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Ahmed Jawaad Afzal

Education

August 2001- Southern Illinois University Carbondale, USA

Ph.D Molecular Biology, Microbiology and Biochemistry (MBMB)

- Project: Cloning, Isolation and purification of RHG1 and RHG4. Analysis of regions involved in elicitor recognition and dimerization
- **Course work completed, passed qualifying exams**

1996-1999 National Institute for Biotech. & Genetic Eng, Faisalabad, Pakistan

M. Phil Biotechnology

- Overall GPA 4.0/5.0, Grade A
- **Thesis:** Isolation, purification and characterization of Xylanase from *Scopulariopsis sp.* isolated from an alkaline pond.

1994-1996 Quaid-I-Azam University Islamabad, Pakistan

Masters in Molecular Biology/Biochemistry

- **Seminar:** Inverse transition temperature in proteins.

1991-1993 Islamabad College For Boys Islamabad, Pakistan

Bachelor of Science

- Subjects: Zoology, Botany and Chemistry.

1989-1991 Islamabad College For Boys Islamabad, Pakistan

Faculty of Science

- Intermediate (Pre-Medical).
- Subjects: Biology, Physics and Chemistry.

1987-1989 Islamabad College For Boys Islamabad, Pakistan

Matriculation

- Subject: Science.

Standardized Tests

May, 1996

TOEFL (Test of English as a foreign language). Registration No: 2816228. Score: 637, TWE (Test of written English) Score: 5.5/ 6.0.

August 1996

GRE (Graduate record examination). Paper pencil based. Analytical 550, Quantitative 560

Professional Experience

Jan 2005- Teaching Assistant

- TA for course “Introduction to agricultural biotechnology”
Course: PSGA 433 SIUC Carbondale, USA

August 2001- Research Tech I / Research Assistant

- Involved in various lab projects including ordering, sequencing Soybean PIs, *Fusarium* and Soybean BAC ends

August 2000-August 2001 Avlon Industries Chicago, USA Researcher

- Use of enzymes (Sulphur oxidases, isomerases and reductases) for hair straightening and waving.

Dec 1999-July 2000 Islamabad College of Arts and Sciences Islamabad, Pakistan Teacher

- Teaching A-levels and O levels Biology and supervision of practical work.

Sept 1996 to April 1999 National Institute for Biotech. & Genetic Engineering Faisalabad, Pakistan JRA (Junior Research Associate)

- Involved in research related to protein purification and characterisation of cell wall hydrolysing enzymes.

Sept 1995 – March 1996 Islamabad College For Boys Islamabad, Pakistan Teacher/ Lab Demonstrator

- Conducted various experiments with B.S students related to Genetics and Biochemistry at Islamabad College for Boys, Islamabad.

December 2000. Research assistantship for Ph.D from Southern Illinois University at Carbondale.

October 2000. HRB grant from University college Dublin, Ireland for a PhD in Molecular Medicine.

Awards

Publications

Shultz, J., Yasudas, C., Nagajyothi, L., Kazi, S., Bashir, R., Iqbal, M. J., **Afzal, AJ.**, Shopinski, K., Jayaraman, D., Wu, C., Town, C., Zhang, H and Lightfoot, D.A (2006). Representation of the physical map of the genome of *Glycine max*. *Nucleic Acids research* , 34, D758-D765

Afzal AJ, Ali S, Rajoka, MI and Siddiqui, KS.(2005) Innovative kinetic and thermodynamic analysis of a purified super active xylanase from *Scopulariopsis* sp. *Applied Biochemistry and Biotechnology* . Jan;120 (1): 51-70

Siddiqui, KS, Bokhari, SA, **Afzal, AJ** and Singh, S(2004) A novel thermodynamic relationship based on Krammers theory for studying enzyme kinetics under high viscosity *IUBMB Life* 56(7): 403–407

Shopinski K, Iqbal J, **Afzal J,** Ahsan R, Shultz J, and Lightfoot DA (2003). Integration of 144 ESTs with the soybean physical map. *Agronomy Abstracts*; 102:388

Iqbal, M.J., **Afzal, J.**, Yaegashi, S., Ruben, E., Triwitayakorn, K., Njiti, V. N., Ahsan, R., Wood, A. J., & Lightfoot, D. A. (2002). A pyramid of loci for partial resistance to *Fusarium solani* f. sp. *glycines* maintains *Myo*-inositol-1-phosphate synthase expression in soybean roots. *Theoretical and Applied Genetics*. Dec; 105(8):1115-1123.

