

CURRICULUM VITAE

Ganesh Kumar Agrawal

Contact Information

Associate Director & Research Co-ordinator
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Adjunct Associate Professor of Biochemistry at Universal Science College (USC;
www.uscollege.edu.np), Kathmandu, Nepal

Carrier Objective

- To unravel the 'regulatory networks' of the signaling and metabolic pathways in organisms - plants and animals - using targeted and global "OMICS" technologies – A SYSTEMS BIOLOGY APPROACH to understand biology as a whole.
 - Bioinformatics for Gene-Protein-Metabolic pathways
 - Exploit the acquired knowledge toward 'technology development' and application (for example, improving seed quality and yield in crop plants)
 - Discover stress/disease-associated biomarkers and their application in drug development
 - Translate acquired knowledge to students and researchers to broaden their horizon

Education

Ph.D. (Applied Biological Chemistry)	Tokyo Univ. of Agri. and Tech.	1998	Japan
M.Sc. (Phy. Chem.)	Tribhuvan University	1989	Nepal
B.Sc. (Phy. + Chem. + Math.)	Bihar University	1986	India

Topic of the Ph.D. Thesis: "Genetic Analysis of the Photosynthetic Gene expression in Cyanobacteria".

Topic of the M.Sc. Thesis: "Biochemical Study of Albinism in Rice".

Professional Experience

- 2007.07 – Present: Adjunct Associate Professor** of Biochemistry at Universal Science College (www.uscollege.edu.np), Kathmandu, Nepal
- 2002.04 – Present:** Associate Director of RLABB since April 1, 2002.
- 2000.04 – Present:** Serving as a **Research Co-ordinator** for Research Laboratory for Agricultural Biotechnology and Biochemistry (RLABB) and Institute of Biodiversity (INB), Kathmandu, Nepal since April 1, 2000 to co-ordinate and accelerate research activities with international institutions/universities. During this time, I have developed skills to interact with scientists involved in different biological research fields, to give oral presentation, to develop collaborative proposals and to write scientific research papers and reports.
- 2007.06 – 2009.03: Senior Research Scientist** at the University of Missouri, Biochemistry Department, Missouri 65211, USA.
- 2006.11 – 2007.05:** Worked as a “Post-doctoral Research Associate” in a NSF (National Science Foundation, USA) funded research grant entitled “Identification and absolute quantification of protein phosphorylation networks in oilseeds” at the University of Missouri-Columbia, Missouri 65211, USA.
- 2004.10 – 2006.10:** Received NSF (National Science Foundation, USA) research grant entitled “Phosphoproteomic Study of Seed-Filling in *Brassica*” as a “**Co-Principal Investigator**”. Applied functional proteomics approaches to systematically identify in vivo phosphoproteins expressed during seed development in *Brassica napus* and *campestris* and to map their phosphorylation sites.
- 2004.04 – 2004.09:** Continued to understand the ‘regulatory networks’ of the signaling and metabolic pathways in plants at the National Institute of Agrobiological Sciences (NIAS), Tsukuba, Japan.
- 2002.04 – 2004.03:** Received a prestigious “**JSPS Post-doctoral Fellowship**” from the Govt. of Japan to unravel the ‘regulatory networks’ of the signaling and metabolic pathways in rice using combination of ‘forward and reverse genetics’ and ‘Omics’ approaches.
- 1999.07 – 2002.03:** Joined again the ‘**Brain Project**’ as a post-doctoral research associate at NIAS, Tsukuba, Japan. Conducted research on “**Rice Functional Genomics**” to generate large scale mutant lines and to develop tools, such as retrotransposon-based strategy, to systematically screen the mutant lines and characterize the loss-of-function mutant gene(s).
- 1998.04 – 1999.06:** Joined the prestigious ‘**Brain Project**’ as a post-doctoral fellow at NFRI (National Food Research Institute), Tsukuba, Japan. Conducted research on “ribosome engineering in bacteria to enhance antibiotic production”.
- 1994.10 – 1998.03:** Earned a **Ph.D. degree** in “**Biochemistry and Biotechnology (Applied Biological Chemistry)**” from the United Graduate School of Agricultural Science based at the Tokyo University of Agriculture and Technology, Tokyo, Japan in 1998. Received the prestigious **Monbusho Scholarship** (Govt. of Japan) award for this Ph.D. study.
- 1993.05 – 1994.09:** Resumed research in RLABB as a **Senior Research Scientist** and as a **Head of the Research Group**.
- 1992.11 – 1993.04: Visiting Researcher** at the Ohio State University (Ohio, USA) supported generously by **USAID/PSTC** and worked with **Prof. P. E.**

Kolattukudy on characterization of eukaryotic promoter - Tobacco Anionic Peroxidase gene (TAP1) at Ohio State Biotechnology Center, Ohio, USA.

