

Fall 2010-Spring 2011 & Spring 2013	Assistant Professor (Adj.) Department of Sciences, BMCC, City University of New York, NY, USA
2004-2005	Postdoctoral Fellow , School of Medicine, Stanford University, Stanford, California, USA.
2002-2004	Postdoctoral Fellow , Department of Chemistry & Biochemistry, Hunter College, City University of New York, New York, USA.

Teaching:

Classroom: Graduate & Undergraduate: Elements of Biochemistry, Biochemistry, Molecular Biology, Biotechnology, Microbiology, General Biology & General Chemistry.

Mentoring:

Completed Several Undergraduate and Graduate Students Research Projects aiming on the Gene Regulation of Protein Synthesis.

Awards, Scholarships, Fellowships, and Grants

- Receive 2010 American Society for Biochemistry and Molecular Biology travel award for the “Research Associate Scientist” in Experimental Biology meeting, 2010, Anaheim, CA, USA, April 24-28.
- Receive 2009 American Society for Biochemistry and Molecular Biology travel award for the “Postdoctoral Research Scientist” in Experimental Biology meeting (EB-2009), New Orleans, USA.
- Receive 2008 American Society for Biochemistry and Molecular Biology award for the “Postdoctoral Research Scientist” in Experimental Biology meeting (EB-2008), San Diego, CA, USA.
- Receive 2006 American Society for Biochemistry and Molecular Biology award for the “Postdoctoral Research Scientist” in Experimental Biology meeting (EB-2006), San Francisco, CA, USA.
- 2004 Score, NIH postdoctoral travel Award. For the purpose of presenting at the Biophysical Society meeting.
- RCMI, NIH postdoctoral research fellowship (2002-2004). Awarded for pursuit of postdoctoral project at Hunter College CUNY.
- Recipient of Government of India Sponsored Fellowship (DBT) in Master program of Biotechnology (1995-96), Department of Biotechnology, AM University, India.
- Recipient of 1989 undergraduate award for excellence in Science poster presentation on National Science day, City School of AM University, Aligarh, U.P. India.

Professional Activities and Services

Member, American Society of Biochemistry & Molecular Biology

Member, American Biophysical Society

Member, New York Academy of Science

Member, FASEB

Member, American Chemical Society

Member, European Federation of Biotechnology

Member, National Education Association of Teachers for Higher Educations, USA.

Served as Judge (Finals Event), 2012 New York City Science and Engineering fair (**NYCSEF**) for Poster presentation, held at The American Museum of Natural History, New York City Tuesday, March 27.

Served as Judge (Preliminary Event), 2012 New York City Science and Engineering fair (**NYCSEF**) for Poster presentation, held at the City College of the City University of New York on Sunday, March 3.

Served as Judge, 2011 New York City Science and Engineering fair (**NYCSEF**) for Poster presentation, held in City College of the City University of New York on March 6.

Scientific Recognition

Newsletter Brief Summer 2011:

Selected for summer 2011 New Letter Brief by Gene Centre, Sponsored by National Institute of Health, for the academic achievements of the City University of New York, New York, USA.

<http://genecenter.hunter.cuny.edu>

Newsletter Issue 2010:

Selected for 2010 New Letter Brief by Gene Centre, Sponsored by National Institute of Health, for the achievements of the “Best Research” by young Scientist at City University of New York.

<http://genecenter.hunter.cuny.edu>

Recognition by Scientific Society:

New finding of my research work on VPg has been recognized by the *Faculty of 1000 Biology Scientist*. Their comments are published in Faculty of 1000 website (<http://www.f1000biology.com>).

Publications

Text Book

Mateen Khan (2011) “Tetracyclines and Macromolecule” LAP LAMBERT Academic Publishing GmbH & Co. KG, Germany (ISBN: 978-3-8443-9322-4).

