ADAM J. BOGDANOVE
June 2017

SYNOPSIS

Bogdanove's research centers on bacterial infection of plants, with a focus on the role of TAL effectors in diseases of rice and other crop plants caused by *Xanthomonas* spp. TAL effectors are transcription factors injected by the bacteria into the host cell. Their targets include genes that contribute to disease development and, in resistant host varieties, genes that block disease progression. Bogdanove discovered the modular mechanism by which TAL effectors recognize specific DNA sequences, established computational methods to predict TAL effector binding sites in complex genomes, and pioneered the use of TAL effectors as customizable DNA targeting tools for applications such as targeted gene regulation (dTALEs) and genome editing (TALENs). Current efforts focus on genotypic and functional diversity of TAL effectors and their targets to guide the development of broad-spectrum, durable disease resistance in crop plants, and the use of genome editing to rapidly mobilize disease resistance and other valuable traits into different crop varieties.

PROFESSIONAL PREPARATION

B.S.	Biology, *cum laude*, Yale University; 1987
Ph.D.	Plant Pathology, Cornell University; Steven V. Beer, advisor; 1997
Postdoc	Purdue University, Boyce Thompson Inst.; Gregory B. Martin, mentor; 1997-2000

ACADEMIC POSITIONS

2015-present	*Director of Graduate Studies*, Plant Pathology and Plant-Microbe Biology, Cornell University
2012-present	*Professor*, Plant Pathology and Plant Microbe Biology, Cornell University
2011-2012	*Professor*, Plant Pathology and Microbiology, Iowa State University
2008-2010	*Chair*, Interdepartmental Microbiology graduate program, Iowa State University
2006-2008	*Associate Chair*, Interdepartmental Microbiology graduate program, Iowa State University
2006-2011	*Associate Professor*, Plant Pathology, Iowa State University
2000-2006	*Assistant Professor*, Plant Pathology, Iowa State University
1997-2000	*Postdoctoral Research Associate*, Botany and Plant Pathology, Purdue University ('97-'98) and Boyce Thompson Institute for Plant Research ('98-'00)
1991-1994	*Graduate Research Assistant*, Plant Pathology, Cornell University,
1987-1991	*Instructor*, English as a Second Language, Japan

Graduate Field affiliations at Cornell: Computational Biology, Microbiology, Plant Biology, Plant Pathology and Plant-Microbe Biology

PROFESSIONAL SERVICE LEADERSHIP (extramural; see also PROFESSIONAL SERVICE)

2016-present	*Co*-coordinator, three week "Rice: Research to Production" course, International Rice Research Institute, Los Baños, the Philippines
2015-present	*Chair*, Council for Agricultural Science and Technology Task Force on Genome Editing in Agriculture
2015	*Co-Organizer*, 11th US-Japan Seminar on Plant-Pathogen Interactions, "Molecular contact points in host-pathogen co-evolution," Takamatsu, Japan
2014	*Organizing Committee*, National Agricultural Biotechnology Consortium, Symposium on Genome Editing and Agriculture, Ithaca, NY

2013 *Organizing Committee*, Gordon Research Conference on Chemical and Biological Terrorism Defense, Ventura, CA
2013 *Participant,* Thought Leaders Meeting, American Phytopathological Society
2011- present Associate Editor, Journal of General Plant Pathology
2010 *Co-Organizer*, special session of the 2010 American Phytopathological Society meeting, "Nature's Molecular Biologist: Xanthomonas and TAL Effector Function, Structure, and Diversity," Charlotte, NC
2009-2012 *Chair*, Scientific Advisory Panel, California Department of Food and Agriculture Pierce's Disease Control Program
2009-2012 *Scientific Advisor* on Agricultural Green Technology to the Rural Development Administration of the Republic of Korea
2009 *Organizer and Chair*, Xanthomonas Genomics 2009 (3rd International Conference on Xanthomonas Genomics), Pingree Park, CO, July 2009.
2006 *Co-organizer*, Xanthomonas oryzae Workshop, 4th International Rice Functional Genomics Meeting, Montpellier, France, October 2006.

PROFESSIONAL SOCIETY MEMBERSHIPS

- American Phytopathological Society
- American Society for Microbiology
- International Society for Molecular Plant-Microbe Interactions

AWARDS AND HONORS

2016 Noel T. Keen Award for Research Excellence in Molecular Plant Pathology, American Phytopathological Society
2015 Outstanding Accomplishments in Research Award, College of Agriculture and Life Sciences, Cornell University
2012 *Science* magazine names TALENs runner up scientific breakthrough of the year
2010 *Nature Methods* names genome editing with engineered nucleases "Method of the Year"
2009 Honorary Senior Researcher, Rural Development Administration, Republic of Korea
2007 Recognition, support of outstanding student achievement, Iowa State University
1997 USDA-NRI Postdoctoral Research Fellowship
1996 NSF/Japan Ministry of Education Young Researchers Summer Program Fellowship.
1991 USDA National Needs Graduate Research Fellowship
1982 Eagle Scout

FUNDING (extramural, last 4 years; PI unless otherwise stated)

NSF Plant Genome Research Program IOS-1444511 (2015-2019) Quantitative trait locus editing for crop improvement. Co-PIs E. Doyle (Doane College), J. Leach (Colorado State), S. McCouch (Cornell), D. Voytas (U. Minnesota).

NSF Plant Genome Research Program IOS-1339348 (2014-2018) Targets of fungal effectors as keys to durable resistance in cereals. PI R. Wise (Iowa State); Co-PIs R. Innes (Indiana), F. Altpeter (U. Florida), D. Nettleton (Iowa State), A. Bogdanove (Cornell).

