4.183)
10. *Comparative Genome Analysis of collagen gene diversity* Farhan Haq, Nabeel Ahmed **Muhammad Qasim**, 3 Biotech (2019) 9: 83. <https://doi.org/10.1007/s13205-019-1616-9> (IF: 1.53)
11. *3D printing approaches for cardiac tissue engineering and role of immune modulation in tissue regeneration*. **Muhammad Qasim**, Farhan Haq, Min-Hee Kim, Jin-Hoi Kim, International Journal of Nanomedicine 2019;14 1311–1333 <https://doi.org/10.2147/IJN.S189587> (IF: 4.5)
12. *Review of the Isolation, Characterization, Biological Function, and Multifarious Therapeutic Approaches of Exosomes*. Sangiliyandi Gurunathan, Muniyandi Jeyaraj Min-Hee Kim, **Muhammad Qasim**, Jin-Hoi Kim *Cells* 2019, 8(4), 307; <https://doi.org/10.3390/cells8040307> (IF 5.6)
13. *Cytotoxicity and Transcriptomic Analyses of Biogenic Palladium Nanoparticles in Human Ovarian Cancer Cells (SKOV3)*. Gurunathan, S.; **Qasim, M.**; Park, C.H.; Arsalan Iqbal, M.; Yoo, H.; Hwang, J.H.; Uhm, S.J.; Song, H.; Park, C.; Choi, Y.; Kim, J.-H.; Hong, K. *Nanomaterials* 2019,9, 787. <https://doi.org/10.3390/nano9050787> (IF:4.034)
14. *Phylogenetic analyses of human 1/2/8/20 paralogs suggest segmental duplications during animal evolution*. Farhan Haq. Usman Saeed.Rida Khalid. **Muhammad Qasim**. Maryam Mehmood. Biotech (2019) 9:233 <https://doi.org/10.1007/s13205-019-1768-7> (IF 1.5)
15. *Current research trends and challenges in tissue engineering for mending broken hearts*. **Muhammad Qasim**, Pala Arunkumar, Heather M. Powell, Mahmood Khana. Life Sciences 229 (2019) 233–250. <https://doi.org/10.1016/j.lfs.2019.05.012> (IF: 3.5)
16. *Advancements and frontiers in nanobased 3D and 4D scaffolds for bone and cartilage tissue engineering*, **Muhammad Qasim**, Dong Sik Chae, Nae Yoon Lee. International Journal of Nanomedicine 2019;14 4333-4351. <https://doi.org/10.2147/IJN.S209431> (IF 4.5)
17. *Evaluation of Graphene Oxide Induced Cellular Toxicity and Transcriptome Analysis in Human Embryonic Kidney Cells*. Sangiliyandi Gurunathan, Muhammad Arsalan Iqbal, **Muhammad Qasim**, Chan Hyeok Park, Hyunjin Yoo, Jeong Ho Hwang, Sang Jun Uhm, Hyuk