Invited Chapter

Khan, MA (2013) in a Book “RNA- Nanotechnology” PAN Stanford Publishing Pvt. Ltd. Singapore. ISBN: 9789814411646 (Hardcover), 9789814411653 (eBook).

<http://www.panstanford.com>

Peer Reviewed International Journal Articles

1. Khan, M.A., Ma, J., Walden W. E., Merrick, W.C., Theil, E.C., and Goss D.J. (2014). Rapid Kinetics of Iron Responsive Element (IRE) RNA/Iron Regulatory Protein1 and IRE-RNA/eIF4F Complexes Respond Differently to Metal Ions. ***Nucleic Acid Research***, 42(10) 6567-6577.
2. Ma, J., Haldar, S., Khan, M.A., Sharma, S., Merrick, W.C., Theil, E.C., and Goss, D.J. (2012). Fe²⁺/IRE-RNA interactions have opposite effects on eIF4F and IRP protein/mRNA binding for metal-metabolite control of protein synthesis. ***Proceedings of the National Academy of Sciences (PNAS) USA*** 109(22) 8417-8422.
3. Khan, M.A. and Goss, D.J. (2012) Poly(A)-binding protein increases the binding affinity and kinetic rates of viral protein linked to genome (VPg) interaction with translation initiation factors eIFiso4F and eIFiso4F-4B complex. ***Biochemistry*** 51(7), 1388-95.

4. Ecevit, O., Khan, M.A. and Goss D.J. (2010) Kinetic analysis of B/HLH/Z transcription factors c-Myc/Max/Mad with cognate DNA. **Biochemistry** 49(12): 2627-35.
5. Yumak, H., Khan, M.A., and Goss D.J. (2010). Poly(A)-tail affects Equilibrium and Thermodynamic Behavior of Tobacco Etch Virus mRNA with Translation Initiation factors eIF4F, eIF4B and PABP. **Gene Regulatory Mechanisms-BBA** 1799(9), 653-658.
6. Khan, M.A., Walden, W.E., Goss D.J. and Theil, E.C. (2009) Direct Fe²⁺ Sensing by Iron Responsive Messenger RNA•Repressor Complexes Weakens Binding. **J. Biol. Chem.** 284(44), 30122-30128.
7. Khan, M.A., Yumak, H. and Goss D.J. (2009). Kinetic Mechanism for the Binding of eIF4F and tobacco etch virus Internal Ribosome Entry Site RNA: Effects of eIF4B and Poly A Binding Protein. **J. Biol. Chem.** 284(51), 35461-70.
8. Baldwin, A., Khan, M.A., Tumer, N.E., Goss, D.J. and Friedland, D.E. (2009) Characterization of pokeweed antiviral protein binding to mRNA cap analogs: competition with nucleotides and enhancement by translation initiation factor iso4G. **Gene Regulatory Mechanisms-BBA**, 1789, 109-116.
9. Khan, M.A., Miyoshi, H., Gallie D.R. and Goss D.J. (2008) Potyvirus genome-linked protein, VPg, directly affects wheat germ *in vitro* translation: Interactions with translation initiation factors eIF4F and eIFiso4F. **J. Biol. Chem.** 283(3), 1340-1349.