NYS Dept. of Health NYSTEM Program C029155 (2014-2018) Cornell Stem Cell and Modeling and Phenotyping Core. PI J. Schimenti, co-PIs A. Bogdanove, A. Nikitin, R. Williams W. Zipfel, (Cornell).

NSF Plant Genome Research Program DBI-1238189 (2012-2015) TAL effector targeting in plant genomes. PI F. White (Kansas State); co-PIs A. Bogdanove (Cornell), V. Brendel (Indiana), B. Yang (Iowa State).

Bayer Crop Sciences (2012-2015) TAL effector-driven amplification of gene expression in plants.

NIH (Therapeutic Approaches to Genetic Disease study section) R01GM098861 (2011-2015). DNA targeting by TAL effectors. Co-PIs D. Voytas (U. Minnesota), B. Stoddard (Fred Hutchinson Cancer Res. Ctr.).

NSF Plant Genome Research Program DBI 0922746 (2009-2013). GEPR: The functional interactome of cereals with the fungal biotroph, *Blumeria graminis*. PI R. Wise; Co-PIs A. Bogdanove, J. Dickerson, D. Nettleton, A. Lesham (Iowa State).

PUBLICATIONS See http://www.plantpath.cornell.edu/labs/bogdanove/pubs.html for updates and links.

Primary articles (refereed)

Cox, K.L., Meng, F., Wilkins, K.E., Li, F., Wang, P., Booher, N.J., Carpenter, S.C.D., Chen, L.Q., Zheng, H., Gao, X., Zheng, Y., Fei, Z., Yu, J.Z., Isakeit, T., Wheeler, T., Frommer, W.B., He, P., **Bogdanove, A.J.**, and Shan, L. (2017). TAL effector driven induction of a *SWEET* gene confers susceptibility to bacterial blight of cotton. Nat. Commun. 8, 15588.

Rinaldi, F.C.., Doyle, L.A., Stoddard, B.L., and **Bogdanove, A.J.** (2017). The effect of increasing numbers of repeats on TAL effector DNA binding specificity. Nucleic Acids Res. 1, doi: 10.1093/nar/gkx342.

Wang, L., Rinaldi, F.C., Singh, P., Doyle, E.L., Dubrow, Z.E., Tran, T.T., Perez-Quintero, A.L., Szurek, B., and **Bogdanove, A.J.** (2016) TAL effectors drive transcription bidirectionally in plants. Mol. Plant. 10. 285–296.

Read, A.C., Rinaldi, F., Hutin, M., He, Y., Triplett, L., and **Bogdanove, A.J.** (2016). Suppression of Xo1-mediated disease resistance in rice by a truncated, non-DNA-binding TAL effector of *Xanthomonas oryzae*. Front. Plant Sci. 7, article 1516.

Quibod, I.L., Perez-Quintero, A., Booher, N.J., Dossa, G.S., Grande, G., Szurek, B., Vera Cruz, C., Bogdanove, A.J., and Oliva, R. (2016). Effector diversification contributes to *Xanthomonas oryzae* pv. oryzae phenotypic adaptation in a semi-isolated environment. Sci. Rep. 6, 34137.

Triplett, L.R., Cohen, S.P., Heffelfinger, C., Schmidt, C.L., Huerta, A.I., Tekete, C., Verdier, V., **Bogdanove, A.J.**, and Leach, J.E. (2016). A resistance locus in the American heirloom rice variety Carolina Gold Select is triggered by TAL effectors with diverse predicted targets and is effective against African strains of *Xanthomonas oryzae* pv. oryzicola. Plant J. 87, 472-483.

Hummel, A. W., Wilkins, K. E., Wang, L., Cernadas, R. A. and **Bogdanove, A. J.** (2016) A transcription activator-like effector from *Xanthomonas oryzae* pv. oryzicola elicits dose-dependent resistance in rice. Mol. Plant Pathol.18:55-66

Booher, N.J., Carpenter, S.C.D., Sebra, R.P., Wang, L., Salzberg, S.L., Leach, J.E., and **Bogdanove, A.J.** (2015). Complete single molecule real time (SMRT) sequencing of *Xanthomonas oryzae* strains reveals dynamic genome structure and complex TAL effector gene relationships. Microbial Genomics 1: doi 10.1099/mgen.1090.000032.

Wilkins, K.E., Booher, N.J., Wang, L., and **Bogdanove, A.J.** (2015). TAL effectors and activation of predicted host targets distinguish Asian from African strains of the rice pathogen *Xanthomonas oryzae* pv. oryzicola while strict conservation suggests universal importance of five TAL effectors. Front. Plant Sci. 6:536.

Whigham, E., Qi, S., Mistry, D., Surana, P., Xu, R., Fuerst, G.S., Pliego, C., Bindschedler, L.V., Spanu, P., Dickerson, J.A., Innes, R., Nettleton, D., **Bogdanove, A.J.**, and Wise, R.P. (2015). Broadly conserved fungal effector BEC1019 suppresses host cell death and enhances pathogen virulence in powdery mildew of barley (Hordeum vulgare L.). Molecular Plant-Microbe Interactions 28:968-983.

Lu, X., Hershey, D.M., Wang, L., **Bogdanove, A.J.**, and Peters, R.J. (2014). An ent-kaurene-derived diterpenoid virulence factor from *Xanthomonas oryzae* pv. oryzicola. New Phytol. 206:295-30.

