

## BIOGRAPHICAL SKETCH

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### BARBARA VALENT

University Distinguished Professor

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### Education and Training

B.A., Chemistry, University of Colorado (Boulder) 1972  
Ph.D., Biochemistry, University of Colorado (Boulder) 1978  
NIH Post-Doctoral Fellow, Yeast Molecular Genetics, Cornell University. 1980-1982

### Professional Experience

2002 – Present University Distinguished Professor, Kansas State University  
2001 – 2002 Professor of Plant Pathology, Kansas State University  
1997 - 2001 Research Fellow, DuPont Agricultural Products  
1985 - 1997 Research Scientist progressing to Research Manager  
Plant Sciences, DuPont Central Research and Development  
1982 - 1985 Senior Research Associate, Chemistry, University of Colorado, Boulder

### Honors and Awards

2015 American Society of Plant Biologists “Top Author” in The Plant Cell for 2009 to 2013  
2012 17<sup>th</sup> Annual John S. Karling Lecture, Mycological Society of America  
2012 Distinguished Lectures in Microbiology, University of Wisconsin, May 3, Madison  
2010 Mentor Award, Graduate Student Association, KSU Department of Plant Pathology  
2010 Richard R. Nelson Memorial Lecture, Department of Plant Pathology, Pennsylvania State University, University Park, PA  
2007 Fellow, American Association for the Advancement of Science  
2007 Fellow, American Phytopathological Society  
2006 Whetzel-Wescott-Dimock Distinguished Lecturer, Plant Pathology, Cornell University  
1996 1st Annual John S. Karling Lecture, Mycological Society of America  
1994 Garrett Memorial Lectureship, Annual Meeting of the British Society of Plant Pathology, Lancaster, United Kingdom  
1989 Opening Plenary Session Lecture, “Rice blast as a model system for plant pathology,” Annual meeting of the American Phytopathological Society, August 21, Richmond, VA  
1980-82 NIH National Research Service Award  
1978 Phi Beta Kappa

### Synergistic Activities

1. Fungal Community Service: Fungal Genetics Policy Committee, 1986-1991; Chair of Rice Blast Genetics Policy Committee since 2001; Advisory Board, NSF PGRP Project “Functional Genomics of *M. grisea*” (2001-2005); Co-Chair, 4th International Rice Blast Congress, Hunan, China, October 2007; Organizing Committee Member, 5th International Rice Blast Congress, Arkansas, August, 2010; NSF Co-PI, Community annotation of the fungal genome, *Magnaporthe*

*grisea-Oryza sativa* Interaction Database (<http://www.mgosdb.org/>); Fungal Genetics Policy Committee, 2005-2011; Organizing Committee Member, 6th International Rice Blast Congress, South Korea, August 2013; Advisory Board Member for the Fungal Genetics Stock Center since 2015. Organizing Committee Member, 7th International Rice Blast Congress, the Philippines, October, 2016.

2. Wheat Blast Community Service: Project Director, USDA-NIFA Integrated Project (2013-2018) entitled “Novel Strategies for Managing Blast Diseases on Rice and Wheat.” Leading an interdisciplinary team of research and Extension specialists from diverse universities and institutions in the U.S. and South America. Goals are to leverage knowledge from blast research to improve U.S. rice production and to prepare for potential introduction of wheat blast, a new disease in South America, into the US wheat crop; Participant - 1<sup>st</sup> International Wheat Blast Workshop, Brazil, 2010; Founding member - International Wheat Blast Consortium to coordinate global wheat blast research; Project Leader - Development of the Recovery Plan for Wheat Blast Disease, National Plant Disease Recovery System, Homeland Security Presidential Directive 9. 2014 and ongoing: Reviewer for the USDA-APHIS New Pest Response Guideline (NPRG) for wheat blast (*Magnaporthe oryzae*). Vice-chair for organization of the 2nd International Workshop on Wheat Blast (IWWB) to be held April 6-10, 2016, at Costão do Santinho, Florianópolis, Brazil.

3. Selected service to Professional Societies: American Phytopathological Society – Member/Chair of Awards and Honors Committee (2011-2015); AAAS – Member-at-Large, Sec. O, Agriculture, Food, and Renewable Resources (2009-2013); Member/Chair of Electorate Nominating Committee of Section O (1997-1999).