10. Khan, M.A., Yumak, H., Gallie, D.R. and Goss D.J. (2008). Effects of poly(A)-binding protein on the interactions of translation initiation factor eIF4F and eIF4F-4B with internal ribosome entry site (IRES) of tobacco etch virus RNA. **Gene Regulatory Mechanisms-BBA**, 1779, 622-627.
11. Khan, M.A., Miyoshi, H., Ray, S., Natsuaki, T., Suehiro, N., and Goss, D.J. (2006) Interaction of Genome-linked Protein (VPg) of Turnip Mosaic Virus (TuMV) with Translation Initiation Factors eIFiso4E and eIFiso4F. **J. Biol. Chem.** 281 (38), 28002-28010.
12. Ray, S., Yumak, H., Domashevskiy, A., Khan, M.A., Gallie, D.R. and Goss D.J. (2006). Tobacco etch virus mRNA preferentially binds eukaryotic initiation factor (eIF)4G rather than (eIF)iso4G. **J. Biol. Chem.** 281 (47), 35826-35834.
13. Khan, M.A. and Goss, D.J. (2005) Translation Initiation factor (eIF) 4B affects the Rates of binding of the mRNA m⁷G cap analogue to eIFiso4F and eIFiso4F.PABP. **Biochemistry** 44, 4510-4516.
14. Khan, M.A. and Goss, D.J. (2004) Phosphorylation States of Translational Initiation factors (eIFs) affect mRNA Cap-Binding. **Biochemistry** 43, 9092-9097.
15. Khan, M.A., Mustafa, J. and Musarrat, J. (2003) Mechanism of DNA strand breakage induced by photosensitized tetracycline-Cu (II) complex. **Mutation Research**, 525(1)109-119.
16. Khan, M.A. and Musarrat, J. (2003) Interactions of tetracyclines and its derivatives with DNA *in vitro* in presence of metal ions. **Int. J. Biol. Macromolecule**, 33 (1-3) 49-56.
17. Tayyab, S., Khan, N.J. Khan, M.A. and Kumar, Y. (2003) Behavior of various mammalian albumins towards bilirubin binding and photochemical properties of different bilirubin-albumin complexes. **Int. J. Biol. Macromolecule**, 31, 187-193.
18. Khan, M.A., Muzammil, S. and Musarrat, J. (2002) Differential binding of tetracyclines with serum albumin and induced structural alterations in drug bound protein. **Int. J. Biol. Macromolecule**, 30(5), 243.
19. Khan, M.A. and Musarrat, J. (2002) Tetracycline-Cu (II) photo-induced degradation of serum albumin. **Comp. Biochem. Physiol. C Toxicol Pharmacol.** 131 (4) 439-446.
20. Khan, M.A., Kumar, Y. and Tayyab, S. (2002) Bilirubin binding properties of pigeon serum albumin and its comparison with human serum albumin. **Int. J. Biol. Macromolecule**, 30: 171-178.
21. Jaiswal, R., Khan, M.A. and Musarrat, J. (2002) Photosensitized paraquat-induced structural alterations and free radical mediated fragmentation of serum albumin. **J. Photochem. Photobiol.** 67(3), 163-170.

