Professor Tayyab Husnain

Curriculum vitae

2012

TAYYAB HUSNAIN

Father's Name:	Muhammad Hussain Shah
Date of Birth	February 01, 1960
Designation:	Acting Director
Postal Address	Centre of Excellence in Molecular Biology, University of the Punjab, Canal Bank Road, Thokar Niaz Baig, Lahore-53700, Pakistan. Tel: (92-42) 35293137; Ext. 150 Fax: (92-42) 35423149 E-mail: director@cemb.edu.pk
Address:	House No. 178, Block H-III, Johar Town, Lahore. Tel: (92-42) 35303570 Fax: 042-35314211
Marital Status:	Married Cost : Syed (Gilani)

ACADEMIC RECORD

Visiting Professor	**2003-2004** (Six months) School of Biological Sciences, University of Southampton, UK Search for genes for abiotic stresses in plant
Post-doc	**1998** (Four months) International rice Research Institute, Philippine Tissue –specific expression of Bt gene in rice
Post-doc	**1993-94** (Four months) Department of Biochemistry, University of Washington, Seattle U.S.A Biolistic transformation of chickpea and rice
Ph.D.	**Molecular Biology** (Plant transformation) University of Nottingham, England **1986-1990** Supervisor: **Prof. E.C.Cocking** Co-supervisor: **Dr. M.R Davey**
M. Sc.	**Botany** (Plant Tissue Culture) University of Agriculture, Faisalabad, Pakistan **1981-1983** Supervisor: **Prof. Nasir Baig**
B. Sc.	**Physics, Chemistry, Biology** Government College, Faisalabad, Pakistan **1978-1980**

OTHER FORMAL TRAININGS	**2007. Holistic Foundations for Assessment and Regulation of Genetic Engineering and Genetically Modified Organisms,** July 30 August 10, University of Tromso, Norway. **2006. Assessor Training Course Laboratory Accreditation**, July 18-22, Norwegian Accreditation and Pakistan National Accreditation Council, Lahore, Pakistan. **2005. International Workshop on Microarray**, May 8-13, University of Arizona, Tucson, Arizona, USA. **2004 Obtaining and Managing External Research Funding,** February 10, Commonwealth Scholarship Commission in the United Kingdom. **2003 International Workshop in Bioinformatics**, April 22-25, 2003, CPC, Islamabad. **2000 Occupational Health & Safety**, August 03, HQ NUST, Rawalpindi. **2000 ISO 900 Version 2000**, August 02, HQ NUST, Rawalpindi. **1986 Orientation Course on Overseas Graduate Study**, including communication skills, computer awareness; information retrieval and mathematical operations, November 27-January 02, Pakistan.
RESEARCH EXPERIENCE	**Lecturer- Professor** **1984-2012** (Twenty Eight years) Centre of Excellence in Molecular Biology Abiotic stresses in plants, Tissue culture and transformation of three crop plants rice, cotton and chickpea. Development of insect resistant crops. **Foreign Research Experience at UK, Philippine and USA.** (Five year and 2 months) **Research Officer/Lecture** **1983-1986** Centre of Advanced Molecular Biology, University of the Punjab. Lahore Tissue Culture of *Cicer arietinum*
RSEARCH PROJECTS AWARDED	1. **Project Director:** Strengthening of Centre of Excellence in Molecular biology, a project awarded by Higher Education Commission worth 471.134 million for years 2005-2010. 2. **Project Director:** Development of Genomic Laboratory for studies of gene discovery and Plant pathogen interaction, a project awarded by Higher Education Commission worth 34.341million for years 2004-2005 3. **Principal Investigator:** Physical Mapping of Bt Gene in transgenic Basmati rice awarded by Higher Education Commission worth 1.268 Millions. 4. **Principal Investigator:** Transformation studies of rice (*Oryza sativa*) a project awarded by Pakistan Science Foundation worth 0.268 Million Years 1992-1995. 5. **Principal Investigator:** Development Of Transgenic Cotton Plants awarded by Ministry of Science and Technology at the approved cost of

1.680 million for Years 1995-1997.

6. **Principal Investigator:** Genetic transformation of cotton plants awarded by Ministry of Food Agriculture and Livestock worth 13.089 million for years 1995-1998.
7. **Principal Investigator:** Development of insect resistant cotton plants awarded by University Grants Commission worth. 0.990 millions for years 1997-2000.
8. **Co-Principal Investigator:** Biosafety studies of Transgenic Rice and Cotton awarded by Higher Education Commission worth 1.794 Millions
9. **Co Principle Investigator:** Effect of genetically modified Crops on Soil Microorganisms and Animals awarded by Higher education commission worth Rs. 3.503 Million.
10. **Project Manager:** Genetic Improvement of Cotton for Herbicide and bollworms Tolerance awarded by Punjab Agriculture Research Board worth 18.368 Million.
11. **Team Leader:** Development of gene constructs and genetically engineered germplasm resources/commercial genotypes resistant to cotton leaf curl disease and/or its insect vector awarded by Punjab Agriculture Research Board of worth 23.235 Million.
12. **Principal Investigator:** Cellular characterization of cotton universal stress protein Usp gene and its role in drought stress. Rs. 4.696 million.
13. **Principal Investigator:** The development of oligonucleotide microarray and its use in the analysis of abiotic stress. Rs. 6.445 Million for 36 months.
14. **Project Manager:** Development of transgenic cotton with multiple resistant to cotton leaf curl virus. Rs. 23.235 Million.
15. **Principal Investigator:** A Molecular approaches to prevent heredity blindness in Pakistan. Pak-US project for three years at the cost of US$.321,290.
16. **Principal Investigator:** Transformation of gene constructs and genetically engineered germplasm resources/ commercial genotypes resistant to develop cotton leaf curl disease and/ or its insect vector. Pak-US project for three years (2011-2014) at the cost of US$ 223,392.

ADMINISTRATIVE EXPERIENCE

- In charge MOE (2006-2009)
- Member Technical Advisory Committee (2006-2009)
- Chairman Fund Raising committee (2006, 2008, 2009).
- Director, Center of Excellence in Molecular Biology, (2010- till today)

  Group Incharge (1990-2002).
- Wing Incharge (1998-2002).
- Member, Biosafety Committee;
- Member of Board of Studies.
- Member, Board of Advance Studies (2001-2002).
- Chairman, Purchase Committee CEMB (1990-1992).
- Member, Departmental promotion committee.
- Member, Various other committees constituted by the Director.

	• Assistant Superintendent, Usman Hall No. 18, University of the Punjab, Lahore (1985-1986). • Visited counterpart laboratories working on cotton transformation in U.S.A and U.K. (1996). • Organized, Laboratory training courses on “Plant transformation” at CEMB, Lahore. (1996). • Organized, International training course on “Microarray Technology for gene discovery and expression, October 05-09, (2009). • Organized Second International Training workshop on DNA Microarray for gene expression and Training Workshop on Biosafety in Biomedical Research, March 07-11, (2011). • Organized Training Course on “Advances in Applications of Molecular Biology. December 07-11, (2011). • Organize Second one day workshop on “Young Researchers skill development & emerging ideas conferences. January 07, (2012).
NATIONAL COLLABORATIONS	• Pakistan Council of Scientific and industrial research (PCSIR), Lahore, Pakistan • National Institute of Biotechnology and Genetic Engineering (NIBGE), Faisalabad , Pakistan • Ayub Agriculture Research Institute (AARI), Faisalabad, Pakistan • Nuclear Institute for Agriculture and Biology (NIAB), Faisalabad, Pakistan • Central Cotton Research Institute (CCRI), Multan, Pakistan • Cotton Research Station (CRS), Multan, Pakistan • National Agriculture Research Centre (NARC), Islamabad, Pakistan • Kinnaird College for Women, Lahore, Pakistan. • Government College University, Lahore, Pakistan
	• University of Agriculture (UAF), Faisalabad, Pakistan • Bahaudin Zakariya University (BZU), Multan, Pakistan • Institute of Biotechnology and Biochemistry (IBB), University of the Punjab, Lahore. • Institute of Agricultural Sciences, University of the Punjab, Lahore.