4. Selected National and International Committees and Boards: Selection jury for the Wolf Prize in Agriculture (2000-2001); Board of Trustees, Centro Internacional de Agricultura Tropical (CIAT), 1999-2006; Scientific Advisory Board, Max Planck Institute for Terrestrial Microbiology, Marburg, Germany since 2009; Non-Resident Fellow, The Samuel Roberts Noble Foundation Inc, Plant Biology Division since 2009.

5. Contributions to Education: Chair - Kansas State University Interdepartmental Genetics Program since 2004. Member - Biotechnology Curriculum Planning Committee since 2010. Major Professor for 5 graduate students (4 have completed PhDs at KSU), 12 post-doctoral fellows, 8 undergraduates and 3 exchange students (from Korea, Germany, Colombia). At KSU, served on graduate student committees for 28 PhD or MS students. Current Teaching: Fungal Genetics (PLPTH927); Resistance to Plant Disease (PLPTH755); Molecular Plant Microbe Interactions (PLPTH910).

#### **Refereed Journal Articles since 2000:**

Oliveira-Garcia, E. and **B. Valent**. 2015. How eukaryotic filamentous pathogens evade plant recognition, *Current Opinion in Microbiology*, doi:10.1016/j.mib.2015.06.012.

Shew, A.M., L.L. Nalley, D.M. Danforth, B.L. Dixon, R.M. Nayga, Jr., A.-C. Delwaide and **B. Valent**. 2015. Are all GMO's the same? Consumer acceptance of cisgenic rice in India. *Plant Biotechnology Journal*, In Press.

Cruz, C. D., J. Kiyuna, W.W. Bockus, T.C. Todd, J.P. Stack and **B. Valent**. 2015. *Magnaporthe*

- oryzae* conidia on basal wheat leaves as a potential source of wheat blast inoculum. *Plant Pathology*, doi: 10.1111/ppa.12414.
- Gong X., O. Hurtado, B. Wang, C. Wu, M. Yi, M.C. Giraldo, **B. Valent**, M. Goodin and M. Farman. 2015. pFPL vectors for high-throughput protein localization in fungi: detecting cytoplasmic accumulation of putative effector proteins. *Molecular Plant-Microbe Interactions*, 28: 107-121.
- Bakkeren, G. and **B. Valent**. 2014. "Do pathogen effectors play peek-a-boo?" *Frontiers in Plant Science* 5:731, doi: 10.3389/fpls.2014.00731
- Giraldo, M.C., and **B. Valent**. 2013. Filamentous plant pathogen effectors in action. *Nature Reviews Microbiology* 11: 800-814
- Giraldo, M.C., Y.F. Dagdas, Y.K. Gupta, T.A. Mentlak, M. Yi, A. L. Martinez-Rocha, H. Saitoh, R. Terauchi, N.J. Talbot, **B. Valent**. 2013. Two distinct secretion systems facilitate tissue invasion by the rice blast fungus *Magnaporthe oryzae*. *Nature Communications* 4:1996, doi:10.1038/ncomms2996
- Yi, M. and **B. Valent**. 2013. Communication between filamentous pathogens and plants at the biotrophic interface. *Annual Review of Phytopathology* 51: 587-611
- Park, C-H, S. Chen, G. Shirsekar, B. Zhou, C.H. Khang, P. Songkumarn, Y. Ning, M. Bellizzi, **B. Valent**, and G.-L. Wang. 2012. The *Magnaporthe oryzae* effector AvrPiz-t targets the RING E3 ligase APIP6 for suppression of PAMP-triggered immunity in rice. *The Plant Cell* 24: 4748-4762
- Cruz, C. D., W. W. Bockus, J. P. Stack, X. Tang, **B. Valent**, K. F. Pedley and G. L. Peterson. 2012. Preliminary assessment of resistance among U.S. wheat cultivars to the Triticum pathotype of *Magnaporthe oryzae*. *Plant Disease* 96: 1501-1505
- Kour, A., K. Greer, **B. Valent**, M.J. Orbach and C. Soderlund. 2012. MGOS: Development of a community annotation database for *Magnaporthe oryzae*. *Molecular Plant-Microbe Interactions* 25: 271-278
- Chuma, I., C. Isobe, Y. Hotta, K. Ibaragi, N. Futamata, M. Kusaba, K. Yoshida, R. Terauchi, Y. Fujita, H. Nakayashiki, **B. Valent**, and Y. Tosa. 2011. Multiple Translocation of the AVR-Pita Effector Gene among Chromosomes of the Rice Blast Fungus *Magnaporthe oryzae* and Related Species, *PLoS Pathogens* 7(7): e1002147. doi:10.1371/journal.ppat.1002147
- Khang, C.H., R. Berruyer, M.C. Giraldo, P. Kankanala, S.-Y. Park, K. Czymmek, S. Kang and **B. Valent**, 2010. Translocation of *Magnaporthe oryzae* effectors into rice cells and their subsequent cell-to-cell movement. *The Plant Cell*, 22:1388-1403. (*Highlighted in Nature Reviews Microbiology* 8: 466-467, 2010, and in *The Plant Cell* 22: 996, 2010; *Rated "F1000 Biology Factor 6, Must Read"*)
- Valent, B.** and C.H. Khang. 2010. Recent advances in rice blast effector research. *Current Opinion in Plant Biology* 13: 434-441. (*Featured on the cover of the journal*)
- Mosquera, G., M.C. Giraldo, C.H. Khang, S. Coughlan, and **B. Valent**. 2009. Interaction transcriptome analysis identifies *Magnaporthe oryzae* BAS1-4 as biotrophy-associated secreted proteins in rice blast disease. *The Plant Cell*, 21:1273-1290. (*Rated F1000 Biology Factor 6, Must Read*)