22. Khan, M.A., Muzammil, S. and Musarrat, J. (1998) "Interaction of photosensitized tetracycline with serum albumin" *Biochem. Mol. Biol. Int.*, 46, 943-950.

Abstracts

1. Ma, J., **Khan, M.A.**, Merrick, W.C., Theil, E.C. and Goss, D.J. (2013). Mechanism of activator (eIF4F) and suppressor (IRP) binding to iron responsive element mRNA. *The FASEB Journal April 9, 27*: 551.8.
2. Ma, J., **Khan, M.A.**, Merrick, W.C., Halder, S., Theil, E.C. and Goss, D.J. (2012). Iron induced eukaryotic initiation factor/mRNA binding affinity change. *The FASEB Journal March 29, 26*: 947.1.
3. **Khan, M.A.**, Ma, J., Halder, S., Theil, E.C. and Goss D.J. (2011). Iron Response Element (IRE) Riboswitches from Different mRNAs Selectively Influence Repressor Protein (IRP1) Binding Kinetics and Metal Ion Responses. *Proceedings of the 24nd Annual International Symposium on the RNA Structure and Function: A New frontier in Biomedical Research*, Center for study of Gene Structure and Function, Hunter College, City University of New York and Weill Cornell Medical College Clinical & Translational Science Center, New York, Jan 21.
4. Ma, J., **Khan, M.A.**, Merrick, W.C., Halder, S., Theil, E.C. and Goss, D.J. (2011). The interaction between eIF4F and iron response protein with IRE-mRNA. *The FASEB Journal (Suppl.) 25*: 703.2.
5. Ma, J., **Khan, M.A.**, Merrick, W.C., Halder, S., Theil, E.C. and Goss D.J. (2011). Interaction between eukaryotic initiation factors and IRE/IRP system. *Proceedings of the 24nd Annual International Symposium on the RNA Structure and Function: A New frontier in Biomedical Research*, Center for study of Gene Structure & Function, Hunter College, City University of New York and Weill Cornell Medical College Clinical & Translational Science Center, New York, Jan 21.
6. Sharma, D.S., Banerjee, B., **Khan, M.A.** and Goss D.J. (2011). A comparative study of cap-independent translation mechanism in barley yellow dwarf virus and tobacco etch virus. *Proceedings of the 24nd Annual International Symposium on the RNA Structure and Function: A New frontier in Biomedical Research*, Center for study of Gene Structure and Function, Hunter College, City University of New York and Weill Cornell Medical College Clinical & Translational Science Center, New York, Jan 21.
7. **Khan, M.A.**, Ma, J., Halder, S., Theil, E.C. and Goss D.J. (2010). Probing the Iron Switch in mRNA: Interactions of Iron Response Protein with IRE-mRNA. *Proceedings of the 15th Conference on Translational Control*. Cold Spring Harbor Laboratory, New York.
8. **Khan, M.A.**, Walden, W.E., Theil, E.C. and Goss D.J. (2010) Kinetic analysis of Iron Responsive Element (IRE) mRNA with Iron Regulatory Protein (IRP1). *The FASEB Journal*, 499.7.
9. **Khan, M.A.** and Goss, D.J. (2010) Kinetic Analysis for the Interaction of Initiation Factors (eIFs) with Tobacco Etch Virus Internal Ribosome Entry Site RNA. *Proceedings of the 15th Annual Meeting of RNA Society*, Seattle, USA.
10. **Khan, M.A.**, Walden, W.E., Theil, E.C. and Goss D.J. (2009) Selective decrease in regulatory iron response protein 1 (IRP1) binding to mRNA iron response element (IRE). *The FASEB Journal*, 22(1), 998.1.
11. **Khan, M.A.**, Gallie D.R. and Goss D.J. (2008) Poly(A)-binding protein affects the kinetics of tobacco etch virus pseudoknot RNA binding to translation initiation factor eIF4F. *The FASEB Journal*, 22(1), 998.1.
12. Goss, D.J., **Khan, M.A.**, Miyoshi, H. and Gallie, D.R. (2008) The role of potyvirus genome linked protein, VPg, in cap-independent translation: interactions with initiation factors and IRES RNA. *Proceedings of the 13th Conference on Translational Control*. Cold Spring Harbor Laboratory, New York.