INTERNATIONAL COLLABORATIONS

- Hans J. Bohnert, Department of. Plant Biology, University of ***Illinois***, Urbana. USA
- Thea Wilkins, Texas University, USA.
- David Galbraith, University of Arizona, USA
- Neil Forrester, Sydney , Australia
- Sean May, Nottingham, UK
- Rafi ul Islam, University of the Rajshahi, Bangladesh
- Swapan Datta, IRRI, Philippines
- Noor ul Allah Ahmadi , France
- Shantu Shantaram, New Jersey, USA
- Liz Dannis, CSIRO, Australia

INDUSTRIAL COLLABORATIONS

- Ali Akbar Group, Lahore
- Robert Cotton Association (RCA), Khanewal
- Guard's Rice Mills, Lahore
- Kissan Supplier Services (KSS), Lahore
- Jalandhar Seeds, Lahore
- Agri Farm Services, Multan
- Kanzo Seeds , Multan
- Auriga, Lahore
- Aziz Group, Multan

Member Chairman of Different Committees

1.	Member house requisition committee	2003, 2004
2.	Member Stock verification Committee	2004, 2005
3.	Chairman Purchase Committee	2005
4.	Chairman Fund Raising Committee	2006, 2008, 2009
5.	Member scientific Committee	2006
6.	Chairman Committee for preparation of bags, Banners and batches	2006, 2008, 2009
7.	Chairman Transport Committee	2006, 2008
8.	Chairman Stock verification Committee	2006
9.	Chairman Academic issues Committee	2008
10.	Chairman Hostel Management Committee	2008
11.	Member scientific Committee	2008
12.	Member Supervisory Committee	2009
13.	Member Advisory Committee	2009
14.	Chairman house requisition committee	2009
15.	Member Scientific Committee	2009

	Senior Researcher of the Research Projects • Transfer of Bt genes to chickpeas for pod-borer resistance sponsored by the Board Of Science and Technology for International Development (BOSTID) USA. • Development of genetic resistance to common pests of rice crop through expression of Bt toxin genes sponsored by Rockefeller Foundation (1990-2000). • Expression of insecticidal (Bt) genes in cotton plants, sponsored by European Communities (1991-1994).
HONORS AND AWARDS	**2009** **Outstanding scientist's award** in Biotechnology (First position). **2008** Presidential award **(Taghma-e-Imtiaz)** for Academic Distinction, August 14. **2005** Presidential award **(Izaz-i-Fazeelat)** for Academic Distinction, August 14. **2003** Award of Academic Staff Common wealth Fellowship in United Kingdom for year. **1997** Certificate of Accomplishment for leading a highly successful project in rice and cotton transformation presented by National Centre of Excellence in Molecular biology, University of the Punjab, Lahore. **1994** Award for excellence in research to improve agricultural productivity in Pakistan; presented by the Pakistan Agricultural Research Council and Board on Science and Technology for International Development, the U.S. National Academy of Science. **1986** Award of Science and Technology Scholarship in the field of Genetic Engineering and Biotechnology.
PRODUCTIVE SCIENTIST	Pakistan Council of science and Technology, Islamabad, 2006, 2007.
MEMBERSHIP	1. Member, International Society of Biosafety Research. 2. Member, Genetical Society, U.K. 3. Member, Pakistan Society of Biochemists. 4. Member, International Association for Plant Tissue Culture. 5. Member, Advisory Board CABB, Faisalabad. 6. Member, Board of Governor CASVAB, Quetta. 7. Member, Technical Advisory Committee, (TAC), Pakistan Environmental Protection Agency, Islamabad. 8. Adjunct Professor, King Edward Medical University, Lahore.
INVITED MEETINGS **INTERNATIONAL**	1. First International Symposium on Genetic Engineering, CEMB, University of the Punjab, October 21 - 28, 1984, New Campus, Lahore, Pakistan.

	2. 49th Easter School Meeting on Genetic Engineering of Crop Plants, 17 - 21 April, 1989, .Sutton Bonington, U.K. 3. National/International Tele-communication Symposium on Plant Biotechnology, August 16-19, 1990, NARC, Islamabad. 4. Third International Symposium/Workshop on the Application DNA Technology to Agriculture and Health, October 24-28, 1992 CEMB, Lahore. 5. Fourth International Symposium/workshop on Application of Molecular Biological Research in Agriculture, Health and Environment, April 08-11, 1995, CEMB, Lahore. 6. Fifth international symposium-workshop on the application of molecular biological research in agriculture, health and environment, October 14-15, 1997 CEMB, Lahore. 7. International Symposium-workshop on Genomics and computational analysis October 16-18, 1997, CEMB, Lahore. 8. General Meeting of the international progress on rice biotechnology September 15-19,1997, Malacca, Malaysia. 9. Fifth International Congress of Plant Molecular Biology, September 21-27, 1997, Singapore. 10. Fourth International Rice Genetics Symposium, October 22-27, 2000. IRRI, Los Banos, Laguna, Philippines. 11. International workshop Toward Building a global rice gene Machine November 11-12. 2002 at CSIRO Plant Industry Canberra . Australia. 12. Plant and Animal Genomics XII conference, San Diego, California USA; January 09-15, 2004. 13. 8th International Symposium on Biosafety of genetically Modified organisms September 26-30, 2004 Montpellier, France. 14. International Conference on Biotechnology for Salinity &Drought tolerance in Plants, 28-31 March, 2005 at NCB, Islamabad. 15. 5th International rice Genetics symposium 19-23 November 2005 at Edsa Shangri-La Hotel Manila Philippines. 16. USA-Pakistan Symposium on drought tolerant genes of *Gossypium arboretum*, University of California, Davis, USA; November 4-5, 2007. 17. International Conference on Latest Techniques for Conservation of Animal Genetic Resources in Pakistan, September 14-15, 2011 Institute of Biochemistry & Biotechnology University of Veterinary and Animal Sciences, Lahore.
NATIONAL	1. Second National Meeting on Plant Tissue Culture, Peshawar, University Summer College, Baragalli, Abottabad, (April, 1985). 2. COMSTECH-NIAB workshop on Agroclimatology, Pests and Disease and their Control" Nov. 21-26, 1992, Faisalabad, Pakistan. 3. Final Meeting of BOSTID sponsored projects on "Toward Solutions of Stressed Lands" May 7-9, 1994, Bhurban, Pakistan. 4. First workshop on the "Management of cotton leaf curl virus" March 11-12, 1996, Islamabad.

