

Jan E. Leach

University Distinguished Professor, Colorado State University
Associate Dean for Research, College of Agricultural Sciences
Institute Adjunct Scientist, International Rice Research Institute, Philippines

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Professional Preparation:

University of Nebraska, Lincoln, Microbiology, B.S. with Honors, 1975
University of Nebraska, Lincoln, Microbiology, M.S., 1977
University of Wisconsin, Madison, Plant Pathology, Ph.D., 1981
East Malling Research, Kent, UK, Postdoctoral Fellow, Plant Pathology & Biochemistry, '81-'84

Appointments:

Colorado State University, Research Associate Dean, College of Agricultural Sciences, 2015-
Colorado State University, University Distinguished Professor, 2007-
Colorado State University, Professor, Bioagricultural Sciences and Pest Management, 2004-
Kansas State University, University Distinguished Professor, Dept Plant Pathology, 1998-2004
Kansas State University, Assistant- Full Professor, Dept Plant Pathology, 1984-1998

Professional Recognition and Service (selected):

2014-- Member, RICE Oversight Committee, a global rice science initiative
2016-- Noble Foundation Plant Biology Division Non-Resident Fellow
2016-- Member, Joint BioEnergy Institute Advisory Committee
2016 Citrus Research Board HLB External Scientific Review Panel
2015-- Co-Editor (w/ S Lindow), *Annual Review of Phytopathology* (Ed board since 2003)
2012-2017 National Science Advisory Board for Biosecurity (NSABB), appointed member
2011-- Scientific Advisory Board, Keystone Symposia (ad hoc member 2009-10)
2011-2015 Pierce's Disease/GWSS Research Scientific Advisory Panel member
2011 USDA-NIFA Understanding Plant-Associated Microbes Panel member
2010-2015 Chair, American Phytopathological Society Public Policy Board (member since 2001)
2007-2015 Editorial Board, *RICE* (Springer)
2008-13 Advisor: Research Core for Interdisciplinary Science, Okayama University, Japan
2004-08 Presidential lineage (President, 2007) American Phytopathological Society
2006-07 Chair, AAAS Section O (Agriculture)
2006-09 Member, ASM Committee on Agriculture and Food Microbiology
2004 E.C. Stakeman Award in Plant Pathology, U. Minnesota
2002 Fellow, American Association for the Advancement of Science
2000-04 Advisory Board Member, US Rice Genome Sequencing Project
2000 Fellow, American Academy of Microbiology
1998 Fellow, American Phytopathological Society

Synergistic Activities

--Teaching and training:

- Co-organizer: *Rice Research to Production Course*, 3-wk intensive course at the International Rice Research Institute (Philippines) 2015-017 http://www.ricediversity.org/outreach_new/course/
- Co-PI on NSF-IGERT: interdisciplinary training in bioenergy related fields
- Co-developed and taught (1999-2015) an Internet 2- interactive (real time) graduate course in Molecular Plant-Microbe Interactions (KSU, CSU, OK State, Oregon State, Univ Nebraska)
- Direct research of 1-4 undergrads/yr

- Member of Colorado Alliance for Graduate Education for the Professorate (AGEP) faculty, which seeks to increase the number of minority students in the STEM
- International research*: >25 yr collaboration w/ International Rice Research Institute (Philippines).
 - Collaborations in Japan, Korea, Brazil, France
 - Hosted & trained scholars, postdocs & students from Brazil, Senegal, Korea, Thailand, Philippines, India, Nepal, Japan, Guatemala, Colombia, Yugoslavia, France, China, Peru, etc.
- Science Policy*: APS Public Policy Board; development and advocacy of Phytobiomes Initiative for research to advance agricultural productivity and quality

Publications (since 2012)