13. Goss, D.J. **Khan, M.A.** Domashevskiy, A. and Yumak, H. (2008) Biophysical insights into the mechanism of viral protein synthesis. *Proceedings of the 40th American chemical society-middle atlantic regional meeting*, New York.
14. **Khan, M.A.**, Miyoshi, H. and Goss D.J. (2007) Translation Initiation Factors eIF4F and eIFiso4F Interacts Differently with Potyvirus Genome-Linked Protein, VPg". *The FASEB Journal*, April 21(5), 641.5.
15. **Khan, M.A.**, Ray, S., Domashevskiy, Yumak, H., Gallie, D.R., Miyoshi, H. and Goss, D.J. (2006) New Insights into the Mechanism of Plant TEV Virus protein Synthesis. *Proceedings of the 11th Conference on Translational Control*, Pg 177. Cold Spring Harbor Laboratory, New York.
16. **Khan, M.A.**, Miyoshi, H., Ray, S., Natsuaki, T., Suehiro, N. and Goss D.J. (2006) Interaction of genome-linked protein (VPg) of turnip mosaic virus (TuMV) with translation initiation factors eIFiso4E and eIFiso4G. *The FASEB Journal*, 20(4), 100.6.
17. Ray, S., Domashevskiy, A., Yumak, H., **Khan, M.A.**, Gallie, D.R. and Goss D.J. (2006) Tobacco etch virus mRNA preferentially binds eukaryotic initiation factor (eIF)4G rather than (eIF)iso4G. *The FASEB Journal*, 20(4), 100.7.
18. **Khan, M.A.**, and Goss, D.J. (2005) Translation Initiation factor (eIF) 4B affects the Rates of binding of the mRNA m⁷G cap analogue to eIFiso4F and eIFiso4F·PABP: Stopped-Flow Kinetic Studies. *Biophysical Journal* (supplement).
19. **Khan, M.A.**, and Goss, D.J. (2004) Functional Effects of *in vitro* Phosphorylation of Translational Initiation Factors. *Proceedings of the 9th Conference on Translational Control*. Cold Spring Harbor Laboratory, New York.
20. **Khan, M.A.**, and Goss, D.J. (2004) Phosphorylation States of Translational Initiation factors (eIFs) affect mRNA Cap-Binding. *Biophysical Journal* (supplement), 86(1), 316a.
21. Khan, N.J. **Khan, M.A.**, Kumar, Y. and Tayyab, S. (2002) Binding of bilirubin to different mammalian albumins and its effect on photochemical reaction. *Proceedings of the 9th APCCB and ACBI*, New Delhi, India.
22. Zaidi, S, Singh, B.R., **Khan, M.A.** and Musarrat, J. (2002) In vitro assessment of the genotoxic potential of certain herbicides. *Proceedings of the 4th Indian Agricultural Scientists and Farmer's Congress*, Ch. Charan Singh University, Meerut, U.P., India.
23. **Khan, M.A.**, Kumar, Y. and Tayyab, S.(2001) Bilirubin binding properties of pigeon serum albumin and its comparison with human serum albumin. *Proceedings of the 89th Indian Science Congress*, Lucknow, U.P., India.
24. **Khan, M.A.** and Musarrat, J. (2001) Mechanism of DNA breakage induced by tetracycline-Cu(II) complex upon photosensitization: Role of cuprous ion and oxygen free radicals. *Proceedings of National symposium on stability and stabilization of biomolecules*, Biotechnology, A.M.U. Aligarh, India.
25. **Khan, M.A.** and Musarrat, J. (2000) Strand scission in DNA induced with tetracycline-Cu(II) complex upon photosensitization. *Proceedings of the 88th Indian Science Congress*, IARI, PUSA, New Delhi, India.
26. **Khan, M.A.**, Muzammil, S. and Musarrat, J. (1999) Interactions of tetracycline and its derivatives with calf thymus DNA. *Proceedings of the 68th Annual Meeting of the Society of Biological Chemist, I.I.Sc., Bangalore*, India.
27. **Khan, M.A.**, Muzammil, S. and Musarrat, J. (1998) Protein fluorescence quenching and free radical generation with photosensitized tetracycline. *Proceedings of the 6th annual Meeting of the Society of Biological Chemist, J.N.U., New Delhi*, India.
28. **Khan, M.A.** and Musarrat, J. (1997) Studies on the binding and photoinduced degradation of serum albumin with tetracycline. *Proceeding of the 66th Annual Meeting of the Society of Biological Chemist, Andhra University, Visakhapatnam*, India.

29. **Khan, M.A.** Khan, M.A., Khan, R.H. and Siddique, S. (1996) pH dependence of lectin-carbohydrate interactions” *Proceedings of National Symposium on Molecular and Cellular Biophysics and 23rd Annual Meeting of Indian Biophysical Society*, AIIMS and JNU, New Delhi, India.