1989.10 – 1992.10: Started **research carrier in RLABB**, Nepal, as a junior researcher. Conducted research on internationally-funded projects: “improvement of cold tolerant rice cultivars of Nepal”, “sex determination of a strict dioecious plant (locally called LAPSI)”, and “development of low erucic acid *Brassica Campestris* var Toria”.

Research Experience

Systems Biology: Multidisciplinary research demands a broad range of technical expertise. I have the following technical expertise in targeted and high-throughput techniques for biochemistry, biotechnology and bioinformatics required to conduct systems biology.

- **Computational Biology:** (i) Create business requirement documents (BRD) and design workflow to help programmers for developing user-friendly automated programs to process large-scale experimental data derived from high-throughput technologies such as transcriptomics, proteomics and metabolomics. (ii) Validation and user acceptance testing of these programs.
- **Bioinformatics:** Molecular modeling, kinetic and system modeling and bioinformatics; Genome annotation and interpretation; Mass spectrometry acquired data processing using Sequest-based BioWorks, Mascot, Scaffold, and other softwares. Data interpretation for publication in scientific journals; DeCyder MS software for label-free quantification.
- **Computational Skills:** General and advanced Window and MacIntosh-based computer programs for scientific purpose.
- **“Omics” Technologies:** Possess expertise, including extensive targeted and high-throughput bench-level working knowledge, in three “Omics” technologies – Transcriptomics, Proteomics and Metabolomics. Knowledge in integrating data derived from these technologies.
- **Microarray Data Analysis:** GeneSpring software.
- **Gel-based Protein Separation Technologies:** One and two dimensional gel electrophoresis (1- and 2-DGE), Differential in-gel electrophoresis (DIGE), Blue-Native PAGE (BN-PAGE), and Other Native PAGEs.
- **Image Acquisition and Analysis:** Image acquisition of gel using scanner such as Typhoon 9410 variable mode imager followed by down-stream analysis using ImageMaster Platinum software, PDQuest software, Phoretix, or Decyder software.
- **Mass Spectrometry:** Extensive experience in operating and maintaining Linear Ion Trap LTQ-ETD LC-MS/MS, Orbitrap, Orbitrap-ETD, Q-TOF, and Triple Quad for protein identification, global and targeted phosphosites mapping [collision-induced dissociation (CID) and electron transfer dissociation (ETD) type fragmentations], and their relative & absolute quantifications. Fractionation of complex proteins; technology development [such as Multi-Dimensional Protein Identification Technology (MudPIT) and semi-continuous MudPIT] and application.
- **Protein Network:** Protein-protein interaction using Yeast-two/three-hybrid systems, TAP tagging, Secretomics.

- **Metabolomics:** Targeted and low-throughput analysis of metabolites. LC-MS/MS, GC-MS/MS, NMR. Metabolic Dynamics – PCA analysis, O-PLS STOCSY, Batch Processing.
- **Functional Genomics of Plants, Bacteria and Cyanobacteria**
- **Genetics Approach:** Forward and reverse genetics approaches for systematic and large-scale analysis of phenotype and function of gene(s).
- **Biotechnology and Omics-assisted Crop Improvement in 21st Century**
- **Transgenic Approaches:** Overexpression and RNA interference (RNAi) strategies to dissect gene function.
- **Molecular Biology Techniques including Recombinant technologies and Biochemistry:** For example, techniques such as cloning, sequencing, isolation and purification of DNA & RNA, Southern analysis, northern analysis, western analysis, PCR, real time PCR, fatty acids analysis, inner and surface lipids by thin-layer chromatography, immunoprecipitation, development of affinity column, protein purification, ELISA, kinase assay etc.
- **Protein and enzyme purification and their biochemical characterization**
- **Promoter Analysis of Plant and Cyanobacterial genes:** Tobacco Anionic Peroxidase gene (*TAPI*) of plant and photosynthetic gene of cyanobacteria (*psbA*).
- **Antibiotic Production:** Ribosome Engineering in Bacteria.
- **Antibody Production**
- **Plant Cell and Tissue Culture**
- **Anther culture & Molecular Marker-Assisted Breeding for Crop Improvement**
- **Establishment, Use of and Maintenance of Plant and Animal Cell Culture Lines**