	5. Inaugural International Conferences on Genetics, November 26-28, 1996, Islamabad. 6. Second workshop on the "Management of cotton leaf curl virus" August 11-12, 1997, Multan. 7. First National Symposium on "Biotechnology for sustainable Development" November 24-25, 1997, Government College, Lahore. 8. Sixth National conference of plant Sciences October 20-22, 1998, Department of Botany, University of Peshawar, Peshawar. 9. Third International Biennial conference of Pakistan Society for Microbiology March 28-30, 2000, Lahore. 10. First National Annual Conference of Biology, March 28-30, 2002, Biology Block, Government College, Lahore. 11. Seventh Biennial Conference on “Trends in biochemistry and Molecular Biology, April 2-5, 2003. At IBB. PU. Lahore. 12. First National Conference on Agricultural Biotechnology, Green retreat Hotel, Nathiagali, August 16-18, 2004. 13. National Bio-Forum, Centre of Excellence in Molecular Biology, Lahore, 2006. 14. National Bio-Forum, Centre of Excellence in Molecular Biology,Lahore, March-2008. 15. Further trends in molecular biological research and its application in agricultural and health, Centre of Excellence in Molecular Biology, March 25-27, 2009. 16. International symposium on Biotechnology applications in new emerging fields, Centre of Excellence in Molecular Biology, December 2010. 17. 2nd International training course on, Microarray for gene expression” Centre of Excellence in Molecular Biology, March 2011. 18. Advances in application in Molecular Biology, Centre of Excellence in Molecular Biology, December 19-23, 2011.
APPROVED SUPERVISOR	Approved supervisor eligible supervise PhD students nominated by Higher Education Commission
INVITED LECTURES	1. Fourth Regional Training Course on Expression of Bacterial Genes in Plants October 10-24, 1992 at CEMB, Lahore. 2. National Biotechnology Workshop January 1-10 at Department of Biochemistry, University of Dhaka, Bangladesh. 3. Laboratory training course on "Plant transformation" March 24-April 06, 1996, at CEMB, Lahore 4. Delivered a lecture in a course, "Latest development in Molecular and Biotechnology" organized by CAMB and UGC Lahore, October 01-07, 1998. 5. Delivered a lecture on Transgenic Rice at University of Southampton UK, December 22, 2003. 6. Delivered a lecture on Introduction to Microarray at HEC Lahore on 18-06-2004. 7. Delivered a lecture on “Conference on career opportunities in Molecular

	Biology & Biotechnology on June 09, 2011.
TEACHING COURSES	Cell Biology; Recombinant DNA Techniques; Instrumentation & Plant Molecular Biology; and Molecular Genetics
RESEARCH THESES SUPERVISED **M. Phil**	1. Tasneem Fatima (1994) Tissue culture and transformation studies of cotton *(Gossypium hirsutum* L). 2. Nargis Shahzadi (1994) Tissue culture and Agrobacterium mediated Transformation studies of *Brassica napus*. 3. Wasif Ahmad Ahsan Haris (1997) Transformation of cotton *(Gossypium hirsutum L*) with insecticidal cry1Ab gene by particle bombardment and Agrobacterium. 4. Samina Noor (1997) Transformation of rice (*Oryza sativa* L) with cry1Ab and cry1Ac. 5. Shazia Iram (1997) Partial sequencing of a Bt crystal protein gene from local isolate. 6. Farooq Mustafa (1997) Partial purification of cry1Ac and cry6b receptors from cotton bollworms. 7. Rizwana Anwer (1997) Entomological activity in rice transgenic plant against rice pests 8. Asifa Majeed (1999) Genetic transformation of *Gossypium hirsutum* L var. CIM-443 with insecticidal genes. 9. Asad jan (2000) Expression of cry1Ab gene in Indica Basmati rice 370 under different promoters. 10. Muhammad Nadeem Afzal Khan (2001) Transformation of Rice *Oryza sativa* with Cry 1 Ac, Cry 2A and GNA gene. 11. Sultana Rasheed (2002) Studies on somaclonal variations in Indica rice and RAPD analysis. 12. Nasir Mahmood (2002) transformation of plants with Cry 1Ac gene under wound inducible promoter. 13. Abdul Qayyum Rao (2002) Transformation of cotton var CIM 497 with Phytochrome B gene. 14. Khurram Bashir (2002) Field trials of transgenic Basmati Rice transformed with Cry 1Ac and Cry 2A genes. 15. Kashif Ahmad (2002) Segregation of transgene in cotton (*Gossypium hirsutum* L.). 16. Muhammad Saleem (2002) Transformation of Cotton (*Gossypium hirsutum*) Var. CIM 446 with Cry1Ac & Cry IIA genes. 17. Muhammad Naseem (2003) Over expression of DREB gene in indica rice. 18. Nosheen Ishaq (2003) Differential Display of mRNA under drought stress in Gossypium. herbaceum *arboreum* . 19. Farah Naz (2003) Inheritance studies of super basmati rice transformed with Xa 21 and Cry 1Ac genes. 20. Sadia Mushtaq (2003) Isolation and characterization of heat shock proteins in local vars. of cotton. 21. Tanveer Ali Choudary Identification of drought tolerant DNA transcript in Cotton *(Gossypium arboreum).*

	22. Imran Ali (2005) Expression of Wax gene in Desi cotton *(Gossypium arboreum)* under drought stress. 23. Uzma Saeed (2005) cDNA Sequence Homology between *Gossypium arboreum* and Arabidopsis thaliana. 24. Mahmood Ur Rehman Ansari (2005) In Situ hybridization of Bt genes in Indica Basmati Rice. 25. Noor Muhammad (2006) Inheritance and Biosafety studies of Bt transgenic Basmati Rice. 26. Saima Siddique (2006) Cloning of Fructose bisphosphate aldolase gene 27. Asma Maqbool (2007) Identification of drought tolerant transcripts in cotton. 28. Sobia Noureen (2008) Detection of Bt gene in transgenic cotton *(Gossypium hirsutum* L) . 29. Muhammad Waseem (2008) Cloning and Transformation of HsP26 gene in Cotton. 30. Zeeshan Shamim (2009) Over expression of transgene in T1 Progeny of cotton plant.
Ph.D	1. Farzana Khanum (1998) Transformation studies of rice (Oryza sativa L). 2. Tahira Fatima (2001) Studies on expression of foreign gene in rice (Oryza sativa L). 3. Naveeda Raiz (2002) Transformation of Basmati rice with Cry1Ac and Cry2A genes. 4. Rozina M. Ali (2004) Regeneration response of *Gossypium hirsutum* L. 5. Asifa Majeed (2005) Expression of Proteinase Inhibitor gene in cotton. 6. Bushra Rashid (2008) Transformation of Cotton with Bt gene to develop sustainable Resistance. 7. Ghazanfar Ali Khan (2008) Inheritance of Transgenes in Cotton. 8. Abdul Qayyum Rao (2009) Expression of Phytochrome B gene in Cotton. 9. Muhammad Irfan (2009) Search of drought tolerant genes. 10. Asma Maqbool (2009) Identification of drought tolerant genes through differential display. 11. Muhammad Younas Khan (2010) Identification of wax genes in *Gosypium arboretum.* 12. Uzma Saeed (2010) identification and characterization of drought tolerant genes in cotton by gene homology. 13. Muzna Zahur (2010) Isolation of transcription factor genes in plant 14. Mir Muhammad Ali Talpur (2010) Genetic Improvement of a local isolate of *Bacillus thuringiensis* 15. Allah Bakhsh (2010) Expression of two insecticidal genes in Cotton.