Bokhari, SA, **Afzal, AJ,** Rashid, MH, Rajoka, MI, Siddiqui, KS (2002). Coupling of surface carboxyls of carboxymethylcellulase with aniline via chemical modification: extreme thermostabilization in aqueous and water-miscible organic mixtures. *Biotechnol Prog*. Mar-Apr;18(2):276-81

Afzal, A.J., Bokhari, S.A., Rashid, M.H., Rajoka, M.I., and Siddiqui, K.S. (2000). Two simple and rapid methods for the detection of polymer degrading enzymes on high resolution alkaline cold in situ native (HiRACIN)-PAGE and high resolution in situ inhibited native (HiRISIN)-PAGE. *Biotechnol.Lett.* 22(11) 957-960

Afzal, M, Yasmeen, G, Saleem, M, Butt, P. K, Khattak, A. K. and **Afzal, J.** (2000). TG and DTA study of the thermal dehydration of metal-exchanged zeolite-4A samples. *Journal of Thermal Analysis and Calorimetry*, 62(3), 721-727

Afzal, M., Yasmeen, G, Saleem, M and **Afzal, J** (2000). Temperature-programmed Reduction of Metal-exchanged Zeolite-A Catalysts. *Journal of Thermal Analysis and Calorimetry* 62(1): 277-284

Khattak, A. K.; Afzal, M.; Saleem, M.; Yasmeen, G.; **Afzal, J** (1999). Adsorption of n-aliphatic alcohols in the determination of surface areas of metal-doped alumina samples. *Adsorption Science & Technology*, 17(3), 181-190

Tahir, H, Saleem, M., Afzal, M., Ahmad, H., Hussain, S. T. and **Afzal, J** (1998). Estimation and removal of chromium ions from tannery wastes using zeolite-3A. *Adsorption Science & Technology*, 16(3), 153-161

Under Preparation

Afzal, A.J., Bokhari, S.A., Ghazal, H. and Siddiqui, K.S. A kinetic and thermodynamic study of chemically modified xylanases from *Scopulariopsis sp.* revealed the existence of an essential amino group. *Journal of peptide research*, (Submitted).

Shopinski K., Iqbal J, **Afzal J**, Ahsan R, Shultz J, and Lightfoot DA. Integration of 302 gene families with the soybean physical map. *Theor Appl Genet.* 2005 (submitted).

Shopinski K, Iqbal J, **Afzal J**, Shultz J, Lavu, N, and Lightfoot DA. 2005. A physical map for 202 defense gene families shows paleopolyploid architecture in the soybean genome. *Theor. Appl. . Genet.* (in review)

Shultz, J. L, Yesudas, C., Yaegashi, S., **Afzal, A. J.**, Kazi, S., Lightfoot, D. A. Three Minimum Tile Paths From Bacterial Artificial Chromosome Libraries of the Soybean (*Glycine max* cv. 'Forrest'): Tools for Structural and Functional Genomics. (Manuscript prepared)

Jeffrey Shultz, Kay Shopinski, M. Javed Iqbal¹, Samreen Kazi, Kimberly Zobrist, Satsuki Yaegashi, Deepak Kurunam, Nagajyothi Lavu, **Ahmad Afzal**, Charles Yesudas, M. A. Kassem, Chencang Wu, Hong Bin Zhang, Christopher Town, Khalid Meksem , DAVID A. LIGHTFOOT. The Soybean Genome Database (SGD) Represents Through Gbrowse Physical Maps, Genetic Maps, Homeologous Regions, DNA Markers, Contig Structures, EST Content, BAC End Sequence and DNA Sequence Of *Glycine max*.(Manuscript prepared)

Ahsan R, Iqbal, MJ, **Afzal, A.J**, Jamai, A., Clark, D. and Lightfoot, DA. Cloning and expression of Soybean diphenol oxidase (Laccase) in yeast and bacteria (Manuscript prepared).

Afzal, A.J, Gurha, P and Lightfoot, DA. Tale of two dimers. To homodimerize or heterodimerize. That is the question (Manuscript prepared)

Afzal, A.J, Iqbal, MJ, Wood, AJ and Lightfoot, DA. Plant serine threonine kinases. Role in signaling and plant defense (Manuscript prepared).