Kleinstiver, B.P., Wang, L., Wolfs, J.A., Kolaczyk, T., McDowell, B., Wang, X., Schild-Poulter, C., Bogdanove, A.J., and Edgell, D.R. (2014). The I-TevI nuclease and linker domains contribute to the specificity of monomeric TALENs. G3: Genes|Genomes|Genetics 4:1155-1165.

Cernadas, R.A., Doyle, E.L., Nino-Liu, D.O., Wilkins, K.E., Bancroft, T., Wang, L., Schmidt, C.L., Yang, B., White, F.F., Nettleton, D., Wise, R.P., and **Bogdanove, A.J.** (2014) Code-assisted discovery of TAL effector targets in bacterial leaf streak of rice reveals contrast with bacterial blight and a novel susceptibility gene. PLOS Pathogens 10: e1003972.

Doyle E.L., Hummel, A.W., Demorest Z.L., Starker .C.G, Voytas D.F., Bradley P., and **Bogdanove A.J.** (2013) TAL effector specificity for base 0 of the DNA target is altered in a complex, effector- and assay-dependent manner by substitutions for the tryptophan in cryptic repeat -1. PLOS ONE 2013, 8:e82120.

Wang H., Hu Y.-C., Markoulaki S., Welstead G.G., Cheng A.W., Shivalila, C.S., Pyntikova, T., Dadon, D.B., Voytas, D.F., **Bogdanove, A.J.**, Page, D.C., and Jaenisch, R. (2013) TALEN-mediated editing of the mouse Y chromosome. Nat. Biotech. 31, 530–532.

Pogorelko, G., Lionetti, V., Fursova, O., Sundaram, R.M., Qi, M., Whitham, S.A., **Bogdanove, A.J.**, Bellincampi, D., and Zabotina, O.A. (2013) Arabidopsis and Brachypodium transgenic plants expressing *A. Nidulans* acetylesterases have decreased degree of polysaccharide acetylation and increased resistance to pathogens. Plant Physiology 162:19-23.

Pliego, C., Nowara, D., Bonciani, G., Gheorghe, D.M., Xu, R., Surana, P., Whigham, E., Nettleton, D., **Bogdanove, A.J.**, Wise, R.P., Schweizer, P., Bindschedler, L.V., and Spanu, P.D. (2013) Host-Induced Gene Silencing in barley powdery mildew reveals a class of ribonuclease-like effectors.Mol. Plant-Microbe Interact. 26:633-642.

Wang, L., Vinogradov, E., and **Bogdanove, A.J.** (2013) Requirement of the lipopolysaccharide O-chain biosynthesis gene wxocB for type III secretion and virulence of *Xanthomonas oryzae* pv. oryzicola. J. Bacteriol.195:1959-1969.

Zhang, Y., Zhang, F., Li, X., Baller, J.A., Qi, Y., Starker, C.G., **Bogdanove, A.J.**, Voytas, D.F. (2012) TALENs enable efficient plant genome engineering. Plant Physiology 161:20-27

Verdier, V., Triplett, L.R., Hummel, A.W., Corral, R., Cernadas, R.A., Schmidt, C.L., **Bogdanove, A.J**., and Leach, J.E. (2012). Transcription activator-like (TAL) effectors targeting *OsSWEET* genes enhance virulence on diverse rice (*Oryza sativa*) varieties when expressed individually in a TAL effector-deficient strain of *Xanthomonas oryzae*. New Phytologist 196, 1197-1207.

Christian, M.L., Demorest, Z.L., Starker, C.G., Osborn, M.J., Nyquist, M.D., Zhang, Y., Carlson, D.F., Bradley, P., **Bogdanove, A.J**. and Voytas, D.F. (2012) Targeting G with TAL effectors: a comparison of activities of TALENs constructed with NN and NK repeat variable di-residues. PLoS ONE, 7, e45383.

Doyle, E.L., Booher, N.J., Standage, D.S., Voytas, D.F., Brendel, V.P., Vandyk, J.K., and **Bogdanove, A.J.** (2012) TAL Effector-Nucleotide Targeter (TALE-NT) 2.0: tools for TAL effector design and target prediction. Nucl. Acids Res. 40(W1): W11-W122.

Hummel, A.W., Doyle, E.L., and **Bogdanove, A.J.** (2012) Addition of TAL effector binding sites to a pathogen strain-specific rice bacterial blight resistance gene makes it effective against additional strains and against bacterial leaf streak. New Phytologist 195: 883-893.

Mak, A.S., Bradley, P., Cernadas, R. A., **Bogdanove, A.J.**, and Stoddard, B.S. (2012) The crystal structure of TAL effector PthXo1 bound to its DNA target. Science 335:716-9.

Bogdanove, A.J., Koebnik, R., Lu, H., Furutani, A., Angiuoli, S.V. *et al.* (2011) Two new complete genome sequences offer insight into host and tissue specificity of plant pathogenic *Xanthomonas spp*. J. Bacteriol. 193: 5450-5464.