Meeting/Conference/Symposium/Workshop Attended

1. 2011- 24nd Annual International Symposium, *RNA Structure and Function: A New Frontier in Biomedical Research*, Center for study of Gene Structure and Function, Hunter College, City University of New York and Weill Cornell Medical College Clinical & Translational Science Center, New York, Jan 21.
2. 2010- 15th Annual RNA Society Meeting, Seattle, Washington, U.S.A. June 22-26.
3. 2010- American Society for Biochemistry and Molecular Biology (*Experimental Biology*) annual meeting, Anaheim, California, U.S.A. April 24-28.
4. 2009- American Society for Biochemistry and Molecular Biology (*Experimental Biology*) annual meeting, New Orleans, Louisiana, U.S.A. April 18-22.
5. 2009- Workshop on grant writing and the “*Biophysical techniques used in the study of proteins-protein and protein-RNA interactions*”. Sponsored by the NIH, MCRI, Gene center, CUNY, USA, June 20-July 24.
6. 2009- 22nd Annual International Symposium, *Translational Cancer Research*, Center for study of Gene Structure and Function, Hunter College, City University of New York and Weill Cornell Medical College Clinical & Translational Science Center, New York, Jan 22.
7. 2008- American Society for Biochemistry and Molecular Biology (*Experimental Biology*) annual meeting, San Diego, California, U.S.A. April 5-9.
8. 2008- 13th Conference on Translational Control. Cold Spring Harbor Symposium, held at Cold Spring Harbor Laboratory, New York, Sept 3-7.
9. 2008- 40th American chemical society-middle atlantic regional meeting. ACS meeting, held at Queensborough community college, bayside, Queens, New York. May 17-20.
10. 2008- 21st Annual International Symposium: *Frontiers of Nanotechnology and Biotechnology: Integration and Invention*, Center for study of Gene Structure and Function Hunter College, City University of New York, Jan 18.
11. 2007- American Society for Biochemistry and Molecular Biology (*Experimental Biology*) annual meeting, Washington, DC, U.S.A. April 28-May 2.
12. 2006- 11th Conference on Translational Control. Cold Spring Harbor Symposium, held at Cold Spring Harbor Laboratory, New York, Sept 7-12.
13. 2006- American Society for Biochemistry and Molecular Biology (*Experimental Biology*) annual meeting, San Francisco, CA, U.S.A. April 1-5.
14. 2005- 49th Annual meeting of Biophysical Society, Long Beach, California, U.S.A. Feb 12-16.
15. 2004- 9th Conference on Translational Control. Cold Spring Harbor Symposium, Cold Spring Harbor Laboratory Meeting, New York, Sept 7-12.
16. 2004- 48th Annual meeting of Biophysical Society, Baltimore, U.S.A. Feb 14-18.
17. 2002- 9th APCCB and 28th Annual conference of ACBI, held at New Delhi, India, March 9-14.
18. 2002- 4th Indian Agricultural Scientists and Farmer’s Congress held at Ch. Charan Singh University, Meerut, U.P., India
19. 2001- 89th Indian Science Congress held at Lucknow, U.P., India
20. 2001- National symposium on stability and stabilization of biomolecules held at Interdisciplinary Biotechnology unit, A.M.U. Aligarh, India, March 13-14.
21. 2000- 88th Indian Science Congress held at IARI, PUSA, New Delhi, India.

