

Curriculum Vitae

Nrupali Patel, Ph.D.

Rutgers, The State University of New Jersey
School of Environmental and Biological Sciences
Department of Plant Biology
59 Dudley Rd
New Brunswick, NJ 08550

Phone: (848) 932-6392 (office)
(919) 280-9576 (cell)

Email: npatel@sebs.rutgers.edu

Education:

North Carolina State University, Raleigh, NC

- Ph. D., Plant Pathology, 2008.

University of Tennessee, Knoxville, TN

- M.S., Plant Science, 2003.

Rhodes University, Grahamstown, South Africa

- B. S., Honors, Biotechnology, 2001
- B.S., Microbiology and Biochemistry, 2000

Professional Appointments:

Teaching Instructor (Sept, 2017 – present). Department of Plant Biology and Pathology, Rutgers, The State University of New Jersey. New Brunswick

Professional Research Manager Seasonal (July, 2017 – Sept, 2017). Department of Plant Biology and Pathology, Rutgers, The State University of New Jersey. New Brunswick

Lecturer (Part-time) (Feb, 2017 – June, 2017). Department of Plant Biology and Pathology, Rutgers, The State University of New Jersey. New Brunswick

Professional Research Manager Seasonal (August, 2016 - Jan, 2017). Department of Plant Biology and Pathology, Rutgers, The State University of New Jersey. New Brunswick

Lecturer (Part-time) (Feb, 2016 – June, 2016). Department of Plant Biology and Pathology, Rutgers, The State University of New Jersey. New Brunswick

Lecturer (Part-time) (Sept, 2015 – Jan, 2016). Department of Plant Biology and Pathology, Rutgers, The State University of New Jersey. New Brunswick

Visiting Faculty (2013-2014). Dev Sanskriti University, Haridwar, India

Research Associate (2012-2013). Department of Plant Biology and Pathology, Rutgers, The State University of New Jersey. New Brunswick

Post-doctoral Associate (2008 – 2012). Department of Plant Biology and Pathology. Rutgers, The State University of New Jersey. New Brunswick

Graduate Research Assistant in the PhD Program (2003-2008). Department of Plant Pathology. North Carolina State University. Raleigh

Graduate Research Assistant in the MS. Program (2001-2003). Department of Plant Science, University of Tennessee, Knoxville.

Publications:

- de Bruijn I., Cheng, X., de Jager, V., Expósito, R.G., Watrous, J., Patel, N., Joeke P., Dorrestein, P.C., Kobayashi, D. and Raaijmakers, J.M. 2015. **Comparative genomics and metabolic profiling of the genus *Lysobacter***. BMC Genomics. 16: 991. DOI 10.1186/s12864-015-2191-z.
- Patel, N., Oudemans, P.V., Hillman, B.I., and Kobayashi, D.Y. 2013. Use of the tetrazolium salt MTT to measure cell viability effects of the bacterial antagonist ***Lysobacter enzymogenes*** on the filamentous fungus ***Cryphonectria parasitica***. Ant. van Leeuwen. 103:1271-1280
- Mathioni, S.M., Patel, N., Riddick, B., Sweigard, J.A., Czymmek, K.J., Caplan, J.L., Kunjeti, S.G., Kunjeti, S., Raman, V., Hillman, B.I., Kobayashi, D.Y., Donofrio, N.M. 2013. Transcriptomics of the Rice Blast Fungus ***Magnaporthe oryzae*** in Response to the Bacterial Antagonist ***Lysobacter enzymogenes*** reveals candidate fungal defense response genes. PLoS One. 8 (10): e76487
- Patel N., Li C, Hamamouch N., Mitchum, M.G., Baum, T.J, Hussey, R.S., and Davis, E.L. 2010. Isolation and functional analysis of an annexin-like parasitism gene of cyst nematodes (*Heterodera* spp.). J Exp Bot. 2010 January; 61(1): 235–248.
- Patel N., Hamamouch N., Li C., Hussey R, Mitchum M., Baum T., Wang X., Davis E. 2008. Similarities and functional analysis of expressed parasitism genes in ***Heterodera schachtii*** and ***Heterodera glycines***. Journal of Nematology. 40: 299-310
- Patel N., Cardoza V., Christensen E., Rekapalli B., Ayelew M., Stewart C.N., Jr. (2004). Differential gene expression of ***Chlamydomonas reinhardtii*** in response to 2,4,6-trinitrotoluene (TNT) using microarray analysis. Plant Science 167: 1109-1122.