MEDICAL GENETICS

1. Saima Riazuddin (2001). Genetic basis of non-syndromic deafness.
2. Zubair Mohiuddin Ahmed (2002). Genetic and Molecular basis of Syndromic Deafness.
3. Sabika Firasat (2009). Genetic basis of Glaucoma in Pakistani Families.
4. Mahmood-ur-Rahman Ansari (2011). Interaction Studies of Myosin IIIa with Usher Proteins.

Ph.D THESIS EXAMINED

1. Tahsina Rahim (2001) Genetical and biochemical investigation and protoplast fusion of anthranilic acid mutant of Neurospora Crassa.
2. Tamina Akter (2006) Induction of leucine auxtrophs in *Neureospora Crassa* and their genetical and biochemical investigation

EXTERNAL EXAMINER

1. Department of Botany, University of Dhaka, Dhaka, Bangladesh,
2. Department of Biological Sciences, University of Quetta, Pakistan

DEVELOPMENT WORK

1. Established first protoplasts culture laboratory in Pakistan at Nuclear Institute for Agriculture and Biology, Faisalabad.
2. Established Plant transformation laboratories for chickpea, Brassica, rice and cotton at National Centre of Excellence in Molecular Biology Lahore, Pakistan.
3. Jointly assembled inexpensive “biolistic device” for the delivery of DNA into rice. The device has been locally fabricated at the cost of Rs.50,000 as against the 5-year lease price of US$ 50,000 by Dupont/Biorad U.S.A.
4. Develop six Bt cotton strains CEMB-01 and CEMB-02.

PATENTS

Application No. and Date	Title	Patent No.
778/2002	Methods for determination of protein and DNA contents for detection of *Bacilus thuringensis* in plant products.	138279
779/2002 7-9-2002	Development of Basmati Rice Containing Multiple Transgenes	138287
858/2007 18-07.2007	An improved Codon Optimized Human Interferon	140574
859/07 07-08-2007	A process for improving transgenic cotton plants	140649
12357257 21-1-2009	Heat-Tolerant Cotton Plant Containing Multiple Transgenes	800265
683/2009 24-07-2009	A process for modification of recombinant human interferon for therapeutic use	140586

	684/2009 24-07-2009	A method of purification of the recombinant protein products	140587
	12/876,999 03-04-2012	7-Nitro-2-(3—Nitro Phenyl)-4H-3,1-Benzoxazin-4-one or derivatives thereof for treating or preventing antiviral infections.	US8148368B2
	648/2008 5-6-2008	Development of cotton hybrid	In process
	20100186104 07/22/2010	Development of heat tolerant cotton containing multiple transgenes	In process
	765/2010 2010	Gene pyramiding and hybrid cotton Development of Pakistan cotton varieties application.	In process
	939/2011 26-12-2011	Development of Pakistani cotton containing virus resistant transgenes	In process

PAPERS IN PREPARATION

1. Saleem et al. Transformation of cotton with two *Bacillus thruingiensis* endotoxin cry1Ac and cry2A genes.
2. Rashid *et al.* RAPD Characterization of somaclonal variation is Indica Basmati rice.
3. Rao et al. Transformation of Phytochrome B gene in cotton.
4. Naz et al. Transformation of Indica Basmati rice with Xa21 gene.
5. Rahman et al. Developmental profile of Myosin IIIa in wild type mouse inner ear.
6. Rahman et al. Myosin IIIa is involved in development of hair cell stereocilia in mouse inner ear.
7. Khan A,Shahid AA,Rao AQ and Husnain T (2011) Role of Epicuticular waxes in the susceptibility of Gossypium aroboreum cotton to CLCuV in preparation.
8. Kiani S,Kamran SB,Rao AQ,Shahid AA and Husnain T(2011) Cloning and GUS Expression Studies of Bt Insecticidal Gene with Chloroplast Transit Peptide and Ricin Fusion-Protein Gene. In preparation.
9. Kamran SB, Kiani S ,Rao AQ,Shahid AA and Husnain T(2011)Improvement of fiber strength and fineness in cotton (NIAB-846) through transformation of GhEXP A8 Gene. In preparation.
10. Rao AQ, Ansari MR, Shahid AA and Husnain T(2011) Variation in expression of Arabidopsis thaliana Phytochrome B gene in cotton due to difference in Transgene copy no.

PAPERS SUBMITTED	1. Shahid, M.N, A. Jamal, B.Aftab, B, Rashid and T. Husnain. 2011. Isolation, identification and expression study of salt stress responsive transcripts from desi cotton (Gossypium arboreum L.) by differential display. Submitted in Mol Biol Rep. 2. Ahmad Ali Shahid, Sana Khalid, Allah Bakhsh, Tahir Rehman, Tayyab Husnain and S. Riazuddin (2012) "Risk Assessment studies of Transgenic Diet on Rats" submitted in Pakistan journal Zoology. 3. Rao A.Q, Bakhsh A, Samiullah T.R, Husnain.T and S. Riazuddin. Peeking through the world of Phytochrome submitted in Biotech.advances.
SUGGESTED REFEREES	○ **Professor E. C. Cocking, Director,** Centre for Crop Nitrogen Fixation, Plant Science Division, School of Biological Sciences, University of Nottingham, University Park, Nottingham, NG7 2RD United Kingdom. (Tel.: 44-115-9513239 Fax 44-115-9513240, E.mail:edward.cocking@nottingham.ac.uk.) ○ **Dr. Gail Taylor,** School of biological sciences, University of Southampton Basset Crescent East, SO16 7PX. U.K. (Tel +44 (0) 23 80592335, Fax. +44(0)23 80594269. E-mail: G.Taylor@soton.ac.uk) ○ **Dr Shahid Khan, Senior Scientist** Molecular Biology Consortium (Chicago, IL) Lawrence Berkeley National Laboratory, Berkeley , CA94720 ,USA Tel: 1-312-996-1216, Cell: 1-508-728-1028, Fax: 1-781-846-0255 E.mail: shahidk@lums.edu.pk
PROFESSIONAL AND ACADEMIC RECORD	
PAST ACHIEVEMENTS	***Protpolast Culture.*** I joined the Plant Genetic Manipulation Group, in 1986 and registered for my Ph.D. under the supervision of Professor E. C. Cocking and Dr. M. R. Davey, University of Nottingham, U.K. The research project involved the transformation of the forage legume species *Onobrychis viciifolia*. Plants tissue maintained in vitro and protoplasts were used for co-cultivation experiments with *Agrobacterium tumefaciens*. Relative transformation efficiencies were recorded in experiments aimed at inducing the *vir* genes of the Ti plasmid in *Agrobacterium tumefaciens*. In addition, binary vectors were developed in *A. tumefaciens* and *A. rhizogenes* and used to transform protoplasts of *Onobrychis viciifolia*. Genes coding for neomycin phosotransferase II and glucuronidase (GUS) activity were studied in plants regenerated from transformed tissues. In addition to *Agrobacterium*-mediated transformation, protoplasts of *O. viciifolia* and *M. sativa* were also used for direct gene uptake experiments. Gene transfer was achieved through the use of chemicals (PEG and Ca ions) and electrical (electroporation) methods. Suitable conditions of transformation were optimized using transient expression of chloramphenicol acetyl transferase (CAT) gene in cell suspension protoplasts of *O. viciifolia*. Marker genes e.g. hygromycin phosotransferase and neomycin phosotransferase II were studied in regenerated plants obtained from direct DNA uptake. ***Biolistic transformation*:** In 1993-94, I spent a sabbatical in Professor Milt Gordon's laboratory, Department of Biochemistry, University of Washington,