22. 2000- "*National Science Day Programme*" sponsored by DBT, Ministry of Science & Technology, Government of India, organized by the Interdisciplinary Biotechnology Unit, AMU, Aligarh, India, Feb 28.
23. 1999- *68th Annual Meeting of the Society of Biological Chemist*, held at I.I.Sc., Bangalore, India.
24. 1999- Workshop on "*Bioinformatics in the 21st Century*" sponsored by DBT, Ministry of Science & Technology, Government of India, organized by the Distributed Information Sub-Centre, AMU, Aligarh, India, Oct 26-28.
25. 1999- *National Science Day Programme* sponsored by DBT, Ministry of Science & Technology, Government of India, organized by the Interdisciplinary Biotechnology Unit, AMU, Aligarh, India, Feb 28.
26. 1998- *67th annual Meeting of the Society of Biological Chemist*, India held at J.N.U., New Delhi, India.
27. 1998- *National Science Day Programme* sponsored by DBT, Ministry of Science & Technology, Government of India, organized by the Interdisciplinary Biotechnology Unit, AMU, Aligarh, India, Feb 28.
28. 1997- *66th Annual Meeting of the Society of Biological Chemist*, India, held at Andhra University, Visakhapatnam, India, Dec 22-24.
29. 1996- *National Symposium on Molecular and Cellular Biophysics and 23rd Annual Meeting of Indian Biophysical Society* held at AIIMS and JNU, New Delhi, India, Feb 18-21.
30. 1993- Short Term Technical Training on "*Some recent techniques used in the study of peptides, proteins and enzymes*". Sponsored by the Department of Biotechnology, Government of India at Interdisciplinary Biotechnology Unit, AMU, Aligarh, India.

Research Interest

Mechanism of Gene Regulation of Protein synthesis and Iron Metabolism:

Iron deficiency and overload are both major public health problems throughout the world. About 2.0 billion people in the world are suffered from iron related disorder. We are interested in understanding how regulation of gene expression via IRP/IRE interactions contributes to an organism ability to respond to dietary iron, alterations in iron metabolism due to host/pathogen interaction and to changes in iron metabolism which occur during development, differentiation and disease. We have first time shown (Khan, M.A. et al. *J. Biol. Chem.*, 2009), the mechanism of dissociation of iron regulatory protein (IRP)/iron responsive element (IRE-mRNA) complexes and showed Fe²⁺ destabilizes the complex, acting as riboswitches for the regulation of iron homeostasis. Maintaining the proper amount of iron is a challenge for everyone. Therefore, the studies on iron regulation will have useful outcome for the human population suffering from iron diseases. To gain insight into the dynamic process of iron regulation and mechanism of IRE/IRP binding, we have further examined the binding mechanism of eIF4F-IRE-mRNA (Jia et al. PNAS 2012) and kinetic of IRE-mRNA/IRP to measure the association and dissociation rate constant for two IRE-RNA and riboswitches of two IRE mRNA in the presence of metal ion (Khan et al., 2014, NAR). Our results leading to research on designer drug/chemicals that manipulate mRNA and make novel iron chelators that can remove the iron from ferritin safely and quickly for diseases such as for Sickle Cell Anemia, Thalassemia, and Hereditary Hemochromatosis.

I have also been involved in other research project, Tobacco Etch viral translational process (from plants to humans), I employed plant viruses as easy-to-use model systems to provide basic understanding of how viruses express genes and replicate. Because of similarities in translation and replication strategies across kingdoms, this knowledge may be relevant to major human viruses such as hepatitis A and C viruses, heart disease encephalomyocarditis (EMCV), polio, foot, and mouth diseases, common cold and dengue. In addition to cap-independent translation of TEV through IRES, TEV also contains a virus encoded protein, VPg, covalently attached to 5'-terminus. I have shown first time involvement of VPg in viral replication. This new finding has been recognized by the faculty of 1000 Biology Scientist. Recently I have shown the effects of PABP on the binding affinity and kinetics of eIFiso4F (Khan & Goss, Biochemistry, 2012). Using molecular biology and biophysical methods to study nucleic acid-protein, protein-protein interactions and macromolecular assembly of various protein synthesis translation initiation factors from human and wheat germ. We are particularly interested in mechanisms of assembly and how kinetics and equilibria influence the final composition of assembly complexes and ultimately biological function. Experiments are aimed at determining the detailed function of proteins and how they recognize nucleic acids. These processes are studied by steady-state and life-time fluorescence measurements, rapid scanning stopped-flow, circular dichroism and site-directed mutagenesis. Detailed quantitative measurements of these biological processes lead to elucidation of molecular mechanisms and how these processes can be regulated.