Teaching Experience

- More than 8 years teaching experience in CHEMISTRY, BIOCHEMISTRY, BIOTECHNOLOGY, and newly & rapidly emerging subject of SYSTEMS BIOLOGY encompassing high-throughput technologies - proteomics, metabolomics and transcriptomics
- Taught to Undergraduate, Graduate and Ph.D. Students in Nepal, India, Japan and USA
- Both long-term research and teaching experiences resulted in a comprehensive text book for students and established researchers

Honors, Awards, Scholarships, and Fellowships

- JSPS Short-Term Fellowship (December 2, 2010 to February 2, 2011)
- JSPS Fellowship (Govt. of JAPAN)
- Monbusho Scholarship (Govt. of JAPAN)
- US Agency for International Development (USAID) visiting researcher award

Synergistic Activities

- **Research co-ordinator** (As of April 1, 2000)
- **Associate Director of RLABB** (As of April 1, 2002)
- **Editorial responsibilities**
 - **Assistant Chief Editor:** International Journal of Life Sciences (IJLS).
 - **Journals' reviewer:** Proteomics; Electrophoresis; Journal of Proteome Research; Journal of Proteomics, Planta; Gene; Molecular Plant-Microbe Interaction; Plant Physiology; Physiologia Plantarum; Plant, Cell & Environment; Phytochemistry; Plant Science; BBA – Gene Structure and Expression; Crop Science, Plant Physiology and Biochemistry; Journal of Plant Physiology; Journal of Agriculture and Food Chemistry (JAFc); Journal of Plant Pathology; Gene Regulation and Systems Biology; Acta Biochimica et Biophysica Sinica (ABBS); Pesticide Biochemistry and Physiology; and Journal of Plant Interactions.
- **Member of Association and Societies**
 - American Society of Plant Physiology (since Year 2008 to 2009)
 - Institute of Biodiversity, Kathmandu, Nepal (since 1995)
 - Research committee of Universal Science College (USC), Maitidevi, Kathmandu, Nepal (As of August 1, 2004)
- **Research grant evaluation:** Research proposals reviewer for:
 - National Science Foundation (NSF)
 - The United State-Israel Bi-national Science Foundation (BSF)
 - European Union (EU) Grant Application
- **Education**
 - **Adjunct Associate Professor** of Biochemistry at Universal Science College (www.uscollege.edu.np), Kathmandu, Nepal (as of July 1, 2007)
 - Involved in designing the syllabus and giving lectures on BIOCHEMISTRY (for specialization in clinical and medicinal biochemistry), GENOMICS, PROTEOMICS and SYSTEMS BIOLOGY.
 - Conduct 'Proteomics Workshop'.
- **Invited Editor/Writer of BOOKS**
 - Plant Proteomics: Technologies, Strategies, and Applications (Editors: Ganesh Kumar Agrawal and Randeep Rakwal), September 2008, John Wiley & Sons, Inc. (the Publisher), New Jersey, USA. ISBN 978-0-470-06976-9, Hardcover, 808 Total Pages
 - Rice Proteomics: Technologies for Next Generation Crop Plants (Editors: Ganesh Kumar Agrawal and Randeep Rakwal), John Wiley & Sons, Inc. (the Publisher), New Jersey, USA (In Progress for 2011 Publication)
 - Seed Development: OMICS Technologies Toward Improvement of Seed Quality and Crop Yield (Editors: Ganesh Kumar Agrawal and Randeep Rakwal), Springer (the Publisher), USA (In Progress for 2011 Publication)
- **International Collaborations**
 - Established Working & Active Collaborations with Internationally Renowned Scientists
 - **Prof. Shigeru Tamogami, Ph.D.** at Laboratory of Growth Regulation Chemistry, Department of Biological Production, Akita Prefectural University, Akita 010-0195, **JAPAN**. Tel./Fax: +81-018-