	Seattle, USA and worked on the transformation of Chickpea and Rice. The experience gained in the laboratories of Professor Cocking and Professor Milt Gordon provided an excellent basis to undertake research in Pakistan. ***Insect resistant transgenic plants*:** Conditions were established for expression of marker and reporter genes in chickpea and Brassica.. Scutellum-derived calli of Indica Basmati were bombarded with DNA coated tungsten particles to get transgenic plants containing *cry1Ac*, *cry1Ab.* cry2A and gna. Basmati rice was alos transformed with cry1A(b) under PEPC and pollen specific promoters. Similarly in cotton varieties MNH-93, CIM-443, transformation conditions using *Agrobacterium* as a facilitator have been established. The synthetic insecticidal genes *cry1Ab, cry1Ac* and *cry2 A were* transferred for high expression in virus-resistant and virus-susceptible varieties of cotton. Other genes *pinII, gna*, *phyto B* were transferred along with Bt genes to attain wider range of insect resistance and plant improvement. *Agrobacterium*–mediated transformation procedure was also developed to transform Basmati rice 370 Bt genes that expressed with high efficiency. As a consequence, Basmati rice 370 and cotton MNH-93 plants exhibited preferential resistance against rice leaf-folder and American bollworm in laboratory bioassay
PRESENT PROGRESS	Field trial of transgenic rice*:*_Transgenic rice has been tested for field performance. The transgenic Basmati lines showed up to 97-99% more resistance as compared to control when challenged to high infestation of yellow stem borer. This is the first ever report of successful field trial of Basmati rice in Pakistan. Biosafety studies of transgenic plants: The transgenic indica basmati rice and cotton are now being used in studies on biosafety and risk assessment. Horizontal and vertical gene flow is being studied from the transgenic Basmati rice. Ecological effects on the non-target insects both in the field and in the laboratory are being investigated. Allelopathy and fate of Bt protein in the environment is also being studied. Plant Genomics*:* I have pioneered another project to study the drought tolerant genes in *Gossypium arboreum* and *Agave sisal*ana Six new sequences of DNA transcripts has been obtained. Blast with cotton and Arabidopsis genes showed interesting results. Full-length gene(s) of these transcripts are being searched out. Successful isolation of epidermis and mesophyll tissues from *Agave sisaliana* was isolated Considering the difficulty of obtaining intact RNA from a plant that accumulates many secondary products, and the difficulty of obtaining separation of the tissues [epidermis and mesophyll], this is a major accomplishment. Eight new ESTs of drought tolerant genes from *Gossypium aroboreum* were isolated and submitted to NCBI. Nine DNA transcripts were also identified , one of them has homology with chlorophyll a-b binding protein. Linkage Analysis: Linkage analysis is an effective technique which is used to determine the genetic location of a disease causing gene in the absence of any other indication (*e.g.,* no cytogenetic abnormality, co-inherited disorders, good candidate genes or known protein product. LOD score Method: Recombinant in the pedigrees have to be analyzed to observe the presence or absence of linkage between two loci but for human pedigrees, it is not usually possible to count them. For this reason likelihood methods are used which calculate the likelihood of a given pedigree under different assumptions about the recombination fraction. In these calculations, recombination and non-recombination for

each possible genotype are calculated. A logarithm ratio is calculated denoted by Z. The calculated scores provided the strength of evidence in favour of linkage.

$$\text{LOD Score (Z)} = \text{Log10} \times \frac{\text{Probability of the data if disease and marker are linked}}{\text{Probability of the data if disease and marker are not linked}}$$

A LOD score of +3 or a positive score is an indication of linkage while a score of –2 or a negative score denotes absence of linage

FUTURE PLANS

Gene discovery: It is suggested to study effect of abiotic and biotic stresses on the expression of genes using such techniques as microarray and differential display. Our result will provide the number and nature of all genes that are implicated in stress tolerance and their response to alternation of stresses.

Selectable marker: The key genes that express in drought tolerance will be identified. These genes can be used to select the drought tolerant plants.

PUBLICATIONS

INTERNATIONAL

PLANT GENETICS

S.No.	Publications	Impact Factor	Cita-tion
1.	Rech, E. L., Gold, T. J., Husnain, T., Vainstein, M. H., Jones, B., Hammatt, N., Mulligan, B. J. and Davey, M. R. (1989). Expression of a chimeric kanamycin resistance gene d into the wild soybean (Glycine canescens) using a cointegrate Ri plasmid vector. ***Plant Cell Reports 8:*** 33-36.	2.279	10
2.	Golds, T.J., Lee, J. Y., Husnain, T., Ghose, T.K. and Davey, M.R. (1991). Agrobacterium rhizogenes mediated transformation of the forage legumes Medicago sativa and Onobrychis viciifolia. ***J. Expt. Bot. 42 (242):*** 1147 – 1157.	4.818	18
3.	Islam, R., T. Malik, T. Husnain and S. Riazuddin (1994). Strain and cultivar specificity in the Agrobacterium-chickpea interaction. ***Plant Cell Reports 13:*** 561-563.	2.279,	10
4.	Riazuddin, S. Husnain, T., Khan, E. and Khanum, F. (1995). Insect resistant transgenic Basmati rice. ***Rice Biotechnology Quarterly, 23:*** 7-8.	NA	--
5.	Husnain, T., Malik, T., Riazuddin, S. and Gordon. M.P. (1997). Studies on the expression of marker genes in chickpea. ***Plant Cell, Tissue and Organ Culture 49:*** 7-16.	1.243	11
6.	Husnain, T., Khanum, F., Fatima, T., Khan, E., Riazuddin, S. and Altosaar, I. (1998). Transforamtion of indica rice with synthetic Cry1A(c) Gene. ***Biologia 44(1&2):*** 180-192.	0.609	--
7.	Khanum, F., Husnain, T. and Riazuddin, S. (1998). Effect of age of seedling and phytohormones on micropropagation of indica rice (*Oryza sativa* L.) from meristem culture. ***J. Plant Biol. 41(2):*** 93-96.**)**.	0.964	--
8.	Maqbool, S., Husnain, T., Riazuddin, S., Masson, L. and Christou, P. (1998). Effective control of yellow stem borer and rice leaf-folder in transgenic rice indica varieties Basmati 370 and M7 using the novel delta-endotoxin cry2A Bacillus thuringiensis gene. ***Mol. Breed.***	2.193	31