- Song, Chankyu Park, Jeong Tae Do, Youngsok Choi, Jin-Hoi Kim and Kwonho Hong *Nanomaterials* **2019**, 9(7), 969; <https://doi.org/10.3390/nano9070969> (IF 4.034)
18. **Bioengineering strategies for bone and cartilage tissue regeneration using growth factors and stem cells.** **Muhammad Qasim**, Dong Sik Chae, Nae Yoon Lee. *J Biomed Mater Res.* 2019;1–18. <https://doi.org/10.1002/jbm.a.36817> (IF 3.5)
  19. **A Comprehensive Review on the Synthesis, Characterization, and Biomedical Application of Platinum Nanoparticles** Muniyandi Jeyaraj, Sangiliyandi Gurunathan, **Muhammad Qasim**, Min-Hee Kang and Jin-Hoi Kim *Nanomaterials* **2019**, 9(12), 1719 <https://doi.org/10.3390/nano9121719> (IF 4.034)
  20. **Modulation of Immune responses with nanoparticles and reduction of their immunotoxicity.** **Muhammad Qasim**, Yeonwoo Jang, Shin Hyuk Kang, James Moon, Won Jong Kim and Hansoo Park: *Biomater. Sci.*, 2020, **8**, 1490-1501
  21. **Nanohybrid biodegradable scaffolds for TGF- $\beta$ 3 release for the chondrogenic differentiation of human mesenchymal stem cells.** **Muhammad Qasim**, Dong Sik Chae, Nae Yoon Lee. *International Journal of Pharmaceutics* <https://doi.org/10.1016/j.ijpharm.2020.119248> (IF 4.5)
  22. **Fabrication of polycaprolactone nanofibrous membrane-embedded microfluidic device for water filtration.** **Muhammad Qasim**, Dong Sik Chae, Nae Yoon Lee. *Journal of Applied Polymer Science.* <https://doi.org/10.1002/app.49207> (IF 2.5)
  23. **Analysis of the Worldwide Corona Virus (COVID-19) Pandemic Trend; A Modelling Study to Predict Its Spread.** **Muhammad Qasim**, **Muhammad Waqas** doi: <https://doi.org/10.1101/2020.03.30.20048215> (02/04/2020)
  24. **COVID-19 Disease Modelling and Its Impact on Public Health Policy**, Muhammad Qasim, waqas Ahmad, Muhammad Azhar, mohammad Azam, *IEEE Future Directions News Letter*, May 2020.
  25. **Data model to predict prevalence of COVID-19 in Pakistan.** Muhammad Qasim, PhD; Muhammad Waqas, MS; Shenghuan Zhang, MS; Muhammad Yasir, PhD; Muhammad Azhar, PhD, Accepted in *Data in Brief*.
  26. **Early epidemiological and clinical manifestations of COVID-19 in Japan.** Muhammad Qasim, Waqas Ahamad, Minami Yasuda, Maree Gould. , Submitted *Journal of BMC clinical infections*
  27. **Comparative Study of Blood Glucose Collection Methods at PSMMC**. Samia Hassan Sobki, Khalid Suleiman Al Grooni, Tarik Anwar, **Muhammad Qasim**. *European Journal of Biotechnology and Bioscience* 2014; 1 (4): 06-11 ISSN: 2321-9122
  28. **Water-stable and semitransparent electrospun poly(vinyl alcohol) nanofibers for cell culture.** **Muhammad Qasim**, Danbi Park, Jeong-Min Kim, Ji-Yeon Park, Asad Ali, Jong-Yong Kwak (Submitted to *Advanced Health Care Materials*, IF 5)
  29. **A novel transparent, smart and colorimetric silver nanoparticles (AgNP) imbedded nanocomposite PVA-PAA hydrogels for wounds dressing.** **Muhammad Qasim**, Maqsood Ali, Jin-Hoi Kim. Submitted *Journal Theranostics* IF 8.5

## Conferences Papers

- 1 “Comparative study of MUF (Modified Ultra Filtration) and non MUF technique in children were undergoing Open Heart Surgery with reference to resource utilization” on 28 May 2008 in the 2nd National Conference of Health Biotechnology, held at the Pakistan Academy of Sciences **Islamabad, Pakistan. (Poster)**
- 2 “Study of Effect of radiotherapy on Blood Cells Counts in Cancer patient” on 18 Dec 2008 in the 9th Biennial PSBMB Conference, held at Pir Mehar Ali Shah Arid Agriculture University **Rawalpindi, Pakistan (Poster)**



- 3 “General perception about HIV/AIDS among graduate and undergraduate university student of twin cities Rawalpindi & Islamabad” on 6 to 8 Nov, 2009 in Annual Conference of, Pakistan Association of Pathology (PAP) held at Pakistan Institute of Medical Sciences **Islamabad Pakistan. (Oral)**
- 4 ‘Evaluation of Commercially Available Rapid Testing Kits Combination with Western Blot for Diagnosis of HIV/AIDS’ in HAEMCON 2010 organized by The Pakistan Society of Hematology at Children Hospital **Lahore, Pakistan. (Poster).**
- 5 “General Perception about Biosafety, Biosecurity and Bioterrorism among Medical Technologist of Public & Private hospitals working on STIs in Twin cities” on 18 Sep 2010 in 1st National Conference of Pakistan association of Medical Laboratory Sciences, held in **Faisalabad, Pakistan** and won a Best Presenter Award. **(Oral)**
- 6 “Survey on Perception about Biosafety, Biosecurity, Bioethics and Dual use of research among university graduate and gap analysis of Pakistani universities’ in Biosafety and Biosecurity International conference BBIC 2011 held in **AMMAN, Jordan** from 12-16 Sep, 2011. **(Poster)**
- 7 “Synthesis of thermo sensitive pNIPAM based nanogels for delivery of peptide and proteins” in the 2013 fall conference of “The polymer Society of Korea” held at the convention center, science city of **South Korea, Daejeon** from 11th April 2013 to 12th April 2013. **(Poster)**
- 8 “pNIPAM nanobased nanogels for antifungal drug delivery” in conference, the world congress on Biomimetic, Artificial Muscles and Nano-Bio (BAMN2013) held at the Grand Hotel **Jeju Island, South Korea** from Aug 26 to Aug 31st 2013. **(Poster)**
- 9 “Enhanced topical delivery of Amphotericin B by using pNIPAM nanogels’ in 2013 meeting of the Korea Society for Biomaterials held in Science and Technology Centre **Seoul, South Korea** from 26 Sep 2013 to 27 Sep 2013. **(Poster)**