Manuscripts in preparation:

- Patel et al. The type IV pilus of ***Lysobacter enzymogenes*** is involved in gliding motility and establishing initial stages of pathogenic interactions with fungal hosts. (**Manuscript in prep.** Target journal: Appl. Env. Microbiol).
- Patel et al. Occurrence of bacterial wilt of highbush blueberry in New Jersey caused by ***Ralstonia solonacearum***. (**Manuscript in prep.** Target journal: Plant Disease).
- Patel et al. First report of ***Dickeya dianthicola*** spp. causing blackleg and potato soft rot in New Jersey. (**Manuscript in prep.** Target journal: Plant Disease (plant disease report)).

Abstracts:

- Patel, N., Oudemans, P.V., Kobayashi, D., Constantelos, C. 2013. **Ralstonia solanacearum**, a new pathogen of highbush blueberry. *Phytopathology* 103 (Suppl. 2):S2:112.
- Patel N., Oudemans P., Hillman B., Kobayashi D. 2013. A viability Assay to Evaluate Direct Effects of Biological Control Agents and Fungal Cells. In Proceedings of the 22nd Annual Rutgers Turfgrass Symposium. Center for Turfgrass Science. F. Belanger and B. Fitzgerald, eds. p. 45.
- Kobayashi, D., Patel, N., Donofrio, N., and Hillman, B. 2012. Novel Strategies for Biorational Approaches to Turfgrass Disease Control – A Genomics Perspective. In Proceedings of the 21st Annual Rutgers Turfgrass Symposium. Center for Turfgrass Science. D. Kobayashi and B. Fitzgerald, eds. p. 17.
- N. Patel, M. Cornejo, D. Lambert, A. Craig, B. I. Hillman, D. Y. Kobayashi. 2011. A multifunctional role for the type IV pilus in the bacterial biological control agent **Lysobacter enzymogenes**. *Phytopathology* 101:S138
- D. Y. Kobayashi, N. Patel, B. I. Hillman, and J. Ravel. 2011. Pathogenesis as a mechanism of biological control by **Lysobacter enzymogenes** *Phytopathology* 101:S231
- Mathioni, S., Caplan, J., Patel, N., Czymmek, K.J., Sullivan, R.F., Kobayashi, D.Y., Donofrio, N.M. 2011. Understanding cellular and molecular interactions between the rice blast fungus and a putative biocontrol bacterium. *Phytopathology* 101:S116.
- Patel, N., Cornejo, M., Lambert, D., Craig, A., Hillman, B.I., and Kobayashi, D.Y. 2011. Characterization of type IV pilus function in the bacterial biocontrol agent **Lysobacter enzymogenes** strain C3. In Proceedings of the Twentieth Anniversary Rutgers Turfgrass Symposium. Center for Turfgrass Science. W.A. Meyer and B. Fitzgerald, eds. p. 47.
- Patel, N. Hillman, B.I. and Kobayashi, D.Y. 2010. Characterization of type IV pilus in the bacterial biocontrol agent **Lysobacter enzymogenes** strain C3. *Phytopathology* 100:S98.
- Mathioni, S.M., Sullivan, R.F., Patel, N., Kobayashi, D.Y. and Donofrio, N.M. 2010. Cellular and molecular interactions between the rice blast fungus and a potential biocontrol agent, **Lysobacter enzymogenes**. 9th International Mycological Congress, IMC9: The Biology of Fungi, Edinburgh, Scotland.
- Patel N. M. Blackmoore, B. Hillman, D. Kobayashi. 2009. Evidence for the role of Type VI secretion during **Lysobacter enzymogenes** pathogenesis of fungal hosts. *Phytopathology* 99:S100
- Blackmoore, M., Patel, N., Hillman, B. and Kobayashi, D. 2009. Involvement of type IV secretion in **Lysobacter enzymogenes** pathogenesis of fungal and algal hosts. *Phytopathology* 99:S12.
- Patel N., R. Sullivan, N. Donofrio, D. Kobayashi, B. Hillman 2009. Intracellular pathogenesis of filamentous fungi by the biocontrol bacterium **Lysobacter enzymogenes**. 25th Fungal Genetics Conference, Asilomar, CA
- Patel, N. Sullivan, R., Donofrio, N. Kobayashi, D. and Hillman, B. 2009. Intracellular pathogenesis of filamentous fungi by the biocontrol bacterium **Lysobacter enzymogenes**. 25th Fungal Genetics Conference. *Fungal Genetics Reports* 56S: 143.