- Yi, M., M.-H. Chi, C.H. Khang, S.-Y. Park, S., Kang, **B. Valent** and Y.-H. Lee. 2009. The ER chaperone LHS1 is involved in asexual development and rice infection by the blast fungus *Magnaporthe oryzae*. *The Plant Cell*, 21:681-695. (*Highlighted in The Plant Cell 21:366, 2009*)
- Khang, C.-H., S.-Y. Park, Y.-H. Lee, **B. Valent** and S. Kang. 2008. Genome organization and evolution of the *AVR-Pita* avirulence gene family in the *Magnaporthe grisea* species complex. *Molecular Plant-Microbe Interactions*, 21:658-670.
- Wang, Z., Lin, H., **Valent, B.**, Rutger, J.N. and Jia, Y. 2007. Cytological and molecular analyses of disease resistance to the rice blast fungus. *Chinese J. of Rice Sci.* 21: 335-340. (In Chinese, English abstract, English version of manuscript published by this journal in November). 2007.
- Kankanala, P, K. Czymmek and **B. Valent**, 2007. Roles for rice membrane dynamics and plasmodesmata during biotrophic invasion by the blast fungus. *The Plant Cell*, 19:706-724. (*Rated F1000 Biology Factor 6, Must Read*)
- Berruyer, R., S. Poussier, P. Kankanala, G. Mosquera, and **B. Valent**. 2006. Quantitative and qualitative influence of inoculation methods on *in planta* growth of rice blast fungus. *Phytopathology*, 96:346-355.
- Couch, B.C., I. Fudal, M.-H. Lebrun, D. Tharreau, **B. Valent**, P. van Kim, J.L. Notteghem, and L.M. Kohn. 2005. Origins of host-specific populations of the blast pathogen, *Magnaporthe oryzae*, in crop domestication with subsequent expansion of pandemic clones on rice and weeds of rice. *Genetics* 170:613-630.
- Jia, Y., G.T. Bryan, L. Farrall, and **B. Valent**. 2003. Natural variation at the *Pi-ta* rice blast resistance locus. *Phytopathology* 93: 1452-1459.
- Jia, Y., **B. Valent**, and F.N. Lee. 2003. Determination of host responses to *Magnaporthe grisea* on detached rice leaves using a spot inoculation method. *Plant Disease* 87: 129-133.
- Liao, D.-I., J. E. Thompson, S. Fahnestock, **B. Valent** and D. B. Jordan. 2001. A structural account of substrate and inhibitor specificity differences between two naphthol reductases. *Biochemistry*, 40:8696-8704.
- Kang, S., M. H. Lebrun, L. Farrall and **B. Valent**. 2001. Spontaneous gain of virulence by insertion of MGR586, an inverted repeat transposon in the rice blast fungus. *Molecular Plant-Microbe Interactions*, 14:671-674.
- Liao, D.-I., G. S. Basarab, A. A. Gatenby, **B. Valent** and D. B. Jordan. 2001. Structures of trihydroxynaphthalene reductase-fungicide complexes: implications for structure-based design, an active-site water molecule, and substrate specificity. *Structure*, 9:19-27.
- Thompson, J. E., S. Fahnestock, L. Farrall, D.-I. Liao, **B. Valent** and D. B. Jordan. 2000. The second naphthol reductase of fungal melanin biosynthesis in *Magnaporthe grisea*, tetrahydroxynaphthalene reductase. *The Journal of Biological Chemistry*, 275:34867-34872.
- Orbach, M. J., L. Farrall, J. A. Sweigard, F. G. Chumley and **B. Valent**. 2000. A telomeric avirulence gene determines efficacy of the rice blast resistance gene *Pi-ta*. *The Plant Cell*, 12:2019-2032.