872-1637/+81-018-872-1678; E-Mail: tamo_chem@akita-pu.ac.jp:
Organic Synthesis/Jasmonates/Plant Phytoalexins

- **Dr. Randeep Rakwal, Ph.D.**
Professor, Graduate General Education Courses, Graduate School of Life and Environmental Sciences, University of Tsukuba, 1-1-1 Tennoudai, Tsukuba, Ibaraki 305-8572, Japan,
& Senior Scientist, RLABB, Kathmandu, Nepal; Lecturer & Guest Researcher at Department of Anatomy & Anti-aging Medicine Funded Research Laboratories, Showa University School of Medicine, Tokyo 142-8555, TEL (Lab): +81-3-3784-6815, Japan; AND Faculty of Science, Toho University, Chiba, Japan: TEL (Mobile) : (+81) 090-1853-7875; E-mail: plantproteomics@gmail.com: OMICS Technologies in Human Health and Food Security
- **Dr. Nam-Soo Jwa, Ph.D. (Associate Professor)** at Department of Molecular Biology, College of Life Science, Sejong University, 98 Kunja-Dong, Kwangjin-Gu, Seoul 143-747, **KOREA**. Tel./Fax: +82-2-3408-3645/+82-2-3408-3661; E-Mail: nsjwa@sejong.ac.kr: Plant Pathogen Interactions using targeted and Omics approaches
- **Dr. Birgit Kersten, Ph.D. (Senior Scientist)** at BIO-INFORMATICS Fachgebiet Genomforschung (Department Genome Research), Johann Heinrich von Thünen- Institut (vTI), Bundesforschungsinstitut für Ländliche Räume, Wald und Fischerei – Institut für Forstgenetik (Institute of Forest Genetics) - Sieker Landstr. 2, 22927 Großhansdorf, **GERMANY** E-mail: birgit.kersten@vti.bund.de: [Tree Genome Research/Transcriptomics/Proteomics/Bioinformatics/Genome Annotation](#)
- **Prof. Masami Yonekura, Ph.D. (Head)** at Food Function Laboratory, College of Agriculture, Ibaraki University, Ami 3-21-1, Ibaraki 300-0393, **JAPAN**. Tel./Fax: +81-29-888-8683; E-Mail: yonekura@ipc.ibaraki.ac.jp: Food security and screening
- **Dr. Shoshi Kikuchi, Ph.D. (Head)** at Plant Genome Research Unit, Division of Genome and Biodiversity Research, National Institute of Agrobiological Sciences (NIAS), Kannondai 2-1-2, Tsukuba, Ibaraki 305-8602, **JAPAN**; TEL/FAX: +81-29-838-7007; E-mail: skikuchi@nias.affrc.go.jp: Rice Microarrays/Bioinformatics/Genome annotation
- **Dr. Akihiro Kubo, Ph.D. (Senior Researcher)** at Environmental Biology Division, National Institute for Environmental Studies, 16-2 Onogawa, Tsukuba, Ibaraki 305-8506, **JAPAN**. TEL: +81-29-850-2391, 2435, FAX: +81-29-850-2391; E-mail: kub@nies.go.jp: Omics in Gaseous Pollutants
- **Dr. Shinzo Kimura, Ph.D.** at Human Engineering and Risk Management Research Group, Japan NIOSH, Kawasaki, **JAPAN**. E-mail: kimura@h.jniosh.go.jp: Radiation Research Using Rice as Grass Model
- **Dr. Yoshinori Masuo** at Laboratory of Neuroscience, Department of Biology, Faculty of Science, Toho University, 2-2-1 Miyama, Funabashi, Chiba 274-8510, **JAPAN**. E-Mail:

yoshinori.masuo@bio.sci.toho-u.ac.jp: Mental Stress and Brain OMICS

- **Dr. Oliver AH Jones, Ph.D.** at The Christopherson Building, School of Engineering & Computing Sciences, University of Durham, South Road, Durham DH1 3LE, UK: E-mail: oliver.jones@durham.ac.uk: Metabolomics
- **Dr. Sun Tae Kim, Ph.D. (Associate Professor)** Department of Plant Bioscience, College of Natural Resources & Life Science, Pusan National University, 50 Cheonghak, Samrangjin, Miryang 627-706, **KOREA**. Tel./Fax: +82-055-350-5505; E-Mail: stkim71@pusan.ac.kr, stkim5505@gmail.com: Plant-Pathogen interactions/Secretome/Proteomics/Biotic & Abiotic Stress