- Shidore T, J Kirkwood, C Broeckling, J Long, B Zhao, JE Leach, L Triplett. 2017. The effector AvrRxo1 phosphorylates NAD in planta. *PLOS Pathogens* (in press)
- Leach JE, LR Triplett, C Argueso, P Trivedi. 2017. Communication in the Phytobiome. *Cell* 169:587-596
DOI: 10.1016/j.cell.2017.04.025
- Busby PE, C Soman, MR Wagner, ML Friesen, J Kremer, A Bennett, M Morsy, JA Eisen, **JE Leach**, J Dangl. 2017. Research priorities for harnessing plant microbiomes in sustainable agriculture. **PLoS Biology**. 15(3): e2001793. doi: [10.1371/journal.pbio.2001793](https://doi.org/10.1371/journal.pbio.2001793)
- Tanger P, ST Klassen, JP Mojica, JT Lovell, BT Moyers, M Baraoidan, MEB Naredo, KL McNally, J Poland, DR Bush, H Leung, **JE Leach**, JK McKay. 2017. Field-based high throughput phenotyping enables rapid discovery of genomic regions controlling yield components in rice. *Scientific Reports* 7:42839. doi: 10.1038/srep42839.
- Korus, K, JM Lang, A Adesemoye, CC Block, N Pal, **JE Leach**, TA Jackson-Ziems. 2017. First Report of *Xanthomonas vasicola* causing bacterial leaf streak on corn in the United States. *Plant Disease* (in press) <http://dx.doi.org/10.1094/PDIS-10-16-1426-PDN>
- Langlois P, J Snelling, JP Hamilton, C Bragard, R Koebnik, V Verdier, LR Triplett, J Blom, NA Tisserat, **JE Leach**. 2017. Characterization of the *Xanthomonas translucens* complex using draft genomes, comparative genomics, phylogenetic analysis, and diagnostic LAMP assays. *Phytopathology* 107:519-527. doi: 10.1094/PHYTO-08-16-0286-R
- Vera Cruz CM, B Cottyn, MH Nguyen, J Lang, V Verdier, TW Mew, **JE Leach**. 2017. Detection of *Xanthomonas oryzae* pv. *oryzae*, and *X. oryzae* pv. *oryzicola* in rice seeds (Chapter 8). In *APS Manual on Detection of Plant Pathogenic Bacteria in Seed and Other Planting Material*. APS Press, Minneapolis, MN. ISBN 978-0-89054-539-3.
- Nagel R, P Turrini, R Nett, **JE Leach**, V Verdier, M Van Sluys, R Peters. 2017. An operon for production of bioactive gibberellin A4 phytohormone with wide distribution in the bacterial rice leaf streak pathogen *Xanthomonas oryzae* pv. *oryzicola*. *New Phytologist* 214(3):1260-1266. doi: 10.1111/nph.14441
- Ghazi IA, I Zarei, JO Mapesa, JR Wilburn, **JE Leach**, S Rao, CD Broeckling, A McClung, EP Ryan. 2016. Rice bran extracts inhibit invasion and intracellular replication of *Salmonella typhimurium* in mouse and porcine intestinal epithelial cells. *Medicinal & Aromatic Plants* 5:271-281 doi: 10.4172/2167-0412.1000271
- Triplett LR, T Shidore, J Long, J Miao, S Wu, Q Han, C Zhou, H Ishihara, J Li, B Zhao, **JE Leach**. 2016. AvrRxo1 is a bifunctional type III secreted effector and toxin-antitoxin system component with homologs in diverse environmental contexts. *PLoSOne* 11(7):e0158856. doi: 10.1371/journal.pone.0158856
- Triplett LR, S Cohen, C Heffelfinger, C Tekete, V Verdier, CL Schmidt, A Huerta, S Dellaporta, AJ Bogdanove, **JE Leach**. 2016. A resistance locus in the American heirloom rice variety Carolina Gold Select is triggered by diverse TAL effectors and is effective against African strains of *Xanthomonas oryzae* pv. *oryzicola*. *Plant J* 87(5):472-83. doi: 10.1111/tpj.13212.