- Kobayashi, D., Sullivan, R., Patel, N., Blackmoore, M., and Hillman, B. 2010. The Atkins approach to Biological Control: Does the High Protein/Low Carbohydrate Diet of **Lysobacter enzymogenes** specify host preference? In Proceedings of the Nineteenth Annual Rutgers Turfgrass Symposium. Center for Turfgrass Science. N. Zhang and B. Fitzgerald, eds. p. 17.
- Patel, N., C. Li, T. Baum, and R. Hussey, E. L. Davis. 2007. Isolation and Functional Analysis of an Annexin-Like Parasitism Gene of the Beet Cyst nematode, **Heterodera schachtii**. Second Annual NCSU Graduate Student Research Symposium, Raleigh, NC
- Patel N., H. Diab, B. Gao, X. Wang, R. Hussey, T. Baum, and E. L. Davis. 2006. The Isolation and Functional Analysis of Parasitism Genes of the Beet Cyst nematode, **Heterodera schachtii**. Forty-fifth Annual Meeting of the Society of Nematologists, Kauai, HI.
- Patel N., H. Diab, B. Gao, X. Wang, R.S. Hussey, T.J. Baum, and E.L. Davis. 2005. Identification and functional analysis of parasitism genes of the beet cyst nematode, **Heterodera schachtii**. Biennial meeting of the International Society for Molecular Plant-Microbe-Interactions in Cancun, Mexico.
- Patel N., H. Diab, B. Gao, X. Wang, R. S. Hussey, T. J. Baum, and E. L. Davis. 2004. Identification of putative parasitism genes of the beet cyst nematode (BCN), **Heterodera schachtii**. **Phytopathology** 94:S82.
- Patel N., C.N. Stewart. Screening **Arabidopsis thaliana** and **Chlamydomonas reinhardtii** for their phenotypic response to 2,4,6-trinitrotoluene (TNT). 2003. Congress on **In vitro** Biology, Portland, OR.
- Patel N., V. Cardoza, C.N. Stewart. Differential gene expression of **Chlamydomonas reinhardtii** in response to 2,4,6-trinitrotoluene (TNT) using microarray analysis. 2003. UT-Bioinformatics Summit, Pikeville, TN.

Oral Presentations:

- The type IV pilus plays a major role during interactions between the bacterial biological control agent **Lysobacter enzymogenes** and the fungal host **Cryphonectria parasitica**. 2012. American Phytopathological Society, Providence, RI
- Intracellular colonization of filamentous fungi by the biocontrol bacterium **Lysobacter enzymogenes**. 2009. 25th Fungal Genetics Conference, Asilomar, CA
- Isolation and Functional Analysis of an Annexin-Like Parasitism Gene of the Beet Cyst nematode, **Heterodera schachtii**. Joint Annual Meeting of the Society of Nematologists and American Phytopathological Society, San Diego, CA
- From Model Plant-Nematode system to Whole Plant Health. April 2006. Plant Pathology Society of North Carolina, Raleigh, NC

Teaching Experience and other Professional Experience:

- *Plant Science*: 200 level, Introductory plant science course for undergraduate majors and nonmajors (Sp 2017; Fa 2017)

- *Molecular Genetics Laboratory*: Biochemical and molecular aspects of gene function and gene recombination, with course designed to promote development of individual thinking and provide experience for presentation of data in oral and written forms. Responsibilities: development and teaching of mutagenesis and gene identification laboratories. (Sp 2016; Sp 2017).
- *General Plant Pathology Laboratory*: 300 level, undergraduate introductory laboratory course for majors and nonmajors (Fa 2015; Fa 2016).
- Guest Lecturer “Plant Pathogenic Nematodes” (Fa 2012; Fa 2016). Dept. of Plant Biology and Pathology, Rutgers. Plant Biology Graduate Course: Principles in Plant Pathology.
- Guest Lecturer and Seminar Guest Host, Plant Biology Graduate Course: Core Seminar II in Plant Biology (Sp 2013; E. Davis, NC State University, seminar speaker)
- Undergraduate research mentor June 2009 to present. Dept. of Plant Biology and Pathology, Rutgers
 - GHCook Scholars
 - Qian, X. 2010-2011
 - M. Conejo* 2010-2011
 - D. Lambert* 2012-2013
 - S. Bannikuppe 2015-2016
 - *Also served as GHCook Scholars Thesis reviewer
 - Independent research (Biotechnology undergraduate program)
 - A. Baldwin
 - R. Patel
 - A. Craig
 - C. Kozar
 - K. Hullen
 - L. West
 - E. Chi
 - A. Sobel
 - J. Shah
 - Graduate student laboratory training
 - P. Fardella (2016; Plant Biology)
 - I. Armas (2013; Plant Biology)
 - S. Saraihom (2012, Department of Botany, Faculty of Science Chulalongkorn University, Thailand)
 - F. Foflonker (2012; Microbial Biology)
 - G. Behringer (2010; Plant Biology)
- Plant Nematology, Teaching Assistant, Jan – May 2005. Dept. of Plant Pathology. North Carolina State University.
- Training undergraduate students in lab techniques, 2004 – 2008. Dept. of Plant Pathology. North Carolina State University.
- Plant Disease: Methods and Diagnosis, Teaching Assistant, Aug – Dec 2004. North Carolina State University.
- Major Concepts in Biology BIO 105, Laboratory Instructor, University of North Carolina, Greensboro. Aug – May 2001-2002.