#### **Invited International Lectures:**

- 1 Delivered lecture on “*Bio threats in Asia Pacific*” during the meeting of Council for Security Cooperation in the Asia Pacific, CSIS Asia Pacific forum **Kuala Lumpur, Malaysia** on April 2015. [http://csis.org/files/attachments/150406\\_QasimPresentation.pdf](http://csis.org/files/attachments/150406_QasimPresentation.pdf)
- 2 Delivered series of Lecture on *3D printed and Nanofibrous scaffold for Bioengineering*, at 41st International Nathiagali Summer College, Pakistan Atomic Energy Commission at National Centre for Physics, **Islamabad, Pakistan**. 25th 30<sup>th</sup> July, 2016. <http://www.nep.edu.pk/insc/insc-new.php>
- 3 ‘*Integrated Nanotechnologies for SGDs*’ MISK Global Forum, **Riyadh, Saudi Arabia**, 15-16 Nov, 2017
- 4 Invited lecture on ‘*polymeric nanoparticles for tissue engineering*’ at 1<sup>st</sup> National Conference on nanomedicine at Department of Pharmacy, Quaid I Azam University, **Islamabad Pakistan**, 30 November 2017.
- 5 Lahore University, **Lahore**, presented talk on “*Nanomedicine for Biomedical Solutions*” 5 December 2017
- 6 Invited talk on *Nanomedicine for treatment of infectious diseases* at Academy of Sciences Malaysia and US National Academy of Sciences. Conference to Promote Safe and Secure Science in the MESA regions -**KL, Malaysia** 5-9 Feb 2018.
- 7 PyeongChang Global Peace Forum (PGPF 2019). *Session Youth and Peace – UN Security Council Resolution (SCR) 2250*. Feb 10, 2019 **Pyeongchang South Korea**
- 8 Talk on *The Role of Youth in in Global Nuclear Dialogue at Towards Global Peace, Strengthening Youth’s Involvement in the Global Nuclear Dialogue*, 31st May 2019 **Ban Ki-moon Centre for Global Citizens at Yeonsi University Seoul** by CTBTO and Korean Ministry of Foreign Affairs.
- 9 Talk on *Nanotechnology for sustainable developments Goals SGDs* at BIOSECURITY WORKSHOP “Engaging Young Scientists from the Global South in Biosecurity Diplomacy” 3-4 August 2019 by **UNODA** at **Geneva Switzerland**.

[https://www.unog.ch/80256EDD006B8954/\(httpAssets\)/6162B578E2A0768FC125845D003577EB/\\$file/QASIM+Research+Project.pdf](https://www.unog.ch/80256EDD006B8954/(httpAssets)/6162B578E2A0768FC125845D003577EB/$file/QASIM+Research+Project.pdf)

- 10 Talk on **importance of business model for successful startup**, Innov8HQ **Dunedin City Council, New Zealand**,
- 11 Talk on *nanobiomaterials for biomedical Application and 3D bioprinting* at Centre for Bioengineering and Nano medicine Showcase – Celebrating 10 Years of Bioengineering at University of Otago, **Dunedin New Zealand** 27 November 2019  
<https://www.facebook.com/events/2300467026719172/>

## Media Talks:

I talked about Nanomedicine and their prospective for Pakistani Medical Issues at state television “Pakistan Television (PTV) News. <https://www.youtube.com/watch?v=u9J3TYoxgc4>

## Experience

**[Oct2019-to Present] Centre of Bio Engineering and Nanomedicine, University of Otago, Dunedin, New Zealand Research Fellow**