Research Grant Awarded

- National Science Foundation (USA)-funded DCC-PGR project “Phosphoproteomic Study of Seed-Filling in *Brassica*” (Year October 2004 – September 2006, 24 Months): **Co-Principal Investigator**.

Research Grant In Preparation (In Collaboration with International Groups)

- Bioinformatics of phosphoprotein and phosphorylation sites in plant and animal systems.
- Development of bioinformatics tools to annotate secreted proteins in plants and animals
- Annotation of MAPKs in the genomes of sequenced plants
- Global functional analysis of rice MAPKKs
- Global and comparative phosphoproteomics of rice and Arabidopsis life cycle
- Phosphoproteomics of MAP kinases signaling in plant and mammalian systems
- Identification of potential bioindicator plants against ozone pollution

Research Publications

Book Chapters (Invited)

Agrawal GK, Rakwal R. 2011. Proteomics of developing seeds in monocotyledonous and dicotyledonous model plants: comparative view on storage reserves and metabolic protein networks. In: **SEED DEVELOPMENT: OMICS Technologies Toward Improvement of Seed Quality and Crop Yield** (Editors: Ganesh Kumar Agrawal and Randeep Rakwal). Springer, Germany, pp. 000-000. (**IN PRESS**).

Agrawal GK, Rakwal R. 2011. Phosphoproteomics of developing seeds reveals extensive phosphorylation and new insights into seed biology. In: **SEED DEVELOPMENT: OMICS Technologies Toward Improvement of Seed Quality and Crop Yield** (Editors: Ganesh Kumar Agrawal and Randeep Rakwal). Springer, Germany, pp. 000-000. (**IN PRESS**).

Cho K, Han O, Tamogami S, Shibato J, Kubo A, **Agrawal GK**, Rakwal R. 2011. Quantification of jasmonic and salicylic acids in rice seedling leaves. In: **Methods in Molecular Biology: Rice Protocols** (Editor: Y. Yang). The Humana Press, New Jersey, USA, pp. 000-000. (**IN PRESS**).

Agrawal GK, Jwa NS, Jung YH, Kim ST, Kim DW, Cho K, Shibato J, Rakwal R 2011. Rice proteomics: Sample preparation to protein identification, In: **Methods in Molecular Biology: Rice Protocols** (Editor: Y. Yang). The Humana Press, New Jersey USA, pp. 000-000. (**IN PRESS**).

Masuo Y, Hirano M, Shibato J, Nam HW, Fournier I, Celine M, Wisztorski M, Salzet M, Soya H, **Agrawal GK**, Ogawa T, Shioda S, Rakwal R. 2011. Brain proteomics: Sampling preparation techniques for the analysis of rat brain samples using mass spectrometry. In: **Sample Preparation in Biological Mass Spectrometry** (Editors: Alexander Ivanor and Alexander Lazarev). Springer, USA, pp. 000-000. (**IN PRESS**).

Tamogami S, **Agrawal GK**, Rakwal R. 2011. Targeted quantitative analysis of JA and its amino acid conjugates in plants using HPLC-electrospray ionization-tandem mass (ESI-LC-MS/MS) spectrometry. In: **Sample Preparation in Biological Mass Spectrometry** (Editors: Alexander Ivanor and Alexander Lazarev). Springer, USA, pp. 000-000. (**IN PRESS**).

