# Curriculum vitae

**Pavan Kumar** ***Ph. D***
*Boyce Thompson Institute for Plant Research*
*Cornell University*
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## Educational qualifications

**Doctorate in Molecular Ecology (December 2013)**
Department of Molecular Ecology, Max Planck Institute (MPI) for Chemical Ecology, Jena Germany
**Thesis:** Revealing *Manduca sexta*'s nicotine metabolism and its ecological consequences using plant mediated RNAi based reverse genetics. **Supervisor**: Prof. Ian T. Baldwin

**Master of Science (MSc)** Biotechnology **(April 2005)**
Department of Biotechnology, Gulbarga University Gulbarga, India

**Bachelor of Science (BSc)** Biotechnology, Chemistry and Zoology **(April 2003)**
Karnataka College, Gulbarga University, Bidar, India

## Research interests

Plant mediated RNAi, xenobiotic detoxification by insect pests and plant productivity.

## Research experience

**Post doctorate fellow**
Boyce Thompson Institute for plant research, Ithaca NY USA **April 2014- present**
**Project 1:** Investigating molecular adaptation of potato plant overcompensation response to increase tuber yield
**Project 2:** Improving nutritional quality of potato tubers

**Senior research fellow**
National Center for Cell Science (NCCS) Pune, India **February 2008- January 2009**
**Project:** Role of matrix associated binding protein SMAR1 in transcriptional regulation of genes

**Project assistant September**
Plant Molecular Biology Unit, National Chemical Laboratory (NCL) Pune, India **September 2005- January 2008**
**Project**: Identification and characterization of plant proteinase-inhibitor insensitive lepidopteran insect *Helicoverpa armigera*'s midgut proteases

## Publications

1. Difference in nicotine metabolism of two herbivores of *Nicotiana attenuata* renders them differentially susceptible to a common native predator. **Kumar P**, Matthias Schoettner, Pandit SS, and Baldwin IT. ***PLoS One*** 2014, 9(4), e95982.

2. A natural history driven, plant mediated RNAi based study reveals CYP6B46's role in a nicotine-mediated anti-predator herbivore defense. **Kumar P**, Pandit SS, Steppuhn A, and Baldwin IT. ***Proc Natl Acad Sci USA*** 2013, 111: 1245-1252.
   **Press coverage**
   http://news.sciencemag.org/biology/2013/12/scienceshot-breath-so-bad-it-could-save-your-life#disqus_thread
   http://phenomena.nationalgeographic.com/2013/12/30/toxic-halitosis-protects-tobacco-eating-caterpillar/

3. Tobacco Rattle Virus vector: A rapid and transient means of silencing *Manduca sexta* genes by plant mediated RNA interference. **Kumar P**, Pandit SS, Baldwin IT. ***PLoS One*** 2012 7(2), e31347. (Press: https://rybicki.wordpress.com/tag/sirna/)

4. Spatial and temporal expression patterns of diverse Pin-II genes in *Capsicum annuum* Linn. Tamhane VA, Giri AP**,** **Kumar P**, Gupta VS. ***Gene.*** 2009**,** 442:1-2 (88-90

## Awards

- Gold medal for BSc on 22nd annual convocation of Gulbarga University, India (2004).
- R. V. Bidap higher education scholarship from Karnataka College (K.R.E.S Society) Bidar, India to pursue master degree (2004).
- Merit student fellowship during MSc from Gulbarga University, India (2005).
- Rank student in MSc Biotechnology (2005).
- DAAD doctoral fellowships to pursue PhD degree in Germany (2009).

## Projects

**MSc thesis**: Identification and characterization of glutamate decarboxylase in sugarcane (*Saccharum officinarum* .L) var.co.740 under salt stress. Department of Biotechnology, Gulbarga University Gulbarga, India (2005).
**Supervisor**: Prof. G. R. Naik.

**BSc Thesis**: Bio processing of organic wastes, for improved quality and quantity of bio-gas production, as an efficient source of fuel. Department of Biotechnology, Karnataka College Bidar, India (2003).
**Supervisor**: Dr. Vijay Kumar Biradar

## Technical skills

**Molecular biology:**
Virus Induced Gene Silencing
Gene cloning in bacterial and yeast cells
Primer designing, PCR and qRT-PCR
Northern, Southern and Western hybridizations
Expression and purification of recombinant proteins from heterologous systems (*E. coli* and yeast)
Animal cell culture and transfection
Lab rearing and maintenance of lepidopteran insect cultures

**Analytical chemistry:**
HPLC (reverse phase and chiral), LC-MS (UPLC/ESI-TOF and Q3-MS) and GC-MS

**Field work:**
Studied *N. attenuata- M. sexta* interactions at Great Basin Desert Utah, USA (2012-13)

**Scientific soft skills:**
Basic bioinformatics tools for data search, retrieval and analysis
StatView, ACD labs and MS office

## Language proficiency

- English (Fluent)
- Kannada (Mother tongue)
- Hindi, Marathi, Telugu (Fluent)
- German (Moderate) Qualified B1 level from EURSIA institute Berlin, Germany (2009)

## Oral presentations

- Plant mediated RNAi in lepidopteran insects, Karnataka College, Bidar India (February 2012)

- Probing insect response to nicotine by plant-mediated RNAi 10th IMPRS symposium Dornburg, Germany (February 2011)

- Detoxification of diterpenoid glycosides by *M. sexta* at Castle Ringberg Kreuth, Germany (February 2012)

## Poster presentations

- *Manduca sexta* larvae co-opt plant defense metabolite nicotine to deter spiders. Kumar P, Pandit S, and Baldwin IT
- 12th IMPRS Symposium, MPI for Chemical Ecology Jena, Germany (April 2013).

- Plant mediated RNA interference for the reverse genetics of a native insect herbivore in the field. Pandit S, Kumar P, Kessler D, and Baldwin IT, Scientific advisory board meeting, MPI for Chemical Ecology Jena, Germany (October 2012).

- *Manduca sexta*'s nicotine metabolism is influenced by the environment. Kumar P, Pandit S, and Baldwin IT. 11th IMPRS symposium, MPI for Chemical Ecology Dornburg, Germany (February 2012).

- Plant mediated RNA interference for insect gene silencing. Kumar P, Poosakkannu A, Pandit S, et al. Scientific advisory board meeting, MPI for Chemical Ecology Jena, Germany (October 2010).

- Sweet poison sours caterpillar's life. Kumar P, Pandit S, and Baldwin IT. 9th IMPRS symposium, MPI for Chemical Ecology Dornburg, Germany (February 2010).

## Conference

**Poster:** Identification and characterization of glutamate decarboxylase in sugarcane (*Saccharum officinarum* .L*)* var.co.740 under salt stress". Babu G, Kumar P and Naik G R, at International conference on **Plant genomics on biotechnology: Challenges and opportunities**. Indira Gandhi Agricultural University Raipur, India (October 2005).

## Workshop

**At MPI for Chemical Ecology Jena, Germany**

- Analysis of small molecules (January 2012)

- Advanced course on analytical chemistry (February 2011)

- Life after PhD; funding gates (March 2011)

- Advanced molecular cloning (November 2011)

- Proteomic insights into plant-insect interactions. Max-Planck society-India partnership program. NCL, Pune India (December 2006)

- Basic techniques in molecular biology and immunology at Institute of Biosciences and Molecular Biology (IBMB) and Bangalore Genei Pvt. Ltd., Bangalore, India (February 2005)