Afzal J, Kazi S, Ahsan R, Meksem K, Jamai A., and D.A. Lightfoot. Identification of alleles of Rhg1 that underlie Resistance to Soybean Cyst Nematode. *Soy. Genet. Newslett.*

Afzal, A.J, Wang, J, Kazi, SH and Lightfoot, DA. RHG1 and RHG4. Alpha, beta, beta class of proteins involved in elicitor recognition and dimerization (Manuscript under preparation)

Oral presentation in conferences

Afzal, A.J, Jamai, A, Iqbal, MJ, Kazi, SH, Gillum, J, Wang, J and Lightfoot, AJ. Structure / function analysis of a novel class of resistance protein. RHG1 and SCN resistance. (2004) **Oral presentation:** SIU Tenth Annual Molecular and Cellular Biology Symposium Conference Centre, Grafton, IL

A. J. Afzal, A. Jamai, S. H. Kazi, R. Ahsan, K. Shopinski, S. Yaegashi, M. J. Iqbal and D. A. Lightfoot Cloning and purification of Rhg1: Analysis of regions involved in dimerization and elicitor recognition. **Oral presentation** at 2003 Annual meetings ASA-CSSA-SSSA from November 2-6, Denver, CO pg: 223

A. J. Afzal, M. J. Iqbal, S. Yaegashi, V. N Njiti, J. Shultz and D. A. Lightfoot. mRNA abundance and enzyme activity of Myo-Inositol 1-Phosphate Synthase in Soybean roots Inoculated with *Fusarium solani* f.sp glycines.: **Oral presentation** at the 2002 Annual meetings ASA-CSSA-SSSA, November 10-14, Indianapolis, IN pg:230

**Abstracts
published**

Afzal, A.J., Liu, T., Vasudaven, S., Samudrala, R. and Lightfoot, D.A. (2006) Resistance to the Soybean cyst nematode and the Rhg gene family. CD data and structural prediction show an alpha-beta LRR fold involved in dimerization. Plant and Animal genome. January 14-18 Town & Country Convention Center San Diego, CA. <http://www.intl-pag.org/>

Afzal, A.J., Vasudaven, S., Kazi, S., Iqbal, M.J. and Lightfoot, D.A (2006) Rhg4 cloning and protein purification. Structural and functional elucidation through circular dichroism and surface plasmon resonance. Plant and Animal genome. January 14-18, Town & Country Convention Center San Diego, CA. <http://www.intl-pag.org/>

Afzal, A.J, Kazi, S.H. and Lightfoot, D.A.. (2006) Inclusion bodies contain folding intermediates for RHG1. A novel refolding protocol for protein purification from inclusion bodies. Plant and Animal genome. January 14-18, Town & Country Convention Center San Diego, CA. <http://www.intl-pag.org/>

Jeffery Schultz, Chester Langin, Nagajothi Lavu, M Javed Iqbal, Kay Shopinski, **Jawad Afzal**, Samreen Kazi, Rabia Bashir, Chenchag Wu, Chris Town, Hongbin Zhang and David Lightfoot. Genome evolution-Framework genome comparisons among *Medicago truncatula*, *Arabidopsis thaliana* and *Glycine max* shows separate paleopolyploid genome structures has provided aneuploidy in disease resistance and other trait loci. 2005 Model legume Congress, Pacific Grove, California, June 5-9, 2005, pg:153
<http://www.eugrainlegumes.org/meetings/documents/MLCAbstract1.pdf#search='2005%20model%20legume%20congress'>

Jawaad Afzal, Javed Iqbal, Jianjun Wang, Samreen Kazi and David Lightfoot. RHG1 codominant resistance is encoded by a dimeric alpha beta beta protein involved in signal transduction. SIU 11th annual Molecular and Cellular Biology Symposium, April 22-23, 2005, Grafton, IL. Pg:17

Samreen Kazi, Javed Iqbal, **Jawaad Afzal**, Konokporn Triwityakorn, Aziz Jamai, Jeff Shultz, Khalid Meksem, Prakash Arelli, Jason Bond and David Lightfoot. SIU 11th annual Molecular and Cellular Biology Symposium, April 22-23, 2005, Grafton, IL. Pg: 31