Zargar SM, Nazir M, Cho K, Kim DW, Kubo A, Jones OAH, Sarkar A, Agrawal SB, Shibato J, Kubo A, Jwa NS, **Agrawal GK**, Rakwal R. 2011. Impact of climatic changes on crop agriculture: OMICS for sustainability & next generation crops. In: **Sustainable Agriculture and New Bio-Technologies** (Ed.: B. Nouredine). Taylor & Francis, CRC Press, pp. 000-000. (**IN PRESS**)

Agrawal GK, Thelen JJ. 2009. A modified Pro-Q DPS staining protocol for phosphoprotein detection in polyacrylamide gels. In: 'The Protein Protocols Handbook' (3rd Edition; Editor: John M. Walker). The Humana Press, New Jersey, USA, pp. 000-000. (**IN PRESS**)

Gao J, **Agrawal GK**, Thelen JJ, Obradovic Z, Dunker AK, Xu D. 2009. A new machine learning approach for protein phosphorylation site prediction in plants. In: **BICoB** (Editor: S. Rajasekaran). Springer-Verlag Berlin Heidelberg, pp. 18-29. **OR Lecture Notes Computer Science** 5462/2009: 18-29

Agrawal GK, Thelen JJ. 2009. A high-resolution two dimensional gel- and Pro-Q DPS-based proteomics workflow for phosphoprotein identification and quantitative profiling. In: **Methods in Molecular Biology** (Editor: Marjo de Graauw). The Humana Press, New Jersey, USA, Volume 527, pp. 3-19.

Jung YH, **Agrawal GK**, Rakwal R, Jwa NS. 2008. Secretome – Toward deciphering the secretory pathways and beyond. In: 'Plant Proteomics: Technologies, Strategies, and Applications' (Editors: Ganesh Kumar Agrawal and Randeep Rakwal). John Wiley & Sons, Inc., New Jersey, USA, pp. 83-89 (Chapter 6).

Agrawal GK, Rakwal R. 2008. Rice proteome at a glance. In: 'Plant Proteomics: Technologies, Strategies, and Applications' (Editors: Ganesh Kumar Agrawal and

Randeep Rakwal). John Wiley & Sons, Inc., New Jersey, USA, pp. 165-178 (Chapter 11).

Hajduch M, **Agrawal GK**, Pret'ová A. 2008. Proteomics studies in flowering plants – Case of model plant *Arabidopsis thaliana*. In: Floriculture, Ornamental and Plant Biotechnology: Advances and Topical Issues (1st Edition, Volume 5; Editor: Teixeira da Silva), Global Science Books, pp. 334-347.

Deepak SA, Rakwal R, **Agrawal GK**, Shibato J, Oros G. 2008. Gene quantification and disease diagnostics using real-time polymerase chain reaction. In: **Cellular and Biochemical Science** (Editor: G. Tripathi), IK International, New Delhi, India, Section 10.

Hajduch M, **Agrawal GK**, Thelen JJ. 2007. Proteomics of oil seed plants. In: 'Plant Proteomics' (Editors: J. Samaj and Jay J. Thelen). Springer, Heidelberg, Germany, pp. 137-154.

Hirochika H, Miyao A, Yamazaki M, Takahashi A, **Agrawal GK**, Cheng C, Yamashita Y, Harada M, Nakamura H, Hakata M, Ichikawa H. 2007. Tissue culture–induced mutations and overexpression of full-length cDNAs as a tool for functional analysis of rice genes. In **Rice Genetics V**: pp 77-84, D. S. Brar, D. J. Mackill, and B. Hardy, World Scientific Publishing Co.

Hirochika H, Miyao A, Yamazaki M, Takeda S, Abe K, Hirochika R, **Agrawal GK**, Watanabe T, Sugimoto K, Sasaki T, Murata K, Tanaka K, Onosato K, Miyazaki A, Yamashita Y, Kojima N. 2001. Retrotransposons of rice as a tool for the functional analysis of genes. In **Rice Genetics IV**: Proceedings of the Fourth International Rice Genetics Symposium, 22-27, October 2000, Los Banos, Philippines. New Delhi (India): Science Publishers, Inc., and Los Banos (Philippines): International Rice Research Institute. pp 279-292.

Review Articles (Invited)

Tamogami S, **Agrawal GK**, Rakwal R. 2011. Duality of foreign/domestic jasmoantes in regulating plant defense. **Advances in Botanical Research (Manuscript in Preparation)**.

Kersten B, Kleessen S, Neigenfind J, Riano-Pachon D, **Agrawal GK**, Rakwal R, Schulze W. 2011. Linking protein kinases to phosphorylation sites in plants: Paving a road to signaling and metabolic topologies. **Proteomics (Manuscript under Preparation)**.