- Fabrication of nanomatrix for Skin Tissue Engineering
- Development of novel hydrogel bioink for 3D bioprinting
- Strategic Planning of Nanobioengineering Departments
- Curriculum development
- Teaching of Two master level Courses (Biomaterials/ Tissue Engineering and Drug Delivery)
- Supervision of Master and PhD Students
- Proposal writing



**[Jan 2019-to Sep 2019] Dept. Of Nano Biotechnology , Gachon University, Seongnam Si, South Korea Research Professor**

- Fabrication nano materials for microfluidics devices applications
- Blood Brain Barrier on Chip,
- Inflammatory model on Chip
- Water/Blood Screening Micro Device
- Cartilage and bone tissue engineering by using hydrogel scaffold
- Co-Supervising graduate students.
- Teaching of master level Course (biochemistry, Immunology and Molecular Biology)



**[Jan 2018-to Jan 2019] Stem Cells and Regenerative Biotechnology, Konkuk University Seoul, South Korea Post Doc Researcher**

- Fabrication, synthesis and characterization of standard and innovative nano biomaterials scaffold for anticancer activity
- Molecular characterization of nano drug delivery and tissue engineering
- In Vitro 3D cell culture with human and mouse cell lines
- In Vivo drug screening and nano delivery
- Teaching of master level courses Applied Materials /Biochemistry



[Sep 2016-to Aug 2017] Microfluidics Lab , Mechanical Engineering, Konkuk, Seoul, South Korea

**Post Doc Researcher**

- Fabrication of Kidney Chip for drug screening
- Microfluidics devices for organ on chip
- Lithography
- Auto CAD designing
- Cell Culture and Immune Assays for drug screening
- Fabrication of nano fibrous scaffold



[July 2015-to July 2016] Ajou University School of Medicine, Immune Network Research Centre, Suwon South Korea **Research Professor**

- Test and characterization of standard and innovative biomaterials for drug delivery and Immune Modulation.
- Fabrication of nanoparticles & bio-composites for tissue engineering applications.
- Fabrication of kidney chip for drug screening and microfluidic devices
- Lithography
- Auto Cad Designing
- DNA and tumor isolation from blood by microfluidic devices
- Cell culture and immune assays for drug screening
- Fabrication of nano fibrous scaffold using 2D and 3D cell culture systems for evaluation of biomaterials
- Using in-vitro standardized bacterial assay to analyze implant infection.
- Train and supervise new graduate students and undergraduate students in experiments



[March 2012- Feb 2015] Advanced Biomaterials and Stem Cell Engineering Lab Chung Ang University, Seoul, Korea **PhD Research Scholar**

- Fabrication of nanogels and nanofibers for biomedical application
- Antimicrobial testing of biomaterials
- Cloning and protein expression analysis
- Stem cell culture & cytotoxicity analysis
- Conjugation of nanomaterials
- 3D scaffold for bone and cartilage tissue engineering
- DNA and drug delivery by using nano particles
- Teacher assistant & lecture preparation for stem cell tissue engineering & immunology
- Manuscript and project writing
- Lab safety/quality control
- Immune modulation by using functional nanoparticles
- Teacher Assistance



[Jun 2011 – Feb 2012] National TB Control Program (GF UNO), Islamabad Pakistan

**Molecular Biologist**

- Molecular Diagnostic of Mycobacterium Tuberculosis
- Solid and liquid culture of Mycobacterium Tuberculosis
- Microscopy and staining of clinical samples for Mycobacterium Tuberculosis
- Data surveillance of TB HIV patients in Pakistan
- Lab quality control & quality assurance
- Capacity building training of lab workers





- Labs accreditations
- Epidemiology studies
- Monitoring & evaluation
- Public Health Policy

**[Jan 2011 to Dec 2011]** Quaid-i-Azam University, Islamabad, Pakistan,

**Research Associate**

- Development of educational module for university graduates' student on dual use education
- Survey of Bioethics, Biosafety, Biosecurity and dual use education
- Organization conference and seminars for awareness of Biosafety, Biosecurity
- Policy development for safe and secure research
- Research & advocacy
- Science Policy