Jeffery Shultz , N Lavu , Chet Langin , Kay Shopinski , S Kazi , R Bashir , J Iqbal , **J Afzal** , C Town , K Meksem , H Zhang , C Wu , David Lightfoot. Uses Of The Soybean Sequence Ready Physical Map. Plant and Animal genome. January 15-19, 2005 Town & Country Convention Center San Diego, CA. http://www.intl-pag.org/pag/13/abstracts/PAG13_W205.html

J Afzal , S Nolte , R Mungur , B Young , L Tolley , DA Lightfoot. High Throughput Metabolic Profiles Using Near Isolines That Contrast For Resistance To SCN And SDS Or Transgenes. Plant and Animal genome, January 15-19, 2005 Town & Country Convention Center San Diego http://www.intl-pag.org/pag/13/abstracts/PAG13_P790.html

Jawaad Afzal , R Ahsan , Samreen Kazi , Chet Langin , MJ Iqbal , DA Lightfoot. Proteomic And Genomic Approaches To Molecular Breeding Of Resistance To Soybean Sudden Death Syndrome And Cyst Nematode In Elite Cultivars. Plant and Animal genome. January 15-19, 2005 Town & Country Convention Center San Diego, CA http://www.intl-pag.org/pag/13/abstracts/PAG13_P781.html

Kazi, Samreen, Iqbal, Javed, **Afzal, Jawad**, Shopinski, Kay, Ahsan, Rubina, Triwityakorn, Kanokporn, Jamai, Aziz, Shultz, Jeff, Meksem, Khalid, Arelli, Prakash, Bond, Jason, Lightfoot, David (2004). Genomic approaches to resist to soybean cyst nematode populations. American society of plant biologists. Annual meeting. <http://abstracts.aspb.org/pb2004/public/P75/8061.html>

M.J. Iqbal , **A.J. Afzal** , R. Ahsan , S Yaegashi , V. Njiti , David Lightfoot. A pyramid of loci for partial resistance to Fusarium Solani F. sp Glycines maintains Myo-Inositol-1-phosphate synthase expression in Soybean roots. Plant and animal genome. January 11-15, 2003. Town & Country Convention Centre, San Diego, CA
http://www.intl-pag.org/pag/11/abstracts/P7b_P796_XI.html

Afzal, AJ, Jamia, A, Iqbal, MJ, Wang, J, Meksem, K and Lightfoot, DA. Cloning and purification of RHG1. Analysis of regions involved in elicitor recognition and dimerization.(2004) 10th Biennial conference of the cellular and molecular biology of the Soybean. August 8-11, Columbia, MO, Soy 2004 pg.89

M. J. Iqbal, K. L. Shopinski, R. Ahsan, **A. J. Afzal**, J. Schultz, M. Sherman and D. A. (2003). Gene expression analysis of soybean roots in response to f.sg inoculation. Annual meetings from November 2-6, Denver, CO pg: 225

K. Shopinski, M. J. Iqbal, S. Yaegashi, R. Ahsan, **A. J. Afzal**, J. Shultz and D. A. Lightfoot. (2003). Physical mapping of ESTs that are differentially expressed in soybean roots in response to SDS. Annual meetings from November 2-6, Denver, CO pg: 224

Poster Presentations

Yasudas, C., Lightfoot, D.A., Shultz, J., Nagajothi, L., Iqbal, M.J., Shopinski, K., **Afzal, J.**, Kazi, S., Bashir, R and Jayaraman, D. Positional cloning of genes underlying QTL for isoflavones, protein, oil and insect resistance in Soybean *Glycine max.* (L.) Merrill. Poster presented at the American society of plant biologists meeting (ASPB) Seattle, WA, July 16-20, 2005

Lightfoot, David A, Shultz, Jeffry , Yesudas, Charles, Lavu, Nagajyothi, Kazi, Samreen, Bashir, Rabia, Iqbal, M Javed., **Afzal, Jawaad.**, Shopinski, Kay M., Jayaraman, Deepak., Wu, Chencang., Town, Christopher., Zhang, Hongbin. The Complete Physical Map of *Glycine max* (L.) Merrill, shows the Paleopolyploid Genome Structure Provides Aneuploidy in Disease Resistance and Other Traits. Poster presented at American Society of Plant Biologists (ASPB), Seattle, WA, July 16-20, 2005.