Tamogami S, **Agrawal GK**, Rakwal R. 2011. Jasmonates to jasmolites in plants: past, present, and future. **Adv. Botanical Res.** 00: 000-000 (**SUBMITTED**).

Agrawal GK, Job D, Zivy M, Agrawal VP, Bradshaw RA, Dunn MJ, Haynes PA, van Wijk KJ, Kikuchi S, Renaut J, Weckwerth W, Rakwal R. 2011. Time to articulate a vision for the future of plant proteomics – a global perspective: an initiative for

establishing the International Plant Proteomics Organization (INPPO). **Proteomics** 00: 000-000 (IN PRESS). doi: 10.1002/pmic.201000608.

Agrawal GK, Rakwal R. 2011. Rice proteomics: a move toward expanded proteome coverage to comparative and functional proteomics uncovers the mysteries of rice and plant biology. **Proteomics** 00: 000-000 (IN PRESS). doi: 10.1002/pmic.201000696.

Agrawal GK, Bourguignon J, Ephritikhine G, Rolland N, Ferro M, Jaquinod M, Kitsios G, Chakraborty N, Jolivet P, Chardot T, Doonan JH, Rakwal R. 2010. Plant organelle proteomics: Collaborating for proper cell function. **Mass Spectrometry Reviews** 00: 000-000 (IN PRESS). doi: 10.1002/mas.20301.

Cho K, Tiwari S, Agrawal SB, Torres NL, Agrawal M, Sarkar A, Shibato J, **Agrawal GK**, Kubo A, Rakwal R. 2011. Troposphere ozone and plants: Absorption, responses and consequences. **Rev Environ Contam Toxicol** 212: 61-111.

Zargar SM, Nazir M, **Agrawal GK**, Kim DW, Rakwal R. 2010. Silicon in plant tolerance against environmental stressors: Towards crop improvement using omics approaches. **Current Proteomics** 7: 135-143.

Agrawal GK, Jwa NS, Lebrun MH, Job D, Rakwal R. 2010. Plant secretome: Unlocking secrets of the secreted proteins. **Proteomics** 10: 799-827. (Annual Review Issue)

Cho K, **Agrawal GK**, Jwa NS, Shibato J, Torres NL, Kubo A, Rakwal R. 2009. Rice OsSIPK: A central component of ozone-triggered physiological responses. **Plant Signaling & Behavior** 4: 448-450.

Cho K, **Agrawal GK**, Jwa NS, Kubo A, Rakwal R. 2009. Rice OsSIPK and its orthologs: A central master switch" for stress responses. **Biochem. Biophys. Res. Commun.** 379: 649-653.

Agrawal GK, Jwa NS, Rakwal R. 2009. Rice proteomics: end of phase I and beginning of phase II. **Proteomics** 9: 935-963. (Annual Review Issue)

Kersten B, **Agrawal GK**, Durek P, Neigenfind J, Schulze W, Walther D, Rakwal R. 2009. Plant phosphoproteomics: an update. **Proteomics** 9: 964-988. (Annual Review Issue)

Goel A, Rakwal R, **Agrawal GK**. 2007. Human heart failure: A proteomics perspective. **Current Proteomics** 4: 174-181.

Deepak SA, Kottapalli KR, Rakwal R, Oros G, Rangappa KS, Iwahashi H, Masuo Y, **Agrawal GK**. 2007. Real-time PCR: Revolutionizing detection and expression analysis of genes. **Current Genomics** 8: 234-251.

Zargar SM, Mushtaq R, Joshi M, Prasad DT, Bhat NA, **Agrawal GK**, Rakwal R. 2007. Cre-Lox: A tool for removal of marker genes to make GM foods safe. **J. Crop Sci. Biotech.** 10: 73-78.

Kottapalli KR, Kottapalli P, **Agrawal GK**, Kikuchi S, Rakwal R. 2007. Recessive bacterial leaf blight resistance in rice: Complexity, challenges and strategy. **Biochem. Biophys. Res. Commun.** 355: 295-301.