	4(6): 501-507.		
9.	Chaudhry, B. Yasmeen, A., Husnain, T. and Riazuddin, S. (1999). Mini-scale genomic DNA extraction from cotton. P***lant Molecular Biology Reporter (17):*** 17:280-285.	0.825	1
10.	Majeed, A, Husnain, T. and Riazuddin, S. (2000). Transformation of Virus Resistant Genotype of Gossypium hirsutum L., with Pesticidal Gene. ***Plant Biotech 17(2):*** 105-110.	4.886	NA
11.	Husnain T., Asad, J., Maqbool, S.B., Datta, S.K, Riazuddin, S. (2002). Variability in expression of insecticidal Cry1Ab gene in Indica Basmati rice. ***Euphytica 128:*** 121-128.	1.597	12
12.	Bashir, K., Husnain, T., Fatima, T., Latif, Z., Riaz, N., Mehdi, S. A. and Riazuddin, S. (2004) Field evaluation and Risk Assessment of transgenic indica basmati Rice. ***Molecular Breeding 13:*** 301-312.	2.193	23
13.	Bashir, K., Husnain, T. and Raizuddin, S. (2004) Response of transgenic rice expressing two Bt genes to nontarget insects. ***IRRN 29(2):*** 15-16.	NA	--
14.	Rashid, B. Husnain, T. and Riazuddin, S. (2004) In vitro shoot tip culture of cotton *(Gossypium hirsutum* L). ***Pak. J. Botany 36 (4):*** 817-823.	0.947	--
15.	Bashir, K., Husnain. T., Fatima, T., Latif, Z., Riaz, N. and Riazuddin, S. (2005) Novel Indica Basmati Line (B-370) expressing two unrelated genes of Bacillus thuringiensis is highly resistant to two lepidopteran insects in the field. ***Crop Protection 24(10)***: 870-879.	1.517	5
16.	Rafiq, M., Fatima T., Husnain, T., Bashir, K. Khan, M.A, and Riazuddin, S. (2005). Regeneration and transformation of an elite inbred line of maize (zea mays l.), with a gene from Bacillus thuringiensis. ***South African J. Botany. 72:*** 260-266.	1.106	--
17.	Riaz N, Husnain, T., Fatima T, Makhdoom R., Bashir, K. Masson. L, Altosaar, I and S. Riazuddin (2006) Development of Indica Basmati rice harboring two insecticidal genes for sustainable resistance against Lepidopteran Insects. ***South African J. Botany. 72(1):*** 217-223.	1.106	--
18.	Abdul Qayyum Rao, S. Sarfraz Hussain, M. Saqib Shahzad, S. Yassir Abbas Bokhari,† M. Hashim Raza, Allah Rakha, A. Majeed, A. Ali Shahid, Zafar Saleem, Tayyab Husnain, and S. Riazuddin (2006) Somatic Embroyogenesis in wild relatives of cotton Gossypium Spp ***J. Zhejiang University Science B 7(4):*** 291–298.	1.020	05
19.	Rahman, M., Rashid, H., Shahid, A. A., Bashir, K., Husnain, T. and Riazuddin, S. (2007). Insect resistance and risk assessment studies of advanced generations of Basmati rice expressing two genes of Bacillus thuringiensis (2007). ***Electro. J. Biotech. 10(2)***: 240-251.	2.881	0
20.	Maqbool, A., Zahur, M., Irfan, M., Qaiser, U., Rashid, B., Husnain, T. and **Riazuddin, S.** (2007). Identification, characterization and expression of drought related alpha-crystalline heat shock protein gene (GHSP26) from desi cotton. ***Crop Sci., 47(6):*** 2437-2444.	1.735	2

21.	Maqbool, A., M. Zahur, Husnain, T. and Riazuddin, S. (2007). GUSP1 and GUSP2, Two Drought-Responsive Genes in Gossypium arboreum Have Homology to Universal Stress Proteins. ***Plant Mol Biol Rep.*** DOI10.1007/s11105-008-0049-0.	0.825	1
22.	Maqbool, A., Zahur, M., Irfan, M., Barozai, K, M. Y., Rashid, B., Husnain, T. and Riazuddin, S. (2008) Identification and Expression of Six Drought- Responsive Transcripts through Differential Display in Desi Cotton (Gossypium arboreum). ***Mol. Biol. 42(4):*** 559–565.	0.654	1
23.	Rahman M., Ali, I, Husnain, T., and Riazuddin, S. (2008) RNA interference: The Story of Gene Silencing in Plants and Humans. (Review). ***J. Biotechnology Advances26(3):*** 202-9.	7.600	--
24.	Zahur M, Maqbool A, Irfan M, Barozai MY, Qaiser U, Rashid B, Hussnain T. and Riazuddin, S. (2008) Functional analysis of cotton small heat shock protein promoter region in response to abiotic stresses in tobacco using Agrobacterium-mediated transient assay. ***Mol Biol Rep. 36(7):*** 1915-1921.	0.825	--
25.	Rashid, B., Saleem, Z., Husnain, T., Riazuddin, S. (2008). Transformation and Inheritance of Bt Genes in *Gossypium hirsutum*. ***J. Plant Bio. 51(4):*** 248-254.	0.964	--
26.	Khan Barozai MY, Irfan M, Yousaf R, Ali I, Qaisar U, Maqbool A, Zahoor M, Rashid B, Husnain T, and Raizuddin, S. (2008). Identification of micro-RNAs in cotton. ***Plant Physiol Biochem. 46(8-9):*** 739-51.	2.402	--
27.	Zahur, M., Maqbool, A., Irfan, M., Barozai, M.Y.K., Rashid, B., Husnain, T. and Riazuddin, S. (2008). Isolation and Functional Analysis of Cotton Universal Stress Protein Promoter in Response to Phytohormones and Abiotic Stresses. ***Mol. Biol. 43(4):*** 578-585.	0.654	--
28.	Shahid, A.A., Husnain, T., Riazuddin, S. (2008). Ascochyta blight of chickpea: Production of phytotoxins and disease management. ***Biotechnol. Adv. 26:*** 511-515.	7.600	--
29.	Maqbool, A., Zahur, M., Husnain, T and Riazuddin, S. (2009). GUSP1 and GUSP2, Two drought-responsive gene in *Gossypium arboretum* have homology to universal stress protein. ***J. Plant Mol Biol Rep. 27:***109-114.	2.279	--
30.	Rao A.Q, Bakhsh A, Kiani S, Shahzad K , Shahid A A, Husnain T and S. Riazuddin.(2009) The Myth of Plant Transformation. ***Biotechnology Advance 27:***753-763.	7.600	--
31.	Bakhsh, A., Rao, A.Q., Ahmed, A. A., Husnain, T. and Riazuddin S. (2009). Insect Resistance and Risk assessment studies in Advance lines of Bt Cotton harboring CrylAc and CryIIA genes. ***American-Eurasian J. Agric. & Environ. Sci., 6 (1):*** 01-11.	NA	--
32.	Hussain, S.S., Rao, A.Q., Husnain, T., Riazuddin, S. (2009). Cotton somatic embryo morphology affects its conversion to plant. ***Biologia. Plantarum. 53(2):*** 307-311.	1.582	--
33.	Rashid, B., Husnain,T. and Riazuddin, S. (2009). Rapid i*n vitro r*oot induction in transgenic cotton shoots. ***Plant Tissue Cult. & Biotech. 19(2):*** 247-251.	NA	--