**[Aug 2010 to Dec 2011]** Developing Health International, Islamabad, Pakistan

**Research Coordinator**

- Project Management
- Molecular Diagnostics of TB & HIV patients
- Report writing
- Procurement of Items
- Organizing meeting and conferences
- Public Health Policy
- Research coordination with country wide research centers
- Consultancy on Public Health Issues
- Epidemiological study of infectious diseases and immunological disorders

**[Oct 2009- June 2010]** National AIDS Control Program (UNFPA), Islamabad, Pakistan

**Research Fellow**

- Project Management and Coordination
- Molecular Screening of HIV
- Cloning, sequencing and molecular characterization of STIs and TB in Pakistan
- Laboratory Quality Control
- Monitoring and Evaluation of research projects
- Capacity building and training of Lab Technologists
- Project and report writing
- Development of HIV STIs Testing Policy of Pakistan
- Quality Control/Quality Assurance
- Lab Accreditations
- Epidemiology



**[March 2007 to Aug 2009]** Nuclear Medicine, Oncology & Radiotherapy Institute (PAEC) Islamabad,

**Research Associate**

- Molecular Diagnostics and PCR analysis of HCV and HBV
- ELISA based screening of HCV and HBV
- Radiotherapy of cancer patients
- Research on gene mutation of breast cancer patients
- Lab Quality Controls



**International Engagements:**

### **1. Young Leader at CTBTO (IAEA) Young group (April 2016 to Present)**

An official youth body of Comprehensive Test Ban Treaty Organization (CTBTO) Through this CYG platform I am trying to engage youth from Asia Pacific region to increase the awareness and importance of nuclear non proliferation and disarmament. In this regard I have attended and presented my research in CTBTO science and Technology conference (2017) Austria Vienna, started CYG Facebook TV and recorded interview of senior experts on nuclear issues. I have attended as a panelist at Pyeongchang Global Peace Forum 2019 South Korea, on session youth role in World Peace. I have also attended CTBTO 2nd Science Diplomacy Symposium (SDS) and organized one day workshop "Towards global Peace Strengthening Youth Involvement in the global nuclear dialogue in association with Bankimoon Center of Global Citizen Seoul South Korea. I also contribute to policy blog on CYG news room projects



<https://www.ctbto.org/press-centre/highlights/2016/ctbto-youth-group-launched/members-of-the-ctbto-youth-group-so-far/>

### **2. Young Leader at Centre for International and Strategic Studies (CSIS) Asia Pacific Young Leader (June 2012-Present)**

Asia Pacific forum is a platform for young policy makers for their capacity building and training with following opportunities



- Policy Analysis
- Cross cultural interactions and collaboration with young leaders from around the globe.
- Develop policy making skills through firsthand experience
- Exchange views with seasoned professionals at track 2 conferences.
- Co-author original research and opinion piece with peers and experts

at this platform I am member of Council for Security Cooperation in the Asia Pacific study group on Nuclear Non Proliferation and Disarmament and Bio-security. I have participated in last 3 meetings of CSCAP in Malaysia (2015), Seoul South Korea (2018) and Bali Indonesia in (2019) and presented my talk on Bio-threats in Asia Pacific, and CTBTO a verification regime for nuclear nonproliferation and disarmament. I also contributed to Young Leader blogs on Asia Pacific Policy

### **3. President Broader Middle East and North Africa Association of Young Scientists (BAYS)**

Networking of Young Leader in BMENA region

- Organizing events and training workshops
- Research Reports and proposal writings
- Building collocation with international NGOs working for promotion of Science & technology
- Biosafety, Biosecurity and Dual Use Education awareness among Youth
- Science & Diplomacy



I have organized number of workshop for youth from MENA region to train them on concepts of Biosafety, Biosecurity, Dual use education and responsible conduct of sciences. We also running online platform for their capacity building and information sharing on many educational opportunities for youth from MENA region. I have attended MISA global Forum 2017, World Science Forum 2017, BBIC Jordan and AAAS Workshop in Tunisia and presented BAYS

### **4. Young Leader at The United Nations Major Group for Children and Youth (UNGMY)**

UNGMY is United Nations General Assembly-mandated, official, formal, and self-organized space for children and youth to contribute to and engage in the United Nations. I am member of its board for Annual Global Sustainable, Technology, & Innovation Conference (G-STIC). G-STIC is focused on integrated technological solutions for the Sustainable Development Goals (SDGs) and will draw on the globally best available knowledge and recent field experiences. G-STIC aims at supporting the technological discussions in the UN and other international policy fora as they relate to the SDGs, the climate goals and the means of Implementation of Multilateral Environmental Agreements. The goal of G-STIC is to help accelerate and strengthen the development, dissemination, and deployment of integrated technological solutions that are feasible, acceptable and affordable from both an economic and social point of view through increasing startups. G-STIC is, however, more than a conference series and aims at building knowledge bases and global expert networks in support of the technological transitions needed for the implementation of the Paris Agreement and the Agenda 2030 for Sustainable Development.