- Liu Q, J Yang, S Zhang, J Zhao, A Feng, T Yang, X Wang, X Mao, J Dong, X Zhu, H Leung, **JE Leach**, B Liu. 2016. OsGF14e positively regulates panicle blast resistance in rice. *Biochem Biophys Res Commun.* 471:247-52.
- Liu Q, J Yang, S Zhang, J Zhao, A Feng, T Yang, X Wang, X Mao, J Dong, X Zhu, H Leung, **JE Leach**, B Liu. 2016. OsGF14b positively regulates panicle blast resistance but negatively regulates leaf blast resistance in rice. *Mol Plant Microbe Interact.* 29:46-56.
- Triplett L, Leach JE. 2016. Host mechanisms for resistance to TAL effectors: Thinking outside the UPT box. *Physiol Mol Plant Pathol* [doi:10.1016/j.pmpp.2016.02.002](https://doi.org/10.1016/j.pmpp.2016.02.002)
- Booher NJ, Carpenter S, Sebra R, Wang L, Salzberg S, **Leach JE**, Bogdanove AJ. 2015. SMRT sequencing of *Xanthomonas oryzae* genomes reveals a dynamic structure and complex TAL effector gene relationships. *Microbial Genomics* doi: [10.1099/mgen.0.000032](https://doi.org/10.1099/mgen.0.000032)
<http://mgen.microbiologyresearch.org/content/journal/mgen/10.1099/mgen.0.000032>
- Han Q, Zhou C, Wu S, Liu Y, Triplett L, Miao J, Tokuhisa J, Deblais L, Robinson H, **Leach JE**, Li J, Zhao BY. 2015. Crystal structure of the complex between *Xanthomonas* AvrRxo1-ORF1, a type III effector with a polynucleotide kinase domain, and its interactor AvrRxo1-ORF2. *Structure* 23:1900-9 doi: 10.1016/j.str.2015.06.030
- Campillo, T, E Luna, P Portier, M Fishcer-LeSaux, N Lapitan, NA Tisserat, **JE Leach**. 2015. *Erwinia iniecta* *asp. nov.* is released into plant tissues while Russian wheat aphids (*Diuraphis noxiai*) feed. *International Journal of Systematic and Evolutionary Microbiology.* 65: 3625-3633 doi: 10.1099/ijsem.0.000466
- Tanger, P, ME Vega-Sánchez, M Fleming, K Tran, S Singh, JB Abrahamson, CE Jahn, N Santoro, EB Naredo, M Baraoidan, JMC Danku, DE Salt, KL McNally, H Leung, PC Ronald, DR Bush, JK McKay, **JE Leach**. 2015. Cell wall composition of rice straw varies among environments, varieties, and tissue types: impacts on bioenergy potential. *BioEnergy Research* DOI: 10.1007/s12155-014-9573-y;
<http://link.springer.com/article/10.1007%2Fs12155-014-9573-y>
- Triplett L, V Verdier, T Campillo, C Van Malderghem, M Maes, L Deblais, R Corral, O Koita, B Cottyn, **JE Leach**. 2015. Characterization of a novel clade of *Xanthomonas* isolated from rice leaves in Mali and proposal of *Xanthomonas maliensis sp. nov.* *Antonie van Leeuwenhoek* 107:869-881; DOI: 10.1007/s10482-015-0379-5
- Wiersma, AT, TA Gaines, C Preston, JP Hamilton, D Giacomini, CR Buell, **JE Leach**, P Westra. 2015. Gene amplification of 5-eno-pyruvylshikimate-3-phosphate synthase in glyphosate-resistant *Kochia scoparia*. *Planta* 241:463-474. DOI 10.1007/s00425-014-2197-9
- Zhao, J, S Zhang, T Yang, Z Zeng, Z Huang, Q Liu, X Wang, **JE Leach**, H Leung, B Liu. 2015. Global transcriptional profiling of a cold-tolerant rice variety under moderate cold stress reveals different cold stress response mechanisms. *Physiologia Plantarum* 154:381-394 doi: 10.1111/pp1.12291.
- Tonnessen B, P Manosalva, JM Lang, M Baraoidan, A Bordeos, R Mauleon, J Oard, S Hulbert, H Leung, **JE Leach**. 2015. Rice phenylalanine ammonia-lyase gene *OsPAL4* is associated with broad spectrum disease resistance. *Plant Mol Biol* 87:273-286. DOI: [10.1007/s11103-014-0275-9](https://doi.org/10.1007/s11103-014-0275-9).
- Yu, C, H Chen, F Tian, **JE Leach**, C He. 2014 Transcriptomic analysis of overlapping responses to *Xanthomonas oryzae* pv. *oryzae* infection and nitrogen deficiency revealed co-regulatory components in rice. *Rice* 7:20- doi: 10.1186/s12284-014-0020-7
- Lang, JM, P Langlois, MHR Nguyen, L Purdie, T Holton, A Djikeng, C Vera Cruz, V Verdier, **JE Leach**. 2014. Sensitive detection of *Xanthomonas oryzae* pv. *oryzae* and *X. oryzae* pv. *oryzicola* by Loop Mediated Isothermal Amplification. *Appl Environ Microbiol* 80: 4519-4530 (doi: 10.1128/AEM.00274-14)
- Anderson, V, S Haley, F Peairs, L vanEck, **JE Leach**, N Lapitan. 2014. Virus-induced gene silencing suggests that (1,3;1,4)- β -glucanase is a susceptibility factor in compatible Russian wheat aphid – wheat Interactions. *Mol Plant-Microbe Interact* 27:913-922