Cermak, T., Doyle, E.L., Christian, M., Wang, L., Zhang, Y., Schmidt, C., Baller, J.A., Somia, N.V., **Bogdanove, A.J.***, and Voytas, D.F. (2011) Efficient design and assembly of custom

TALEN and other TAL effector-based constructs for DNA targeting. Nucleic Acids Res. 39:e82. * co-corresponding author.
Christian, M., Cermak, T., Doyle, E.,L., Schmidt, C., Zhang, F., **Bogdanove, A.J.**, and Voytas, D. (2010) Targeting DNA double-strand breaks with TAL effector nucleases. Genetics 186, 757-761.
Moscou, M. J., and **Bogdanove, A.J.** (2009). A simple cipher governs TAL effector-DNA recognition. Science 326:1501. *Journal impact factor, **29.7**. Citations to date, **28**.*
Lu, H., Patil, P., Van Sluys, M.-A., White, F.F., Ryan, R.P., Dow, J.M., Rabinowicz, P., Salzberg, S.L., Leach, J.E., Sonti, R., Brendel, V., and **Bogdanove, A.J.** (2008). Acquisition and evolution of plant pathogenesis-associated gene clusters and candidate determinants of tissue-specificity in *Xanthomonas*. PLoS ONE 3:e3828.
Seo, Y.-S., Sriariyanun, M., Wang, L., Pfeiff, J., Phetsom, J., Lin, Y., Jung, K.-H., Chou, H.-H., **Bogdanove, A.J.**, and Ronald, P.C. (2008). A two-genome microarray for the rice pathogens *Xanthomonas oryzae* pv. oryzae and *X. oryzae* pv. oryzicola and its use in the discovery of a difference in their regulation of *hrp* genes. BMC Microbiology 8:99.
Salzberg, S.L., Sommer, D.D., Schatz, M.C., Phillippy, A.M., Rabinowicz, P.D., Tsuge, S., Furutani, A., Ochiai, H., Delcher, A.L., Kelley, D., Madupu, R., Puiu, D., Radune, D., Shumway, M., Trapnell, C., Aparna, G., Jha, G., Pandey, A., Patil, P.B., Ishihara, H., Meyer, D.F., Szurek, B., Verdier, V., Koebnik, R., Dow, J.M., Ryan, R.P., Hirata, H., Tsuyumu, S., Lee, S.W., Ronald, P.C., Sonti, R.V., Van Sluys, M.-A., Leach, J.E., White, F.F., and **Bogdanove, A.J.** (2008). Genome sequence and rapid evolution of the rice pathogen *Xanthomonas oryzae* pv. oryzae PXO99A. BMC Genomics 9:204.
Patil, P.B., **Bogdanove, A.J.,** and Sonti, R.V. (2007) The role of horizontal transfer in the evolution of a highly variable lipopolysaccharide biosynthesis locus in xanthomonads that infect rice, citrus and crucifers. BMC Evolutionary Biology 7:243.
Wang, L. Makino, S., Subedee, A. and **Bogdanove, A.J.** (2007) Novel candidate virulence factors in rice pathogen *Xanthomonas oryzae* pv. oryzicola revealed by mutational analysis. Applied and Environmental Microbiology 73:8023-8027).
Nissinen, R.M., Ytterberg, A.J., **Bogdanove, A.J.,** van Wijk, J.K., and Beer, S.V. (2007) Analyses of the secretomes of *Erwinia amylovora* and selected *hrp* mutants reveal novel type III secreted proteins and an effect of HrpJ on extracellular harpin levels. Molecular Plant Pathology 8:55-67.
Wang, L., Eggenberger, A.L., Hill, J., and **Bogdanove, A.J.** (2006). *Pseudomonas syringae* effector *avrB* confers soybean cultivar-specific avirulence on *Soybean mosaic virus* adapted for transgene expression but effector *avrPto* does not. Molecular Plant-Microbe Interactions 19:304-312.
Makino, S., Sugio, A., White, F.F., and **Bogdanove, A.J.** (2006). Inhibition of resistance gene mediated defense in rice by *Xanthomonas oryzae* pv. *oryzicola*. Molecular Plant-Microbe Interactions 19:240-249.
Nino-Liu, D.O., Darnielle, L., and **Bogdanove, A.J.** (2005). A simple method of mass inoculation of rice effective for both pathovars of *Xanthomonas oryzae*, and the construction of comparable sets of host cDNA libraries spanning early stages of bacterial leaf blight and bacterial leaf streak. Journal of Phytopathology 153: 500-504.
Bogdanove, A.J. and Martin, G.B. (2000). AvrPto-dependent Pto-interacting proteins and AvrPto-interacting proteins in tomato. Proceedings of the National Academy of Sciences 97: 8836-8840.
Bogdanove, A.J., Bauer, D.W., and Beer, S.V. (1998). *Erwinia amylovora* secretes DspE, a pathogenicity factor and functional AvrE homolog, through the Hrp (type III secretion) pathway. Journal of Bacteriology180:2244-2247.
Bogdanove, A.J., Kim, J.F., Wei Z.-M., Kolchinsky, P., Charkowski, A.O., Conlin, A.K., Collmer, A., and Beer, S.V. (1998). Homology and functional similarity of an *hrp*-linked pathogenicity

locus, *dspEF*, of *Erwinia amylovora* and the avirulence locus *avrE* of *Pseudomonas syringae* pathovar tomato. Proceedings of the National Academy of Sciences 95: 1325-1330.

Bogdanove, A.J., Beer, S.V., Bonas, U., Boucher, C.A., Collmer, A., Coplin, D.L., Cornelis, G.R., Huang, H.-C., Hutcheson, S.W., Panopoulos, N.J., and Van Gijsegem, F. (1996). Unified nomenclature for broadly conserved *hrp* genes of phytopathogenic bacteria. Molecular Microbiology 20:681-683.

Bogdanove, A.J., Wei, Z.-M., Zhao, L., and Beer, S.V. (1996). *Erwinia amylovora* secretes harpin via a Type III pathway and contains a homolog of *yopN* of *Yersinia spp.* Journal of Bacteriology 178:1720-1730.