### Start up:

1. **CEO Scholarship Direct** ([www.scholarshipdirect.org](http://www.scholarshipdirect.org))
2. **CEO G NanoTech** (Commercialization of 3D bio printed scaffolds)
3. **Director KiaoraDunedin** ( Developing different software and Biomedical Apps based on Local Dunedin Data)
4. **Director Ayyan Molecular Products Pakistan**, (A Medical equipment and Reagents Productions and Supplies Company with worth of 5 million USD.

### Professionals Trainings and Workshops attended

1. 3 days training on ***“Bioethics Education in Pakistan: Necessity not Luxury”*** from 27 March to 29 March 2008 at COMSTECH Secretariat Islamabad, organized by OIC Ministerial Standing Committee on Scientific and Technological Cooperation (COMSTECH), Higher Education Commission (HEC) & Centre of Biomedical Ethics (CBEC).
2. 5 days’ workshop on ***“International Workshop on Molecular Techniques in Biological Research”*** at Pir Mehr Ali Shah Arid Agriculture University Rawalpindi (PMAS UAAR) from 06 May to 10 May 2008, organized by Higher Education Commission (HEC), Pir Meher University Rawalpindi (PMAS UAAR) and National Commission on Biotechnology (NCBI).
3. Two day training workshop on ***ISO 15189 the International Standard for Medical Lab***, held at 12–13 November 2009 at Karachi, organized by Pakistan National Council for Accreditation, Ministry of Science & Technology Pakistan.
4. ***8<sup>th</sup> National Training Course on Modern Techniques in Biotechnology***, organized by National Institute of Biotechnology and Genetic Engineering (NIBGE) Faisalabad, from April 12 to 16, 2010.
5. ***12 days training on Survey Research***, organized by World Health Organization **WHO** at Centre for Health and Population Studies (CHPS) Lahore, from April 18 to 30, 2010.
6. **Training of Biosafety and Biosecurity** at El Hassan Science City **Amman, Jordan** 12-16 September 2011. Organized by International Council for life Sciences (ICLS) & Royal Scientific Society Jordan.
7. **AAAS workshop on International Engagement: Responsible Biosciences for Safe & Secure Society** BMENA countries at Institute Pasteur Tunis, The Faculty des Sciences de Tunis, **Tunisia**. October 30 to November 3<sup>rd</sup>, 2011.
8. **“Biosafety, Biosecurity international workshop for Lab managers”** at COMSTECH Islamabad, Pakistan from 17 to 19<sup>th</sup> Oct 2011.
9. **‘Intensive Policy Course "Multilateral Verification, Collective Security: The Contribution of the CTBT" in Vienna, Austria** from 16-20 July 2012’ Organized by CTBTO UN.
10. ASEAN regional forum meeting, **Council for Security Cooperation in the Asia Pacific**, April 5-7, 2015 at Kula Lumpur, **Malaysia** by CSIS Asia Pacific Forum.
11. European Biosafety Association (EBSA) Training workshop **‘Challenges of new genetic techniques for biosafety’** on 21<sup>st</sup> April 2015 at ACV **Vienna Austria**.
12. European Biosafety Association (EBSA) Training workshop **‘Sustainable and Safe laboratories’** on 20th April 2015 at ACV **Vienna Austria**
13. Academy of Sciences Malaysia and US National Academy of Sciences. **Conference to Promote Safe and Secure Science** in the MESA regions -KL, **Malaysia** 5-9 Feb 2018.

### Conferences attended

- **10<sup>th</sup> annual conference of Pakistan Society of Hematology**, held at Pakistan Institute of Medical Sciences, Islamabad on March 14 to 16 March 2008 organized by the Pakistan Society of Hematology (PSH).