34.	Rashid, B., Husnain, T., Riazuddin, S. (2009). Field Evaluation and Fibre Analysis of Transgenic Cotton. ***J. Crop Sci. Biotech. 12(3):*** 135-141.	NA	--
35.	Choi BY., Ahmed, Z., M., Bhinder MA., Shahzad M., Husnain, T., Riazuddin, S., Griffith AJ. and Friedman TB. (2009). Identities and frequencies of mutations of the otoferlin gene (OTOF) causing DFNB9 deafness in Pakistan. ***Clinical Genetics. 75(3):*** 237-243.	3.304	--
36.	Riazuddin S, Anwar S, Fischer M, Ahmed ZM, Khan SY, Janssen AG, Zafar AU, Scholl U, Husnain T, Belyantseva IA, Friedman PL, Riazuddin S, Friedman TB, Fahlke C. ,Molecular basis of DFNB73: mutation of BSND can cause nonsyndromic deafness or barter syndrome. American Journal of ***Human Genetics. (85)2:*** 273-280.	12.303	--
37.	Rao A.Q, Bakhsh A, S.Riazuddin and Husnain T (2010) Phytochrome B mRNA expression enhances Biomass yield and physiology of cotton plants ***African journal of Biotech. 10(10):***1818-1826.	0.573	--
38.	Bakhsh A, Rao A.Q, A. A, Ahmed, Husnain T and S. Riazuddin. (2010) 35S CaMV a developmental Promoter in being Temporal and spatial expression of Cry1Ac and Cry2A genes in Cotton. ***Australian Journal of Basic and Applied Sciences, 4(1):*** 37-44.	NA	--
39.	Rahman, M., Noreen, S., Husnain, T. Riazuddin, S. (2010). Fast and efficient method to determine the position of alien genes in transgenic plants.Emirates ***J. Food & Agri. 22(3):*** 223-231.	NA	--
40.	Qaisar, U., Irfan, M., Maqbool, A., Zahoor, M., Khan, M.Y.K., Rashid, B., Husnain, T., Riazuddin, S. (2010). Mystery of Fructose Bisphosphate Aldolase. Can. ***J. Plant Sci. 90(1):*** 49-60.	0.547	--
41.	Maqbool A, Abbas W, Rao AQ, Irfan M, Zahur M, Bakhsh A, Riazuddin S, Husnain T (2010) Gossypium arboreum GHSP26 enhances drought tolerance in Gossypium hirsutum. ***Biotechnol Prog.;26(1):*** 21-25.	2.178	--
42.	Qaisar, U., Irfan, M., Meqbool, A., Zahoor, M., Khan, M.Y., Rashid, B., Riazuddin, S., Husnain, T. (2010). Identification, sequencing and characterization of a stress induced homologue of fructose bisphosphate aldolase from cotton. Can. ***J. Plant Sci. 90(1):*** 41-48.	0.547	---
43.	Jahangir G.A., Nasir I.A., (2010). Various Hormonal Supplementations Activate Sugarcane Regeneration *In vitro*. ***J.Agri. Sci. 2(4):*** 231-237	1.418	--
44.	Nasir, IA., Jahangir, GA., Qamar, Z., Rehman, Z.U and Husnain, T. (2010) Maintaining the regeneration potential of sugarcane callus for longer span. ***African J. Agricultural Research Vol. 6(1):*** 113-119.	NA	--
45.	Tabassum, B., Nasir, IA., Farooq, AM., Rehman, Z., Latif, Z and Husnain, T. (2010). Viability assessment of *in vitro* produced synthetic seeds of cucumber. ***African J. Biotechnology. Vol 9(42):*** 7026-7032.	0.573	--
46.	Bushra, T., Nasir, I. A. and Husnain, T. (2010). Viability assessment of in-vitro produced synthetic seeds of cucumber. African J. Biotechnology. **Accepted**	0.573	--
47.	Muhammad, N., Rahman, M., Shahid, A. A., Husnain, T.	0.255	--

	Riazuddin, S. (2010). Risk assessment and biosafety studies of transgenic Bt rice (*Oryza sativa* L.). ***J. Agri. S&T*** **Accepted**		
48.	Majeed, A., Makhdoom, R., Husnain, T., and Riazuddin, S. (2010). Assessment of potato proteinase inhibitor-II gene as an antifungal and insecticidal agent. ***Accepted in Acta Agriculturae Scandinavica, Section B***	0.620	--
49.	Rao AQ, Irfan M, Saleem Z, Nasir IA, **Riazuddin S**, Husnain T. (2011). Overexpression of the phytochrome B gene from Arabidopsis thaliana increases plant growth and yield of cotton (Gossypium hirsutum). ***J Zhejiang Univ Sci B***. 12:326-334.	0.322	0
50.	Bushra, T., Nasir, I. A. and Husnain, T. (2011). Potato Virus Y mRNA Expression Knockdown Mediated by siRNAs. ***Cultured Mammalian Cell Line. Viroligica Sinica. 26 (2):***105-113.	0.553	--
51.	Nasir, I. A., Jamal, A., Husnain, T. and Riazuddin, S. (2012). Molecular Analyses of in-vitro selected gladiolus lines with increased resistance against Fusarium wilt. ***Pak. J. Bot. 42(4): __-__***.	0.947	--
52.	Bakhsh A, Rao A.Q, Shamim Z and Husnain T (2011). A minireview: Rubisco small subunit as a strong green tissue specific promoter Arch. Biol. Sci., Belgrade, 63 (2), 299-307.	0.356	--
53.	Bakhsh A, Shahzad k and Husnain T (2011). Variation in the Spatio-Temporal Expression of Insecticidal Genes in Cotton Czech ***J. Genet. Plant Breed., 47,(1):*** 1–9.	0.594	--
54.	Niaz M. Achakzai, Z. Rahman, M.S. Shahzad, S. Daud, M.S. Zar, M. Israr, Husnain T., Sascha Willuweit, Lutz Roewer (2011). Y-chromosomal STR analysis in the Pashtun population of Southern Afghanistan. ***Forensic Sci. Int. Genetics.*** Vol:6 pp:103-105.	2.870	--
55.	G.A. Khan., A. Bakhshs., S. Riazuddin and T. Husnain (2011). Introduction of cry1Ab gene into cotton (Gossypium hirsutum enhances resistance against Lepidopteran pest (Helicoverpa armigera). ***Spanish Journal of Agricultural Research.*** 9 (1), 296-302	0.566	--
56.	Majeed, A., Makhdoom, R., Husnain,T, and Riazuddin, S. (2011) Assessment of potato proteinase inhibitor-II gene as an antifungal and insecticidal agent. ***Acta Agriculturae Scandinavica, Section B - Plant Soil Science. 61:*** 92-96	0.62	--
57.	Majeed, A., Husnain, T.,Makhdoom, R., Shahid, A.A., Rashid, B. and Riazuddin, S. (2011). Differential Expression of potato proteinase inhibitor-II gene in cotton. ***Acta Agriculturae Scandinavica, Section B. 61:*** 92-96.	0.620	--