Bauer, D.W., **Bogdanove, A.J.**, Beer, S.V., and Collmer. A. (1994). *Erwinia chrysanthemi hrp* genes and their involvement in soft rot pathogenesis and elicitation of the hypersensitive response. Molecular Plant-Microbe Interactions 7:573-581.

Review articles and book chapters (refereed)

Bogdanove, A.J., and Booher, N.J. (2016). Online tools for TALEN design. In TALENs: Methods and Protocols, R. Kühn, W. Wurst, and B. Wefers, eds (New York, Heidelberg, Dordrecht, London: Humana Press (Springer)), pp. 43-47.

Booher, N.J. and **Bogdanove, A.J.** (2014) Tools for TAL effector design and target prediction. Methods 69:121-127.

Bogdanove, A.J. (2014) Principles and applications of TAL effectors for plant physiology and metabolism. Curr. Opin. Plant Biol. 19, 99-104.

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Mak, A.N.-S., Bradley, P., **Bogdanove, A.J.**, and Stoddard, B.L. (2012) TAL effectors: function, structure, engineering and applications. Curr. Opin. Struct. Biol. 23: 93 - 99.

Bogdanove, A.J. and Voytas, D.F. (2011). TAL effectors: customizable proteins for DNA targeting. Science 333:1843-1846.

Ryan, R.P., Vorhölter, F.-J., Potnis, N., Jones, J.B., Van Sluys, M.-A., **Bogdanove, A.J.**, and Dow, J.M. (2011). Pathogenomics of *Xanthomonas*: understanding bacterial–plant interactions. Nat. Rev. Microbiol. 9:344-355.

Bogdanove, A.J., Schornack, S. and Lahaye, T. (2010). TAL effectors: finding plant genes for disease and defense. Curr. Opin. Plant Biol.13:394-401.

Ryan, R.P., Koebnik, R., Szurek, B., Boureau, T., Bernal, A., **Bogdanove, A.J.**, and Dow, J.M. (2009). Passing GO (gene ontology) in plant pathogen biology: a report from the Xanthomonas Genomics Conference. Cell. Microbiol. 11:1689-1696.

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Martin, G.B., **Bogdanove, A.J.**, Sessa, G. (2003). Understanding the functions of plant disease resistance proteins. Annual Review of Plant Biology 54: 23-61.

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Conference proceedings, non-refereed book chapters, and published abstracts

Bogdanove, A.J., and Booher, N.J. (2016). Online Tools for TALEN Design. In TALENs: Methods and Protocols, R. Kühn, W. Wurst, and B. Wefers, eds (New York, Heidelberg, Dordrecht, London: Humana Press (Springer)), pp. 43-47.

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Wang, L., Leach, J.E., and **Bogdanove, A.J.** (2006) Genetic background of *Xanthomonas oryzae* pv. oryzae strains influences the function of specific avirulence genes. Phytopathology 96, S121.

Wang, L., Mahama, A., Darnielle, L., Eggenberger, A., Hill, J., and **Bogdanove, A.J.** (2005). Recognition of the bacterial effector protein AvrPto in soybean – a case of HR-independent resistance?, pp. 103-114 *in* Genomic and Genetic Analysis of Plant Parasitism and Defense: Proceedings of the 9th Japan-US Seminar on Plant-Pathogen Interactions, Shizuoka, Japan, November 1-7, 2003. Tsuyumu, S., Leach, J., Shiraishi, T., and Wolpert, T. (eds), APS Press, St. Paul.

Devarenne, T.P., Riely, B.K., Lin, N.-C., Kim, Y.-J., Cohn, J., Mysore, K., Charkravarthy, S., **Bogdanove, A.J.**, D'Ascenzo, M., Debbie, P., Tuori, B., Martin, G.B. (2002). Recognition of *Pseudomonas* effector proteins by tomato and profiling of plant gene expression changes that occur during plant-pathogen interactions, pp. 58-63 *in* Biology of Plant-Microbe Interactions, Vol. 3: Proceedings of the 10th International Symposium on Molecular Plant-

Microbe Interactions, Madison, Wisconsin, USA, July 10-14, 2001, Leong, S. A., Allen, C., and Triplett, E. W. (eds), International Society for Molecular Plant-Microbe Interactions, St. Paul. 10%, 10%, 0%.

Bogdanove, A.J., Gu, Y.-Q., Nakajima, Y. , Sessa, G., and Martin, G.B. (1999). Early events in AvrPto/Pto-mediated activation of defense responses, pp. 238-242 *in* Biology of Plant-Microbe Interactions: Proceedings of the 9th International Symposium on Molecular Plant-Microbe Interactions, Amsterdam, The Netherlands, July 25-30, 1999, de Wit, J. G. M., Bisseling, T., and Stiekema, W. J. (eds). International Society for Molecular Plant-Microbe Interactions, St. Paul.

Bauer, D.W., Zumoff, C.H., Theisen, T.M., **Bogdanove, A.J.**, and Beer, S.V. (1997) Optimized production of Erwinia amylovora harpin and its use to control plant disease and enhance plant growth. Phytopathology 87, S7. 0%, 15%, 15%.

Bogdanove, A.J., Kim, J.F., Wei, Z.M., Kolchinsky, P., Charkowski, A.O., Theisen, T.M., Collmer, A., and Beer, S.V. (1997) DspEF, a hrp-linked pathogenicity/avirulence operon of *Erwinia amylovora*. Phytopathology 87, S10.

