

Ksenia V. Krasileva

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Citizenship: United States

EDUCATION

- PhD in Microbiology. Designated Emphasis in Genomics & Computational Biology
University of California, Berkeley. 2011.
- Bachelors in Microbiology, Genetics and Plant Biology. Honors.
University of California, Berkeley. 2005.

PROFESSIONAL TRAINING

- **Post-doctoral Fellow. HHMI & University of California, Davis.** 2011-present

Federal funding: AFRI-NIFA Fellowship “Development of functional genomics tools for wheat” United States Department of Agriculture. \$130,000 2012-2014

Advisor: Jorge Dubcovsky.

- Development of functional genomics tools for wheat
- Screening wheat mutant populations for increased resistance to rusts

- **Graduate Student Researcher. University of California, Berkeley.** 2005-2011

Advisor: Brian J Staskawicz

Computational advisor: Kimmen Sjolander

- The molecular basis for recognition of oomycete effectors in *Arabidopsis*
- Genomics and pathogenicity factors in *Xanthomonas*

- **Undergraduate Student Researcher. University of California, Berkeley.** 2002-2005

Advisor: Steven E Lindow

- Quorum sensing in *Pseudomonas*

RESEARCH PROGRAM

My research program combines **wheat genomics** and **plant-microbe interactions**. Specifically, I am focused on cultivated wheat and its interaction with fungal pathogens. I am dedicated to the development and application of functional genomics tools to revolutionize wheat research. This work is of central importance to the generation of sustainable crops for the future.

From the very beginning of my post-doc, I focused on adopting **exome-capture** and **next generation sequencing technologies** to sequence 1,500 lines from an EMS-mutagenized population of durum wheat. The prediction of the wheat proteome is the first necessary step towards development of exome capture technology and efficient sequencing of large collections of either natural or mutagenized wheat lines. As such, I sequenced the transcriptome of our wheat species and led the development of a novel strategy for assembling a tetraploid wheat transcriptome in which homeologous sequences are separated by phasing of mapped Illumina reads (Krasileva et al. 2013). This transcriptome was used to design a custom exome capture for sequencing wheat mutant lines. Exome capture technique allows the identification of several hundred mutations in the protein-coding sequences in each line and computational prediction of their effect on protein function. The resulting set of sequenced EMS lines comprises the first reverse genomics resource in wheat.

During 2012-2013, I conducted a forward genetics screen by exposing our mutagenized wheat population to natural disease pressure in the field and identified mutants with either **enhanced resistance** or **increased disease susceptibility** to stripe rust. Wheat exome capture technology has enabled me to rapidly map these mutations and start investigating **wheat innate immunity**.

Most recently, I established collaboration with the International Atomic Energy Institute (IAEI) and the Food and Agriculture Organization (FAO) of the United Nations. I am bringing my expertise in wheat exome capture and re-sequencing to aid in **Efficient Screening Techniques for Mutants with Disease Resistance**, specifically to Ug99 races and wheat improvement Kenya.

PUBLICATIONS

12 publications (5 as first/co-first author)

Henry IM, Nagalakshmi U, Lieberman MC, Ngo KJ, **Krasileva KV**, Vasquez-Gross H, Alina Akunova A, Akhunov E, Dubcovsky J, Tai TH and Comai L “Efficient genome-wide detection and cataloging of EMS-induced mutations using exome capture and next-generation sequencing” *Plant Cell*, 26:1382-1397 (2014)