Bryan, G. T., K.-S. Wu, L. Farrall, Y. Jia, H. P. Hershey, S. A. McAdams, K. N. Faulk, G. K. Donaldson, R. Tarchini, and **B. Valent**. 2000. A single amino acid difference distinguishes resistant and susceptible alleles of the rice blast resistance gene *Pi-ta*. *The Plant Cell*, 12:2033-2046.

Jia, Y., S. A. McAdams, G. T. Bryan, H. P. Hershey and **B. Valent**. 2000. Direct Interaction of resistance gene and avirulence gene products confers rice blast resistance. *The EMBO Journal*, 19:4004-4014.

### Non-Refereed Articles, Chapters, Books (since 2000)

Bockus, W. W., C. C. Cruz, J. P. Stack and **B. Valent**. 2015. Effect of seed-treatment fungicides on sporulation of *Magnaporthe oryzae* from wheat seed, 2014. (online) *Plant Disease Management Reports* 9:ST0004. DOI:10.1094/PDMR09. The American Phytopathological Society, St. Paul, MN.

**Valent, B.**, W.W. Bockus, C. D. Cruz, J. P. Stack, M. L. Farman, D. Hershman, P. Paul, G. L. Peterson, K. F. Pedley, and R. Magarey. 2013. Recovery plan for wheat blast caused by the *Magnaporthe oryzae* Triticum pathotype. National Plant Disease Recovery System (<http://www.ars.usda.gov/research/docs.htm?docid=14271> ). 1-33 pp.

Bockus, W. W., C. C. Cruz, B. Kalia, B. S. Gill, J. P. Stack, K.F. Pedley, G.L. Peterson and **B. Valent**, 2012. Reaction of selected accessions of *Aegilops tauschii* to wheat blast, 2011. (online) *Plant Disease Management Reports* 6:CF005. DOI:10.1094/PDMR06. The American Phytopathological Society, St. Paul, MN.

**Valent, B.**, C.H. Khang, M.C. Giraldo, M. Yi and M. Dalby. 2011. Towards understanding effector secretion, translocation and cell-to-cell trafficking during biotrophic invasion by the rice blast fungus. In: *Proceedings of the US-Japan Seminar on Genome-Enabled Integration of Research in Plant-Pathogen Systems*. (T. Wolpert, T. Shiraishi, eds.) APS Press, St. Paul, Minnesota, pp 81-92. (*Featured on the cover of the book*)

**Valent, B.**, C.H. Khang, M.C. Giraldo, M. Yi and M. Dalby. 2011. Towards understanding effector secretion, translocation and cell-to-cell trafficking during biotrophic invasion by the rice blast fungus. In: *Proceedings of the US-Japan Seminar on Genome-Enabled Integration of Research in Plant-Pathogen Systems*. (T. Wolpert, T. Shiraishi, eds.) APS Press, St. Paul, Minnesota, pp 81-92. (*Featured on the cover of the book*)

Khang, C.H. and **B. Valent**. 2010. *Magnaporthe oryzae*. In: *Cellular and Molecular Biology of Filamentous Fungi*. (edited by K.A. Borkovich and D.J. Ebbole) ASM Press. Washington D.C., pp 593-606.