Kim, J.F., **Bogdanove, A.J.**, Bauer, D.W., Wei, Z.M., and Beer, S.V. (1997) Hrp-secreted proteins and avirulence protein homologs of *Erwinia amylovora*. Phytopathology 87, S52. 20%, 20%, 5%.

Bogdanove, A.J., Wei, Z.-M., Zhao, L.P., and Beer, S.V. (1995) Harpin is exported via the type III secretion pathway. Phytopathology 85, 1159.

Letters and white papers

Tremblay, J.P., Xiao, X., Aartsma-Rus, A., Barbas, C., Blau, H.M., **Bogdanove, A.J**., Boycott, K., Braun, S., Breakefield, X.O., Bueren, J.A., Buschmann, M., Byrne, B.J., Calos, M., Cathomen, T., Chamberlain, J., Chuah, M., Cornetta, K., Davies, K.E., Dickson, J.G., Duchateau, P., Flotte, T.R., Gaudet, D., Gersbach, C.A., Gilbert, R., Glorioso, J., Herzog, R.W., High, K.A., Huang, W., Huard, J., Joung, J.K., Liu, D., Liu, D., Lochmuller, H., Lustig, L., Martens, J., Massie, B., Mavilio, F., Mendell, J.R., Nathwani, A., Ponder, K., Porteus, M., Puymirat, J., Samulski, J., Takeda, S.i., Thrasher, A., VandenDriessche, T., Wei, Y., Wilson, J.M., Wilton, S.D., Wolfe, J.H., and Gao, G. (2013). Translating the genomics revolution: the need for an international gene therapy consortium for monogenic diseases. Mol. Ther. 21, 266-268.

Arlat, M., Becker, A., Bogdanove, A.J., Koebnik, R., Leach, J., Mudgett, M.B., Ryan, R., Szurek, B., and White, F. (2009). Priorities for the Xanthomonas research community - a white paper summarizing discussions held on July 15, 2009 at the Xanthomonas Genomics Conference at Pingree Park, CO. Distributed to USDA and NSF funding program managers and through the American Phytopathological Society and the International Society for Plant Microbe Interactions. www.public.iastate.edu/~ajbog/shared/xgc2009whitepaper.pdf.

Bogdanove, A.J., Beer, S.V., Bonas, U., Boucher, C.A., Collmer, A., Coplin, D.L., Cornelis, G.R., Huang, H.-C., Hutcheson, S.W., Panopoulos, N.J., and Van Gijsegem, F. (1996) Unified nomenclature for broadly conserved hrp genes of phytopathogenic bacteria. Mol. Microbiol 20:681-683.

Websites and web-based resources

Einarson, S., Hautea, S., Knight, C., Doyle, E.L., Leach, J.E., McCouch, S., Voytas, D., and **Bogdanove, A.J.** (2015 onward). Crop QTL Editing at https://cropqtlediting.cals.cornell.edu/.

Doyle E.L., Booher, N.J., Standage, D.S., Voytas, D.F., Brendel, V.P., VanDyk, J.K., **Bogdanove, A.J.** (2010 onward). TAL Effector-Nucleotide Targeter at https://boglab.plp.iastate.edu/.

Venkatagiri, S., Minion, F.C., Beattie, G.A., Beavers, G., Cunnick, J., Dennis, D., and **Bogdanove, A.J**. (2010-2012). "Iowa State University Interdepartmental Microbiology Graduate Program" at www.micrograd.iastate.edu.

Bogdanove, A.J., and Dennis, D. (2009). "*Xanthomonas* Genomics Conference 2009" at www.plantpath.iastate.edu/xgc2009.

Darnielle, L., Vogel, K., and **Bogdanove, A.J.** (2002-2012). "Functional genomics of rice susceptibility to bacterial pathogens" at http://www.public.iastate.edu/~ajbog/nsf/.

Vogel, K., Darnielle, L., Booher, N.J., and **Bogdanove, A.J.** (2001 onward). "Bogdanove laboratory" at http://www.plantpath.cornell.edu/labs/bogdanove/

INVITED PRESENTATIONS (extramural since 2000; asterisk denotes international venue)