- **2<sup>nd</sup>.National Conference on Health Biotechnology**, held at the Pakistan Academy of Sciences in Islamabad, from 27 May to 28 May 2008 organized by National Commission on Biotechnology (NCBI), Higher Education Commission (HEC), Ministry of Science and Technology.
- **10<sup>th</sup> International Conference of Anesthesiology, Pain & Intensive care** at PC Bhurban and Islamabad, from 16 Oct to 19 Oct 2008, organized by the Armed Forces Institute of Cardiology (AFIC) and Pakistan Society of Intensive Care.
- **5<sup>th</sup> Annual PIMS symposium**, held at Pakistan Institute of Medical Sciences (PIMS) Islamabad, from 16 Oct to 18 Oct, 2008.
- 9th Biennial Conference on *“Advances in Biochemistry and Molecular Biology”*, held at the department of Biochemistry PMAS Arid Agriculture University Rawalpindi from Dec 17 to Dec 20, 2008. The Conference was organized by NCBI, Pakistan Society of Biochemistry & Molecular Biology (PSBMB) & Pakistan Academy of Sciences.
- **6<sup>th</sup> National Bhurban Conference on Applied Sciences & Technology (IBCAST)**, held from 19<sup>th</sup> January to 22<sup>nd</sup> Jan 2009 at the National Centre of Physics Quaid-e-Azam University, Islamabad, organized by the Centre of Excellence in Science & Applied Technologies (CESAT), NESCOM Pakistan.
- *“International Conference on Medical Education (ICME)”* 2009, held from 26 Jan, to 27 Jan 2009 at Convention Centre Islamabad. The Conference was organized by Riphah International University Islamabad, Pakistan Medical & Dental Council (PMDC) & Higher Education Commission (HEC) Pakistan.
- **“Pakistan Association of Pathology (PAP) conference”** held at PIMS from 6 to 8 Nov, 2009 Islamabad, organized by Pakistan Association of Pathology (PAP).
- **“Pakistan Society of Hematology (PSH) Conference HAEMCON 2010”** health at Children Hospital, Lahore, from 9th to 16 Feb at Lahore.
- **“1st National Conference of Pakistan Association of Medical Laboratory Scientist”** held in Serna Hotel Faisalabad on May 16, 2010.
- **“National conference and Consultative meeting on Injection safety”** by USAID and PAIMAN, held on May 28 2010 at Marriott Hotel Islamabad.
- **“International Conference of Biosafety & Biosecurity (BBIC 2011)”** organized by the International Council for Life Sciences (ICLS) and Royal Scientific Society of Jordan from 12-16 September 2011 in Amman city Jordan.
- **2013 fall conference of “The polymer Society of Korea”** held at the convention center, science city of Korea Daejeon from 11<sup>th</sup> April 2013 to 12<sup>th</sup> April 2013.
- **“The world congress on Biomimetic, Artificial Muscles and Nano-Bio (BAMN2013)** held at the Grand Hotel Jeju Island, Seoul South Korea from Aug 26 to Aug 31<sup>st</sup> 2013.
- **“2013 meeting of the Korea Society for Biomaterials”** held in Science and technology Centre, Seoul, South Korea from 26 Sep, 2013 to 27 Sep 2013.
- **2014 UN Public Service Forum and Award Ceremony**, 23-26 June 2014 Seoul, South Korea
- **BioKorea 2015 at Coex Seoul, Korea from 8-10<sup>th</sup> April 2015**
- 18<sup>th</sup> Annual Conference of The European Biosafety Association (EBSA) Training workshop ‘Challenges of new genetic techniques for biosafety’ on 18<sup>th</sup> Annual Conference of The European Biosafety Association (EBSA) held in ACV, Vienna Austria. 21<sup>st</sup> April 2015
- **CTBTO Science and Technology Conference 2017**, Hofburg Place, Vienna, Austria from 26-30 June 2017.
- MISK Global Forum 2017, Kingdom tower, Riyadh, Saudi Arabia from November 15-16, 2017
- World Science Forum (WSF) 2017, Dead Sea Jordan, November 7-11 2017. <https://worldscienceforum.org/participants/qasim-muhammad-6487>
- Conference to Promote Safe and Secure Science in the MESA regions **Kuala Lumpur, Malaysia** 5-9 Feb 2018