Yesudas, Charles., Lightfoot, David A., Shultz, Jeffry., Lavu Nagajyothi., Iqbal, Javed M., Shopinski, Kay M., **Afzal, Jawaad.**, Kazi, Samreen., Bashir, Rabia., Jayaraman, Deepak. Positional Cloning of Genes Underlying QTL for Isoflavones, Protein, Oil and Insect Resistance in Soybean, *Glycine max.* (L.) Merrill. Poster presented at American Society of Plant Biologists (ASPB), Seattle, WA, July 16-20, 2005

D.A. Lightfoot, E. Ruben, K. Triwitakorn, J. Aziz, **J. Afzal**, K. Meksem and P.R. Arelli. Evolution of resistance breakdown and gene evolution: Soybean cyst nematode and rhg1. APS • SON • MSA Joint Meeting August 25-29, 2001, Salt Palace Convention Centre, Salt Lake City, Utah

Afzal, AJ, Kazi, SH, Yaegashi, S, Gillum, J and Lightfoot, DA. Detection of Rhg1 Alleles in Illinois Cultivars and 110 PIs from China. Haplotype analysis using Taqman probes: SIU Tenth Annual Molecular and Cellular Biology Symposium Conference Centre, Grafton, IL

Afzal, AJ. Application of Genetic Engineering in Agriculture, A practical course (ICGEB / NIBGE, Feb, (1998). Part of the faculty that conducted practicals related to protein purification.

<http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?DB=pubmed>

Keyword: Afzal

Pubmed /Genebank Submissions

Afzal, A.J., Kazi, S.H., Yaegashi, S., Gillum, J. and Lightfoot, D.A. Polymorphic nucleotides within alleles of the soybean cyst nematode resistance gene Rhg1 from 116 SCN resistant plant introductions from China (2004). Id no: AY598406-598413, AY597055-AY597126 and AY618844-618867

Iqbal, M.J., **Afzal, A.J.**, Ahsan, R., Shultz, J., Meksem, K., Zobrist, K. and Lightfoot, D.A. End sequence of soybean BAC clones: Large-insert soybean genomic library *Glycine max* genomic, genomic survey sequence (2002). Id no: BH860847-BH860901, BH771052-771134, BH614617-BH614626 and BH610092-BH610129

Iqbal, M.J., Yuan, J., **Afzal, A.J.**, Ahsan, R., Shultz, J., Meksem, K. and Lightfoot, D.A. BAC end sequence of *Fusarium solani* f. sp. *glycines* BAC clones (2001). Id no: BH214545-BH214549

**Research
Interests**

- Plant disease resistance
- Protein structure/function/stability relationships
- Metabolite analysis
- Haplotype, Allotype analysis
- Protein refolding and characterization
- Gene/Genome evolution
- Protein dimerization and Elicitor fishing
- Protein Structure Computational Biology
- Enzyme Thermodynamics and Kinetics
- Nano-Technology

Techniques

- Gel electrophoresis: Agarose, PAGE, NEMSA, TUG-PAGE, HIRACIN-PAGE, HIRACIN PAGE, 2D gels
- FPLC and HPLC
- CD and DSC
- Mass Spectrometry, FT-MS
- Southern, Northern, Western and Far western hybridization
- Tissue Print Blot and Pull-down assays
- PCR (Real time, Multiplex)
- Gene cloning
- Protein expression and purification
- Taqman assay for SNP detection
- FRET based protein detection
- DNA Sequencing
- Plant grafting

**Referee for
peer reviewed
Journals**

Served as referee for the following peer reviewed Journals

- Current Microbiology
- Bioresource Technology
- Theoretical and Applied Genetics (TAG)
- Journal of Arid Environments

Languages

(Reading, Writing, Speaking)

English (fluent, fluent, fluent), Urdu (fluent, fluent, fluent), Punjabi (functional, functional, fluent)

Cleared Level 1 (36 hrs), Level 2 (36 hrs) and Level 3 (36 hrs) courses in French language from the Alliances Francaises, Islamabad, Pakistan

Interests

- Computers
- Pool
- Chess
- Theoretical Physics

References

Dr David Lightfoot
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School of Microbiology and Immunology,
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Dr Blaine Bartholomew
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Dr Andrew Wood
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Dr Naushad Ali
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