2016-Nov	Department of Plant Pathology & Microbiology, Texas A&M University, College Station, TX.
2016-Oct*	Fifth International Conference on Bacterial Blight, Manila, The Philippines.
2016-Aug*	International Rice Research Institute, Los Baños, The Philippines.
2016-Aug*	Department of Plant Pathology, Kasetstart University, Bangkok, Thailand.
2015-Oct*	11th Japan-US Seminar on Plant-Pathogen Interactions "Molecular contact points in host-pathogen co-evolution," Takamatsu, Japan.
2015-Oct*	Plant Genomics Congress "Utilizing NGS, -omic and gene editing technologies to progress plant research, St. Louis, MO.
2015-Jul*	Xanthomonas Genomics Conference, Bogota, Colombia.
2015-Apr	Center for Genome Research and Biocomputing, Oregon State University, Corvallis, OR.
2015-Apr*	Crop Bioengineering Consortium Symposium, Iowa State University, Ames, IA.
2014-Dec	Plant Breeding, Genetics and Biotechnology symposium, Michigan State University, E. Lansing, MI.
2014-Nov*	12th International Symposium for Rice Functional Genomics, Tucson AZ.
2014-Nov	Boyce Thompson Institute for Plant Research, Ithaca NY.
2014-Oct	Cibus, San Diego, CA.
2014-Oct	National Agricultural Biotechnology Consortium, Symposium on Genome Editing and Agriculture, Ithaca, NY.
2014-Mar*	Dept. of Plant Pathology, Kasetsart University, Bangkok, Thailand.
2013-Dec*	International Conference on Bacterial Blight, Hyderabad, India.
2013-Nov	The Huck Institutes of Life Sciences and the Dept. of Plant Pathology, Penn State University, University Park, PA.
2013-Nov	Crop Bioengineering Consortium symposium, Iowa State University, Ames, IA.
2013-Oct*	Kagawa University, Plant Science Symposium, Takamatsu Japan.
2013-Oct*	Brazilian Congress of Plant Pathology, Ouro Preto, MG, Brazil.
2013-Aug*	American Phytopathological Society Annual Meeting, Austin, TX.
2013-Mar	Gordon Research Conference on Chemical and Biological Terrorism Defense, Ventura, CA.
2012-Dec*	25th anniversary symposium "Biology and Beyond," Centre for Cellular and Molecular Biology, Hyderabad, India.
2012-Dec*	International Conference on Plant Health Management for Food Security, Crop Protection Association of India, Directorate of Rice Research, Hyderabad, India.
2012-Nov	Department of Genetics, Washington University of St. Louis, St. Louis, MO.
2012-Sep*	30th New Phytologist Symposium, Immunomodulation by Plant-Associated Microorganisms, Fallen Leaf, CA.
2012 Sep*	FASEB Conference, Genome Engineering: Research and Applications, Lucca, Italy.

2012-Jul* XVth International Congress on Molecular Plant-Microbe Interactions, Kyoto, Japan.
2012-May University of Georgia Plant Center Spring Symposium, Athens, GA.
2012-Mar* Dept. Biochemistry, Western Ontario University.
2012-Feb* US-Israel BARD workshop on Plant Immunity, Tel Aviv.
2011-Oct Fred Hutchinson Cancer Research Center, Seattle, WA.
2011-Sep* Effectome Conference, Lauret, France.
2011-Aug FBI Regional Biosecurity Workshop, Iowa State University.
2011-May* American Society of Cell and Gene Therapy 2011 Annual Meeting, Seattle, WA.
2011-May Bayer Crop Sciences.
2011-Apr Department of Plant Pathology, Michigan State University.
2011-Mar Gordon Research Conference on Chemical and Biological Terrorism Defense, Ventura, CA.
2011-Feb Department of Plant Pathology and Plant Microbe Biology, Cornell University.
2011-Jan Workshop on Rice Diseases, Plant and Animal Genome XIX Conference.
2010-Nov Plant Biology Symposium, University of Minnesota.
2010-Oct Department of Plant Pathology, North Carolina State University.
2010-Oct* 3rd International Congress on Bacterial Blight, Seoul Korea.
2010-Aug* 2010 APS (American Phytopathological Society) Annual Meeting, Charlotte, NC.
2010-Jun* FASEB Conference on Genome Engineering, Steamboat Springs, CO.
2010-Feb Department of Plant Pathology, University of Nebraska, Lincoln.
2010-Jan* 10th Japan-US Seminar: Genome-Enabled Integration of Research in Plant Pathogen Systems, Oregon State University.
2009-May* Martin Luther University Halle-Wittenberg, Institute for Genetics.
2009-Jan Paso Robles Vintners Association, Paso Robles, CA.
2008-Nov Dept. of Plant Pathology, UC Davis.
2007-Oct* Prokagenome 2007: 3rd European Conference on Prokaryotic Genomics, Goettingen, Germany.
2007-Sep University of Wisconsin, Madison, Department of Plant Pathology.
2007-Sep* 2nd International Conference on Bacterial Blight of Rice, Nanjing, China.
2007-Jan NSF&USDA/CSREES Microbial Genome Sequencing Program Awardee Workshop, Plant and Animal Genome Conference, San Diego, CA.
2006-Oct* Xanthomonas oryzae Workshop at 4th International Rice Functional Genomics Meeting, Montpellier, France.
2005-Oct* 2nd International Workshop on Xanthomonas: Genomics, Bielefeld, Germany.
2005-Sep American Microbiology Society, 65th annual meeting of the North Central Branch, Ames, IA.
2004-Oct University of Minnesota, Department of Plant Pathology.
2004-Mar* 1st International Conference on Bacterial Blight of Rice, Tsukuba, Japan.
2003-Nov* 9th Japan-US Seminar on Plant-Pathogen Interactions: Genomic and Genetic Analysis of Plant Parasitism and Defense, Shizuoka, Japan.
2002-Feb Iowa Soybean Promotion Board Meeting, Ames, IA.
2000-Sep* 52nd Harden Conference, Signaling in Plants, Wye, Kent UK.

INTELLECTUAL PROPERTY CONTRIBUTIONS (U.S.)

Voytas, D.F., **Bogdanove, A.J.**, and Zhang, F. (2013-14) US patent nos. 8697853, 8586363, 8450471, 8440432, 8440431. TAL effector-mediated DNA modification.

Bogdanove, A.J., Kim, J.F., Wei, Z.-M., and Beer, S.V. (2005) US patent no. 6855683. Hypersensitive response elicitor from *Erwinia amylovora*, its use, and encoding gene.

Bauer, D.W., Beer, S.V., **Bogdanove, A.J.**, Collmer, A., and Ham, J.H. (2003) US patent no. 6596509. Recombinant constructs and systems for secretion of proteins via type III secretion systems.