Kankanala, P., G. Mosquera, C.H. Khang, G. Valdovinos-Ponce and **B. Valent**. 2009. Cellular and molecular analyses of biotrophic invasion by the rice blast fungus. In: *Advances in Genetics, Genomics and Control of Rice Blast Disease*. (edited by G.L. Wang and B. Valent) Springer Science and Business Media, New York, New York, pp 83-91.

*Advances in Genetics, Genomics and Control of Rice Blast Disease*. 2009. Edited by G.L. Wang and **B. Valent**. Springer Science and Business Media, New York, New York. 464 pp.

- Jia, Y. and **B. Valent**. 2007. Blast Resistance in Rice: Functional analysis of the Pi-ta and AVR-Pita genes. IN: "RICE IMPROVEMENT IN THE GENOMIC ERA" Ed. Dr. Swapan Datta. Publisher: CRC Press, USA, pp 207-236.
- Jia, Y., Zhou, E., Winston, E., Singh, P., Correll, J., Lee, F.N., and **Valent, B.** 2006. Molecular co-evolution of the rice *Pi-ta* resistance gene and *Magnaporthe oryzae* avirulence gene *AVR-Pita*. In: Biology of Plant-Microbe Interactions, Vol. 5. Edited by F. Sanchez, C. Quinto, I.M. Lopez-Lara, and O. Geiger. 12<sup>th</sup> International Symposium on Plant-Microbe Interactions. IS-MPMI, St. Paul. pp. 325-339.
- Valent, B.** 2004. Underground Life for Rice Foe, Nature News and Views, 431:516-517.
- Valent, B.**, G. T. Bryan, Y. Jia, L. Farrall, S. A. McAdams, K. N. Faulk, and M. Levy. 2001. Enhancing deployment of rice blast resistance genes: Opportunities from cloning a resistance gene / avirulence gene pair. In Rice Genetics IV. Proceedings of the Fourth International Rice Genetics Symposium, G.S. Khush, ed. (IRRI: International Rice Research Institute, Manila, Philippines).
- Valent, B.**, G. T. Bryan, Y. Jia, L. Farrall, S. A. McAdams, K. N. Faulk and H. P. Hershey. 2001. Molecular interactions between the rice blast resistance gene *Pi-ta* and its corresponding avirulence gene. In "Delivery and Perception of Pathogen Signals in Plants". N. T. Keen, S. Mayama, J. E. Leach and S. Tsuyumu, ed. (APS Press, St Paul, Minnesota) pp. 174 – 183.
- Meyn, M.A., L. Farrall, F.G. Chumley, **B. Valent** and M.J. Orbach. 2000. LINEs and SINEs in *Magnaporthe grisea*. In: *Advances in Rice Blast Research* (Tharreau, D., Lebrun, M.H., Talbot, N.J., and Nottoghem, J.L., eds), p. 349. Dordrecht: Kluwer.
- Bryan, G. T., Y. Jia, L. Farrall, K.-S. Wu, H. P. Hershey, S. A. McAdams, K. N. Faulk, G. K. Donaldson, R. Tarchini and **B. Valent**. 2000. Molecular characterization of resistance gene/avirulence gene in the rice blast system. In the Proceedings of the 9<sup>th</sup> International Congress on Molecular Plant-Microbe Interactions. (edited by P.J.G.M. de Wit, T. Bisseling and W.J. Stiekema) Amsterdam, pp. 35-39.

### Patents:

- U.S. Patent 5,264,569. November 23, 1993 (CR8669A) – R.J. Howard, J.A. Sweigard, W.D. Hitz, F.G. Chumley, **B. Valent**, Purified Fungal Spore Tip Mucilage
- U.S. Patent 6,479,731. November 12, 2002 – **Barbara Valent**, Gregory T. Bryan, A *Pi-ta* Gene Conferring Fungal Disease Resistance to Plants
- U.S. Patent 6,743,969. June 1, 2004 – Gregory T. Bryan, **Barbara Valent**, Modification of a plant disease resistance gene specificity and method for engineering altered specificity