MEDICAL GENETICS

S.No	Publications	Impact Factor	Cita-tion
1.	Ahmed Z.M, Morell, R.J., Riazuddin, S., Gropman, A., Shaukat, S., Ahmad, A.A., Mohiddin, S.A., Fananapazir, L., Caruso, R.C., Husnain, T., Khan, S.N., Riazuddin, S., Griffith, A.J., Friedman, T.B., Wilcox, E.R. (2003). Mutations of MYO6 are associated with recessive deafness DFNB37; Am J Hum Genet 72(5): 1315-1322.	11.680	87
2.	Riazuddin, S.A., Zulfiqar, F., Zhang, Q., Yuri, V. Sergeev, Zaheeruddin, A,Q., Husnain, T., Caruso, R., Riazuddin, S., Sieving, P., and Hejtmancik, J.F. (2005). Autosomal recessive Retinitis pigmentosa is associated with mutations in RP1 in consanguineous Pakistani families. Invest. Opthalmol. Vis. Sci. 46 (7): 2264-2270.	3.431	8
3.	Riazuddin SA, Zulfiqar F, Zhang Q, Yao W, Li S, Jiao X, Shahzadi A, Amer M, Iqbal M, Husnain T, Sieving PA, **Riazuddin S**, and Hejtmancik JF. (2006). Mutations in the gene encoding the alpha-subunit of rod phosphodiesterase in consanguineous Pakistani families. ***Mol Vis***. ***12***:1283-91.	2.540	2
4.	Khan, S.Y., Riazuddin, S., Tariq, M., Anwar, S., Shabbir, M.I., Riazuddin, S.A., Khan, S.N., Husnain, T., Ahmed, Z.M., Friedman, T.B. and **Riazuddin, S.** (2007). Autosomal recessive nonsyndromic deafness locus *DFNB63* at chromosome 11q13.2–q13.3. ***Hum. Genet. 120(6)*****:** 789-793.	4.523	8
5.	Khan, S.Y., Ahmed, Z.M., Shabbir, M.I., Kitajiri, S., Kalsoom, S., Tasneem, S., Riazuddin, S., Khan, S.N., Friedman, T.B., Tariq, M., Riazuddin, A., Husnain, T., **Riazuddin, S.** (2007). Mutations in RDX encoding radixin cause nonsyndromic hearing loss in humans. ***Hum. Mutat. 28(5)*****:** 417-423.	5.959	29
6.	Kitajiri, S.I., McNamara, R., Makishima, T., Husnain, T., Zafar, A.U., Kittles, R.A., Ahmed, Z.M., Friedman, T.B., **Riazuddin, S.** and Griffith A.J. (2007). Identities, frequencies and origins of TMC1 mutations causing DFNB7/B11 deafness in Pakistan. ***Clin. Genet. 72:*** 546-550.	3.304	10
7.	Nal, N. Ahmed, Z.M., Erkal, E., Alper, O.M., Lu¨leci, G., Dinc, O., Waryah, A.M., Ain, Q., Tasneem, S., Husnain, T., Chattaraj, P., Riazuddin, S., Boger, E., Ghosh, M., Kabra, M., **Riazuddin, S**., Morell, R.J. and Friedman, T.B. (2007). Mutational spectrum of MYO15A: The large N-terminal extension of Myosin XVA is required for hearing. ***Hum. Mutat., 28(10)*****:** 1014-19.	6.887	11
8.	Ain, Q., Nazli, S., Riazuddin, S., Jaleel, A.U., Riazuddin, S.A., Zafar, A.U., Khan, S.HN., Husnain T., Griffith, A.J., Ahmad. Z.M., Friedman. T.B. and **Riazuddin, S.** (2007). The autosomal recessive nonsyndromic deafness locus DFNB72 is located on chromosome 19p13.3. ***Hum. Genet., 122(5)*****:** 445-450.	4.523	2
9.	Butt, T., Yao. W., Kaul. H., Xiaodong. J., Gradstein. L., Zhang. Y., Husnain, T., **Riazuddin, S.,** Hejtmancik . F. J	2.540	6

	and Riazuddin. S.A. (2007) Localization of autosomal recessive congenital cataracts in consanguineous Pakistani families to a new locus on chromosome 1p. ***Mol. Vis., 13:***1635-1640.		
10.	Riazuddin, S., Anwar, S., Fischer, M., Ahmed, Z.M., Khan, S.Y., Janssen, A.G., Zafar, A.U., Scholl, U., Husnain, T., Belyantseva, I.A., Friedman, P.L., **Riazuddin S.**, Friedman, T.B., and Fahlke, C. (2009). Molecular basis of DFNB73: mutations of BSND can cause nonsyndromic deafness or Bartter syndrome. ***Am. J. Hum. Genet.*, *85(2)***:273-80.	12.303	7
11.	Choi, B.Y., Ahmed, Z.M., Riazuddin, S., Bhinder, M.A., Shahzad, M., Husnain, T., **Riazuddin S.**, Griffith, A.J. and Friedman, T.B. (2009). Identities and frequencies of mutations of the otoferlin gene (OTOF) causing DFNB9 deafness in Pakistan. ***Clin. Genet.***, ***75(3)***:237-43	3.304	5
12.	Kaul, H., Riazuddin ,A., Yasmeen, A., Mohsin, S., Khan, M., Ahmad, I.., Khan, S. N., Husnain, T., Akram, J., Hejtmancik, J. F., Riazuddin, S. (2010). A new locus for autosomal recessive congenital cataract identified in a Pakistani family. Molecular Vision. 16: 240-245	2.54	4
13.	Ahmed ZM, Yousaf R, Lee BC, Khan SN, Lee S, Lee K, Husnain T, Rehman AU, Bonneux, S, Ansar M, Ahmad W, Leal SM, Gladyshev VN, Belyantseva IA, Van Camp G, **Riazuddin S**, and Friedman TB, Riazuddin S. (2011) Functional null mutations of *MSRB3* encoding methionine sulfoxide reductase are associated with human deafness DFNB74. ***Am J Hum Genet*. 88:** 19-29.	12.303	0
14.	Ali RA, Rehman AU, Khan SN, Husnain T, **Riazuddin S**, Friedman TB, Ahmed ZM, Riazuddin S. *DFNB86*, A novel autosomal recessive nonsyndromic deafness locus on chromosome 16p13.3. ***Clin Genet*** (2011). *In press*. Doi:101111.1399-0004.2011.01729.x	2.942	0
15.	Ali S, Riazuddin SA, Shahzadi A, Nasir IA, Khan SN, Husnain T, Akram J, Sieving PA, Hejtmancik JF, **Riazuddin S**. Mutations in the β-subunit of rod phosphodiesterase identified in consanguineous Pakistani families with autosomal recessive retinitis pigmentosa. ***Mol Vision*** (2011). 17:1373-1380.	2.540	0
16.	Naz S, Ali S, Riazuddin SA, Farooq T, Butt NH, Zafar AU, Khan SN, Husnain T, Macdonald IM, Sieving PA, Hejtmancik JF, Riazuddin S. Mutations in RLBP1 associated with fundus albipunctatus in consanguineous Pakistani families. *Br J Ophthalmol* (2011). 95:1019-1024.	2.934	--
17.	Naeem, M.A., Cbavali, V.R.M., Ali, S., Iqbal, M., Riazuddin, S., Khan, S.N., Husnain, T., Sieving, P.A., Ayyagari, R., Riazuddin, S., Hejmancik and J.F. (2012). *GNAT1* associated with autosomal recessive congenital stationary night blindness. Investigative Optomology &Visual Science. 53	3.43	--
	Total Impact Factor	**185.205**	**309**

NOVEL SEQUENCES	1. Maqbool, A., Zahur, M., Husnain, T. and Riazuddin, S., (2008) *Gossypium arboreum* universal stress protein1 (USP1) gene, complete cds. (bankit1004749 EUl07766) 2. Maqbool, A., Zahur, M., Husnain, T. and Riazuddin, S., (2008) *Gossypium arboreum* universal stress protein 2 (USP2) gene, complete cds. (bankit 1005499 EU107767) 3. Qaisar, U., Husnain, T., and Riazuddin, S. (2008) *Gossypium arboreum* plastid fructose 1,6 bisphosphate aldolase (Aldp) gene, complete cds; nuclear gene for plastid product. (bankit1008406 EU107768). 4. Kiani,S, Rao A.Q, Bajwa K.S and Husnain,T (2011) Petunia x hybrid cultivar Grandiflora chloroplast EPSPS precursor (EPSPS) gene, partial cds; nuclear gene for chloroplast product.Accession NO. JF499829 Version JF499829.1 GI: 331712209.
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