Bogdanove, A.J., Kim, J.F., Wei, Z.-M., and Beer, S.V. (2001) US patent no. 6228644. Hypersensitive response elicitor from *Erwinia amylovora*, its use, and encoding gene.

TEACHING (last four years)

Courses

Cornell

2016- PLPPM4250, DNA targeting: applications, reagents, and impact

2014- PLBIO6410, Laboratory in Plant Molecular Biology, unit on Genome Editing

Advising and Mentoring

Master's and Doctoral students (*3 current, 14 total)*

Ph.D., current, Zoe Dubrow, Plant Pathology

Ph.D., current, Andrew Read, Plant Pathology

Ph.D., current, Morgan Carter, Plant Pathology and Plant-Microbe Biology

Ph.D., 2016, Katherine Wilkins, Computational Biology

Ph.D., withdrew 2015, Nicholas Booher, Computational Biology M.S., 2015, Shan Qi, Plant Pathology and Plant-Microbe Biology

Ph.D., 2013, Aaron Hummel, Molecular Cellular and Developmental Biology.

Ph.D., 2013, Erin Doyle, Bioinformatics and Computational Biology

Ph.D., withdrew 2010, Achala Jayasena, Plant Pathology

M.S., 2010, Karla Vogel, Interdepartmental Genetics. Co-advisor, P. Scott USDA. *Current position: Research and Data Coordinator, Monsanto Co.*

Ph.D., 2007, Li Wang, Molecular, Cellular, and Developmental Biology. *Subsequent position: Postdoctoral Researcher, Holling Cancer Center, Department of Biochemistry and Molecular Biology, Medical University of South Carolina. Current position:Assistant Scientist I, Iowa State University Dept. of Plant Pathology (my lab).*

M.S., 2005, Seiko Makino, Interdepartmental Genetics. *Graduate Research Excellence Awardee. Subsequent position: Research Associate, Massachusetts General Hospital. Current position: Ph.D. candidate, Cambridge University.*

M.S., 2005 Ling Chen, Interdepartmental Genetics. *Current position: Senior Laboratory Technician, Department of Pathology, Johns Hopkins University School of Medicine*

M.S., 2004, Junli Ji, Bioinformatics and Computational Biology and Interdepartmental Genetics. Co-advisor, Dr. Madan Bhattacharyya, Agronomy. *Subsequent position: Ph. D. candidate, Department of Plant Pathology, University of Wisconsin, Madison.*

Visiting students *(3 total)*

Lawan Kladsuwan, PhD candidate, Plant Pathology Kasetsart University, Bangkok, Thailand, 2015-2016

Nargues Falahi-Charkhabi, PhD candidate, Plant-Pathology, Tarbiat Modares University, Tehran, Iran, 2013-2015

Shan Tian, PhD candidate, Plant Pathology, Nanjing Aricultural University, PRC 2012-2013

Postdoctoral researchers and visiting scientists *(3 current, 13 total)*

Dr. Mathilde Hutin, 2016-present

Dr. Pallavi Singh, 2015-2016

Dr. Yong-Qiang He, Associate Professor, Quangxi University, China, 2015-2016

Dr. Stephen Mondo, 2014. *Subsequent position: Scientist, Joint Genome Institute*

Dr. Fabio Rinaldi, 2012-present

Dr. Gourisankar Laha, Senior Scientist, Directorate of Rice Research, India, as USDA Borlaug Fellow, 2011-2012
Dr. Sundaram, Senior Scientist, Directorate of Rice Research, India, as Indo-US Science and Technology Research Fellow, 2011-2012
Dr. Li Wang, 2009-present
Dr. R. Andres Cernadas, 2009-2014
Dr. Damien Meyer, 2007-2008. *Subsequent position: Research Scientist, CIRAD (French Agricultural Research Centre for International Development), Guadeloupe*
Dr. David Niño-Liu, 2004-2008, *Subsequent position: Research Associate, Assistant Breeder, Monsanto Canada, Inc.*
Dr. Rodica Mateescu, Lecturer and Scientist, Department of Systems Ecology and Sustainable Management of Natural and Man-dominated Ecological Systems, Polytechnic University of Bucharest, 2004, ISU-USDA-USAID Romania Young Scientist to Scientist Program. *One month research internship in my laboratory.*
Dr. Assibi Mahama, 2002-2004. Subsequent position: *Research Associate, Department of Agronomy, Iowa State University. Current position: Scientist, Pioneer Hybrid International.*

INSTITUTIONAL SERVICE (past 4 years)

CORNELL

Service to the University

2016- Genome Biology Task Force, Provost's Initiative for Radical Collaboration

Search committees

2016-2017 Director, School of Integrative Plant Science
2015-2017 Faculty position in quantitative genomics, Plant Breeding
2012-2013 Faculty position in PPPMB, Soil Microbiology

Service to the College of Agriculture and Life Sciences

2016- *Chair*, Faculty Advisory Committee to the Plant Transformation Facility
2014 Ad hoc committee on Strategic Hiring – areas of expertise
2014 Ad hoc advisory committee on implementation of the School of Plant Sciences

Service to the School of Integrative Plant Science

2015- Strategic Hiring committee
2015- Committee on Graduate Programs

Service to the Section of Plant Pathology and Plant-Microbe Biology

2014- Executive committee
2014- Mentoring committee (Assist. Prof.)

Service to graduate fields

Computational Biology

2103 Member, Admissions Committee

Plant Pathology and Plant-Microbe Biology

2015- Director of Graduate Studies
2014- Member, Admissions committee
2013 *Ad hoc* member, Graduate Admissions committee