- Krasileva KV**, Buffalo V, Bailey P, Pearce S, Ayling S, Tabbita F, Soria M, Wang S, Consortium I, Akhunov E, Uauy C, Dubcovsky J: “Separating homeologs by phasing in the tetraploid wheat transcriptome”. *Genome Biology* 2013, 14:R66. (2013)
- Bart R, Cohn M, Kassen A, McCallum EJ, Shybut M, Petriello A, **Krasileva K**, Dahlbeck D, Medina C, Alicai T, Kumar L, Moreira LM, Neto JR, Verdier V, Santana MA, Kositscharoenkul N, Vanderschuren H, Gruissem W, Bernal A, Staskawicz BJ. “High-throughput genomic sequencing of cassava bacterial blight strains identifies conserved effectors to target for durable resistance.” *Proceeding of National Academy of Sciences U S A*, 109(28):E1972-9. (2012)
- Goritschnig S, **Krasileva KV**, Dahlbeck D, Staskawicz BJ. “Computational prediction and molecular characterization of an oomycete effector and the cognate Arabidopsis resistance gene” *PLoS Genetics* 8(2):e1002502. (2012)
- Win J, **Krasileva KV**, Kamoun S, Shirasu K, Staskawicz BJ, Banfield MJ. “Sequence divergent RXLR effectors share a structural fold conserved across plant pathogenic oomycete species” *PLoS Pathogens* 8(1): e1002400. (2012)
- Krasileva KV**, Zheng C, Leonelli L, Goritschnig S, Dahlbeck D, Staskawicz BJ. “Global analysis of *Arabidopsis* / downy mildew interactions reveals prevalence of incomplete resistance and rapid evolution of pathogen recognition” *PLoS One*, 6: e28765. (2011)
- Zhao B, Dahlbeck D, **Krasileva KV**, Fong RW, Staskawicz BJ. “Computational and Biochemical Analysis of the Xanthomonas Effector AvrBs2 and Its Role in the Modulation of Xanthomonas Type Three Effector Delivery.” *PLoS Pathogens*. 12 :e1002408. (2011)
- Chou S*, **Krasileva KV***, Holton J, Steinbrenner A, Alber T, Staskawicz BJ. “*Hyaloperonospora arabidopsidis* ATR1 effector is a repeat protein with distributed recognition surfaces” *Proceeding of National Academy of Sciences U S A*. 108(32): 13323-8. (2011)
- *equal contribution**
- Potnis N*, **Krasileva K***, Chow V, Almeida NF Jr, Patil PB, Ryan RP, Sharlach M, Behlau F, Dow JM, White FF, Preston JF, Vinatzer BA, Koebnik R, Setubal JC, Norman DJ, Staskawicz BJ, Jones JB. “Comparative Genomics Reveals Diversity among Xanthomonads Infecting Tomato and Pepper”. *BMC Genomics*, 12(1): 146. (2011)
- *equal contribution**
- Krasileva KV**, Dahlbeck D, Staskawicz BJ. “Activation of an *Arabidopsis* Resistance Protein Is Specified by the *in Planta* Association of Its Leucine-Rich Repeat Domain with Cognate Oomycete Effector”. *Plant Cell*, 22:1-16. (2010)
- Dulla GF, **Krasileva KV**, Lindow SE. “Interference of Quorum Sensing in *Pseudomonas syringae* by Bacterial Epiphytes that Limit Iron Availability”. *Environmental Microbiology*, 12(6): 1762-74. (2010)

Win J, Morgan W, Bos J, **Krasileva KV**, Cano LM, Chaparro-Garcia A, Ammar L, Staskawicz BJ, Kamoun S. “Adaptive Evolution Has Targeted the C-terminal Domain of the RXLR Effectors of Plant Pathogenic Oomycetes”. *Plant Cell*, 19: 2349-69. (2007)

PRESENTATIONS

2014 *Plant and Animal Genome Conference*, San Diego, CA. Invited Speaker

2013 *Beyond the Genome Conference*, San Francisco, CA. Selected Speaker

2012 *New Phytologist Conference*, Fallen Leaf Lake, CA. Poster

2012 *Howard Hughes Medical Institute Conference*, Janelia Farm, VA. Poster

2011 *Department of Plant Pathology Seminars*, Davis, CA. Invited Speaker

2010 *Gordon Research Conference*, Holderness, NH. Poster

2010 *International Congress MPMI*, Quebec, Canada. Selected Speaker

2008 *Bay Area Microbial Pathogenesis Symposium*, San Francisco, CA. Selected Speaker

2008 *Keystone Symposium in Plant Innate Immunity*, Keystone, Colorado. Poster

2007 *Bay Area Microbial Pathogenesis Symposium*, San Francisco, CA. Poster

TEACHING

- Panel speaker in a workshop on grant writing for post-docs 2014
- Mentor of pre-graduate bioinformatics specialists, UC Davis 2012-2014
- Undergraduate Research Mentor, UC Berkeley 2007-2011
- Guest Lecturer for “Agriculture and Society”, UC Berkeley 2008-2010
- Teaching Assistant for “Introduction to Programming for Bioinformatics”, UC Berkeley 2007
- Graduate Student Instructor for “Introduction to Comparative Virology”, UC Berkeley 2007

- Graduate Student Instructor for “Introductory Biology 1A”, UC Berkeley 2006
Outstanding Graduate Student Instructor Award
- Course Developer and Instructor, “Summer Explorations in Microbiology” 2006
UC Berkeley

OUTREACH

- Invited Speaker for Sally Ride Science Camp for girls, UC Berkeley 2011
- Panel Speaker for Biology Majors Fair, 2007-2008
“Beyond the B.A.: Graduate and Professional Schools”, UC Berkeley
- Volunteer in Community Outreach and Education 2006
“Agriculture, Molecular Biology and Genetically Modified Organisms: GMOs in Food”
Advanced training of UCCE Master Gardeners in Santa Clara County w/ Peggy Lemaux

AWARDS

2012-2014 Federal Principle Investigator grant through the United States Department of Agriculture AFRI-NIFA postdoctoral fellowship program.

2007 Outstanding Graduate Student Instructor Award, UC Berkeley.

2006 Honorable Mention, NSF Graduate Student Fellowship.

2005 Plant and Microbial Biology departmental citation, UC Berkeley.

2003-2005 Sponsored Projects for Undergraduate Research Fellowship, UC Berkeley.

2004 Summer Undergraduate Research Fellowship, UC Berkeley.

SOCIETIES

American Association for the Advancement of Science.

The International Society for Molecular Plant-Microbe Interactions.

REFERENCES

Dr. Jorge Dubcovsky

UC Davis Professor & Howard Hughes Medical Institute researcher
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Dr. Brian J. Staskawicz

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