- CTBTO 2<sup>nd</sup> Science Diplomacy Symposium, Vienna Austria, May 2018
- Biological Weapons Conventions (BWC) meeting of Science Experts (MX2) on 2<sup>nd</sup> August UN Home Geneva, Switzerland by UNODA.  
[https://www.unog.ch/80256EE600585943/\(httpPages\)/5CDFFF0BD8AAA6A0C12583FD0030E13A?OpenDocument](https://www.unog.ch/80256EE600585943/(httpPages)/5CDFFF0BD8AAA6A0C12583FD0030E13A?OpenDocument)
- World Science Forum 2019 Budapest Hungary  
<https://worldscienceforum.org/participants/qasim-muhammad-33741>

### Workshops conducted:

- *Symposium on HIV/AIDS* and Current, Prospective at PIMS Islamabad in PAP Conference on 7 Nov, 2009.
- Audience based *T.V show AWAM KI AWAZ* on HIV/AIDS awareness at PMAS UAAR on 19 Dec, 2009, telecasted on CNBC Pakistan on January 2, 2010.
- *Two-day training workshop* on HIV/AIDS Laboratory Diagnostics and Laboratory Safety at Pakistan Institute of Medical Technologies, Islamabad, from 12 to 13 March 2010.
- A *two-day training workshop on Laboratory Diagnostics and Quality Assurance* in HIV Testing at College of Medical Laboratory Technologist of Pakistan Institute of Medical Sciences (PIMS) Islamabad, from 09 to 10 April 2010.
- **One-week voluntary blood donation campaign** (14-21 June 2010) as focal person, all over the Pakistan for Blood Transfusion in NACP.
- **International workshop on Synthetic Biology and its Dual Use** at COMSTECH on 3<sup>rd</sup> to 5<sup>th</sup> Feb 2011.
- The consultative workshop on ‘**Educational Material on Biosafety, Biosecurity and Dual Use**’ at Dept. of Biotechnology & Bioinformatics QAU Islamabad 24<sup>th</sup> May 2011.
- **Workshop on Modern trends in Biomedical Research** at Department of Biotechnology, Quid-i-Azam University Islamabad Pakistan, 3<sup>rd</sup> Feb 2016.

### Teaching and Research Expertise

#### *Molecular Biology and Biochemistry*

- **DNA and RNA Purification** from a variety of tissues (including Fresh Froze, Formalin Fixed Paraffin Embedded, Viral, body Fluids-Serum, Saliva).
- **Molecular Cloning basics**, Polymerase Chain Reaction (PCR), Restriction Digestion, Ligations, Transformation.
- **Gene expression** studies using Quantitative PCR, RT-PCR using SYBR Green and TaqMan assays, Agarose Gel Electrophoresis, DNA Purification from Agarose Gel and PCR Products.
- **SDS-PAGE, Staining, Western Blot, FACS**
- **Biochemical Analysis** MTT Assay, Cell tracking, ROS activity, ATPs assay

#### *Cell Biology*

- **Human Stem Cell Culture** (Maintenance and propagation). Bacterial & Virus Cell culture
- **Immuno-fluorescent** Staining & Visualization under Fluorescent Microscope. Immunohistochemistry.
- **Cell Migration, Cells microenvironment, Healing**

#### *Physiology*

- **Power Lab** instrument handling, performing basic to advance level experiments using a range of accessories and data analysis.

#### *Biomaterials and Nanotechnology*

- **Fabrication** Nanogels and Nanofiber fabrications, Au, Ag metal nanoparticle synthesis
- **Morphology analysis** DLS size and zeta potential measurement. AFM (Sample Preparation and analysis), TEM (Sample Preparation and



analysis)

- **Drug Delivery** DNA and Peptide delivery. Nanogel surface modification, Targeted drug delivery

**Bioinformatics:**

- **Phylogenetic Analysis, Primer designing, Sequence analysis**

**Mechanical Engineering**

- **Organ on Chip** Blood Brain Barrie Model, Kidney on chip, Blood vessel Model, Water filtration microfluidics devices, Lab on chip

**Teaching**

- Curriculum Developments, Course/lesson Planning, Technology Use, Group Management, Adoptability, Teaching Psychology, Students Evaluations, Delivery of Knowledge

**Project Managements**

- Strategic Planning, Monitoring and Evaluation, Budgeting, Leadership, Resource management.

**Policy Development**

- Critical Analysis, Data collection and Analysis, drafting of policy, Science and technology policy, International science and technology legislation, Public Health policy, Youth policy.

## References:

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