- vanEck, L, R Davidson, S Wu, B Zhao, AM Botha, **JE Leach**, NL Lapitan. 2014. The transcriptional network of WRKY53 in cereals links oxidative responses to biotic and abiotic stress inputs. *Funct & Integr Genom* 14:351-362 (doi: [10.1007/s10142-014-0374-3](https://doi.org/10.1007/s10142-014-0374-3))
- Liu W, J Liu, L Triplett, **JE Leach**, GL Wang. 2014. Novel insights into rice innate immunity against bacterial and fungal pathogens. *Annu Rev Phytopathol* 52: 213-241. (10.1146/annurev-phyto-102313-045926).
- Wonni I, Cottyn B, Detemmerman L, Dao S, Ouedraogo L, Sarra S, Tekete C, Poussier S, Corral R, Triplett L, Koita O, Koebnik R, **Leach J**, Szurek B, Maes M, Verdier V. 2014. Analysis of *Xanthomonas oryzae* pv. *oryzicola* population in Mali and Burkina Faso reveals a high level of genetic and pathogenic diversity. *Phytopathology* 104:520-131.
- Fory PA, Triplett L, Ballen C, Abello J, Duitama J, Aricama G, Prado GA, Correa F, Hamilton J, **Leach J**, Tohme J, Mosquera GM. 2013. Comparative analysis of two emerging rice seed bacterial pathogens. *Phytopathology* 104:436-444.
- Ash GJ, JM Lang, LR Triplett, BJ Stodart, V Verdier, C Vera Cruz, P Rott, **JE Leach**. 2014. Development of a genomics-based LAMP (Loop-1 mediated isothermal amplification) assay for detection of *Pseudomonas fuscovaginae* from rice. *Plant Dis* 98:909-915 (doi: 10.1094/PDIS-09-13-0957-RE)
- Tanger, P, JL Field, CE Jahn, M DeFoort, **JE Leach**. 2013. Biomass for thermochemical conversion: targets and challenges. *Frontiers in Plant Science* 4:218 doi: 10.3389/fpls.2013.00218.
- Fletcher J, **JE Leach**, K Eversole, R Tauxe. 2013. Human pathogens on plants: Designing a multidisciplinary strategy for research. *Phytopathology* 103:306-15. doi: 10.1094/PHYTO-09-12-0236-IA
- Boyd L, C Ridout, D O'Sullivan, **JE Leach**, H Leung. 2013. Plant-pathogen interactions: Disease resistance in modern agriculture. *Trends in Genetics* 29: 233-240