- Conservation Biology Course, Teaching Assistant, Aug - May 2001-2002. University of North Carolina, Greensboro.
- Undergraduate technician in Membrane Biotechnology Lab, Rhodes University, Dept. of Microbiology and Biochemistry Jan – Dec 2000.
- Undergraduate administrative assistant, Rhodes University, Dept. of Pharmacology, Jan 1998 - Dec 1999.

Honors and Grants:

- USDA APHIS Farm Bill/New Jersey Department of Agriculture
Role: cooperator (PIs: S. Vaicunus; D. Kobayashi)
Funding: \$19,048
Title: Potato Disease and Nematode Survey in New Jersey
New Jersey Blueberry and Cranberry Research Council 2013
Title: Characterizing bacterial wilt, a new and potentially devastating disease of blueberry in New Jersey.
Role: PI (Co-PI: P. Oudemans)
Funding: \$7,000
- New Jersey Agricultural Experiment Station Competitive Research Fund 2012
Title: Investigating the regulon of the Clp global regulator in **Lysobacter enzymogenes**
Role: PD (Co-PD: Kobayashi D.)
Funding: \$8,000
- Rutgers University Turf Grass Center 2012
Title: Identifying fungal susceptibility genes as novel targets for disease control
Role: Co-PD (PD: D. Kobayashi; Other Co-PDs: C. Cai and B. Hillman)
Funding: \$45,000
- Dow Travel Award – Society of Nematologists (2007) - \$500.
- North Carolina State University, University Graduate Student Association Travel Award (2007) - \$250.
- North Carolina State University Graduate Student Research Symposium (2007) – 1st Place and \$250.
- R. J. Reynolds Tobacco Company Fellowship (2006-2007) - \$4000.
- Graduate Student Travel Award - Plant Pathology Society of North Carolina (2006) - \$500.
- R. J. Reynolds Tobacco Company Fellowship (2005-2006) - \$4000.
- Graduate Student Travel Award - Molecular Plant Microbe Interaction (2005) - \$350.
- A.C. & Hedwig Triantaphyllou Endowment (2003-2004) - \$2000.
- Student travel grant from the College of Agricultural Sciences and Natural Resources, University of Tennessee, Knoxville, TN (2003).
- Student travel grant from the Department of Plant Sciences and Landscape Systems, University of Tennessee, Knoxville, TN (2003).
- Rhodes University scholastic scholarship award (2000).
- Rhodes University Academic achievement award (1999).

Service

Professional:

- Academic Advisor and Administrator, Horticultural Therapy Certificate Program, Rutgers University
- Interim Coordinator, Graduate and Undergraduate Academic Programs in Plant Biology (July-August 2016). Provided temporary administrative support for the Graduate Program in Plant Biology, and undergraduate programs in Agriculture and Food Systems, Biotechnology, and Plant Biology.
- Bacterial identification of plant diseases: Procedures include isolation and purification of causal agent, identification of causal agent to Genus, species level using PCR/qPCR and verification of causal agent by reproducing disease symptoms on original host.
- 2012 Atlantic Blueberry Company consultation meeting. Met with growers to discuss results of detection and identification of a previously unknown disease (diagnosed as bacterial wilt). Also discussed problems and possible control measures associated with this new disease.
- Ad hoc journal manuscript reviewer
 - Biocontrol Science and Technology
 - Journal of Plant Physiology & Pathology
 - Indian Journal of Experimental Biology
- Grant reviewer for NJAES Competitive Intramural Research Awards Program for use of SEBS/NJAES Illumina Sequencing Facility.

Community:

- Presenter: Elementary school – career day – “Plants gets sick too!” – May 2017, Knollwood Elementary, Piscataway NJ. Outreach presentation describing the field of Plant Pathology to K-3 grades.
- 2009 to present: Developed a “Value-Based Education Program” at a local Hindu Community Center in Piscataway. Students aged 5-13 years learn the importance of community service. Outreach programs in agriculture (volunteering at a local farm) and the environment (tree plantation program in collaboration with NJ Tree Foundation) were implemented.

Professional Development and Society Affiliations:

- American Phytopathological Society
- Genetics Society of America
- Participated in the 2005 North Carolina State University College of Life Sciences’ Graduate Student Professional Development Workshop