Agrawal GK, Jwa NS, Iwahashi Y, Yonekura M, Iwahashi H, Rakwal R. 2006. Rejuvenating rice proteomics: Facts, challenges, and visions. **Proteomics** 6: 5549-5576. "**HIGHLIGHTED ON THE COVER PAGE**" (Annual Review Issue)

Kersten B, **Agrawal GK**, Iwahashi H, Rakwal R. 2006. Plant phosphoproteomics: A long road ahead. **Proteomics** 6: 5517-5528. (Annual Review Issue)

Jwa NS, **Agrawal GK**, Tamogami S, Yonekura M, Han O, Iwahashi H, Rakwal R. 2006. Defense/stress-related marker genes, proteins and secondary metabolites in defining rice self-defense mechanisms. **Plant Physiol. Biochem.** 44: 261-273.

Agrawal GK, Rakwal R. 2006. Rice proteomics – a cornerstone for cereal food crop proteomes. **Mass Spectrometry Reviews** 25: 1-53.

Agrawal GK, Yonekura M, Iwahashi Y, Iwahashi H, Rakwal R. 2005. System, trends & perspectives of proteomics in dicot plants. Part I: Technologies in proteome establishment. **J. Chromatogr. B Analyt. Technol. Biomed. Life Sci.** 815: 109-123.

Agrawal GK, Yonekura M, Iwahashi Y, Iwahashi H, Rakwal R. 2005. System, trends & perspectives of proteomics in dicot plants. Part II: Proteomes of the complex developmental stages. **J. Chromatogr. B Analyt. Technol. Biomed. Life Sci.** 815: 125-136.

Agrawal GK, Yonekura M, Iwahashi Y, Iwahashi H, Rakwal R. 2005. System, trends & perspectives of proteomics in dicot plants. Part III: Unraveling the proteomes influenced by the environment, and at the levels of function & genetic relationships. **J. Chromatogr. B Analyt. Technol. Biomed. Life Sci.** 815: 137-145.

Agrawal GK, Tamogami S, Han O, Iwahashi H, Rakwal R. 2004. Rice octadecanoid pathway. **Biochem. Biophys. Res. Commun.** 317: 1-15.

Rakwal R, **Agrawal GK**. 2003. Rice proteomics: current status and future perspectives. **Electrophoresis** 24: 3378-3389.

Rakwal R, **Agrawal GK**. 2003. Wound signaling - coordination of the octadecanoid and MAPK pathways. **Plant Physiol. Biochem.** 41: 855-861.

Agrawal GK, Iwahashi H, Rakwal R. 2003. Small GTPase 'Rop': molecular switch for plant defense responses. **FEBS Letters** 546: 173-180.

Agrawal GK, Iwahashi H, Rakwal R. 2003. Rice MAPKs. **Biochem. Biophys. Res. Commun.** 302: 171-180.

Research Articles

Year 2011

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Workshops and Conferences/Seminars Attended

- Attended the 23rd Annual Missouri Symposium Plant Roots: From Genes to Form and Function! Held at University of Missouri-Columbia, The Christopher Bond Life Sciences Center, Columbia, Missouri 65211, USA.
- LC/iTRAQ workshop organized by University of Missouri-Columbia Proteomics Center at Life Sciences Center, Columbia, Missouri, USA, on January 25th 2006.
- Attended "Plant Immunity" Signaling to acquired resistance held at Tsukuba International Congress Center, Epochal Tsukuba, Japan, from March 4-5, 2004, and organized by NIAS-COE/PROBRAIN/TOKUTEI Joint International Symposium.
- Attended International Rice Genome Meeting held at Tsukuba International Congress Center, Epochal Tsukuba, Japan, from February 4-6, 2004, and organized by Rice Genome Research Program (RPG), Japan.
- NIAR-COE/BRAIN/CREST Joint International Symposium on "Self-defense Signaling pathways in Plants" held in Tsukuba International Congress Center, Epochal Tsukuba, Tsukuba, Ibaraki Prefecture, Japan (Nov. 16-17, 2000).
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- Seminar Organized by Nepal Chemical Society in 1992, 1991, and 1990 in Kathmandu, Nepal.
- International Conference on Genetic Engineering and Biotechnology (ICGEB), April 15-20, 1991, Kathmandu, Nepal.
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- Winter mini school on genetic engineering techniques organized by RLABB, and conducted by Dr. Asad Ahmed, University of Alberta, Canada, in Kathmandu, Nepal (Nov. 19-23, 1989).
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