18 May 2018

Purva Kulkarni

P.Kulkarni@nioo.knaw.nl

Post-doctoral Researcher
Netherlands Institute for Ecology (NIOO-KNAW)
Work address: Droevendaalsesteeg 10 · 6708PB Wageningen · Netherlands

■ **Born**	May 10, 1987 in Indore, India
■ **Married**	December 10, 2013 to Kumar Saurabh Singh
■ **Language skills**	Marathi (native), Hindi (native), English (proficient), German (level A1)

1. Academic education and degrees

Ph.D. Friedrich Schiller University, January 2017, Bioinformatics
M.Sc. DAVV University, July 2011, Biochemistry
PGDB Institute of Bioinformatics and Applied Biotechnology (IBAB), April 2009, Bioinformatics
B.Sc. DAVV University, July 2007, Bioinformatics

2. Positions held

■ **Feb 2017 – Till date**	**Post-doctoral researcher** at NIOO-KNAW, Wageningen, NL
■ **Apr 2009 – Dec 2012**	**Bioinformatician** at PREMIER Biosoft International (India Office)**,** Indore, India

3. Research experience

■ **Post-doctoral researcher, NIOO-KNAW**

February 2017 – Till date
Development of a computational pipeline to analyze data from mass spectrometry imaging of ecological samples
Data analysis for several metabolomics-based projects and workflow establishment for analysis of high resolution GC-MS and DART data
2 months of NIOO-wide bioinformatics support

■ **Ph.D. researcher, Friedrich Schiller University and Max Planck for Chemical Ecology**

January 2013 – January 2017
Development of computational methods for mass spectrometry imaging (MSI) data
Working on developing methods for robust recalibration of MSI data
Developed a new lock-mass free recalibration method to correct mass shifts in MSI data using Java, R and Matlab. Improved existing recalibration method
Analyzed crystal formation patterns in Secondary Ion Mass Spectrometry (SIMS) data using R

■ **M.Sc. thesis, DAVV University**

October – December 2010
Worked on structural analysis of human milk oligosaccharides using MS/MS as Masters project. Conducted extensive analysis and comparison of available mass spectrometry data preprocessing methods

■ **PGDB industry internship, IBAB**

November 2008 – April 2009
Performed a study on monosaccharide chemistry, peracetylation and adduction
Analysis available glycan databases and studied their fragmentation patterns

■ **PGDB internal project, IBAB**

May – October 2008
Developed a method for proteomics data denoising using Octave and Matlab
Worked on micro array data analysis
Performed coding for algorithms such as K-means using Octave and implemented it in the developed microarray data clustering workflow

■ **Undergraduate thesis, DAVV University**

May – August 2007
Worked on High Performance Liquid Chromatography (HPLC)
Performed data acquisition of HPLC data for quantitative analysis of pharmaceutically relevant drug samples

4. Corporate experience

■ **Bioinformatician, PREMIER Biosoft International**

Technical team lead for the development of a software based on Mass Spectrometry Imaging - MALDIVision
Tasks involved feature analysis, algorithm development, work flow creation, writing use cases,

test cases and creation of functional GUI

Worked closely with the lead solution architect & core team of the companies like Waters®, Thermo Scientific and Agilent Technologies for the implementation of a database supported software based on lipid structural elucidation – SimLipid

Domain Expert for development of OligoArchitect™ – An online tool for primer and probe design solutions, a Sigma Aldrich® project

Team member for development of SimGlycan® - A MS data based glycan structure elucidation tool.
Tasks involved algorithm development, collecting glycan information from various sources and populating SimGlycan database, performing theoretical glycan cross ring fragmentation, calculating fragment masses and populating the same in SimGlycan database

Worked on custom design of oligos for PCR, RT-qPCR and microarrays assays for clients from prestigious organizations like NIH

Domain Expert for development of Simgene.com – A web Portal for open source Molecular Biology and Bioinformatics tools

Responsible for providing data analysis services for data obtained from glycomics labs

Beta testing, analysis and validation of software products in pipeline
Algorithm and code optimization for software products

Providing domain training to software engineers and coordinate with software development team to implement software features requested by clients

5. Leadership experience

- **Postdoctoral researcher, NIOO-KNAW**

  February 2017 – November 2017
  Coordinate seminars for the NIOO theme “Chemical communication” which includes presentation of scientific papers and giving demo on different metabolomics software.

- **Ph.D. researcher, Friedrich Schiller University**

  January 2013 – Till date
  Arrange and co-ordinate Journal Club, every week, during the semester
  Coordinate with the Masters students participating in the journal club for paper selection, presentation and abstract preparation for grading

- **M.Sc. student, DAVV University**

  December 2009 – January 2011
  Worked for preparing course material including laboratory experiments, lectures, exams, homework, and practice problems for B.Sc. students
  Led weekly problem-solving and discussion session for a groups of 15-25 students
  Conducted workshops for basic bioinformatics tools, sequence analysis, PCR and primer design for B.Sc. and 1st semester M.Sc. students

- **PGDB student, IBAB**

  February 2008
  Worked on organizing campaign for IBAB to be presented at Bangalore INDIA Bio 2008, Bengaluru, India. Managed IBAB booth at Bangalore INDIA Bio

6. Skills

- **Programming** — JAVA, C, Perl, SQL, Shell Scripting
- **IDE's** — Eclipse, MySQL Workbench, IntelliJ, Rstudio
- **Integrated software environment** — Matlab, R, Octave
- **Markup languages** — HTML, XML
- **Web/Application servers** — Apache, Tomcat 4.x/5.x
- **Operating systems** — Windows, Mac, Linux Ubuntu/Debian (for programming and application development)
- **Version control** — Git, Subversion

7. List of publications

2017

Kulkarni, P., Dost, M., Bulut, Ö. D., Welle, A., Böcker, S., Boland, W., Svatoš, A. Secondary ion mass spectrometry imaging and multivariate data analysis reveals co-aggregation patterns of Populus trichocarpa leaf surface compounds on micrometer scale. *Plant J.* 2018 Jan;93(1):193-206. DOI: 10.1111/tpj.13763

2016

Bartels, B., **Kulkarni, P.**, Danz, N., Böcker, S., Saluz, H. P., Svatoš, A. (2017). Mapping metabolites from rough terrain: laser ablation electrospray ionization on non-flat samples. *RSC Advances*, 7(15), 9045-9050. DOI: 10.1039/C6RA26854D

2015

Kulkarni, P., Kaftan, F., Kynast, P., Svatoš, A., Böcker, S., Correcting mass shifts: A lock mass-free recalibration procedure for mass spectrometry imaging data. *Anal Bioanal Chem*, 407(25): 7603-13. DOI: 10.1007/s00216-015-8935-4

2014

Kaftan, F., Vrkoslav, V., Kynast, P., **Kulkarni, P.**, Böcker, S., Cvačka, J., Knaden, M. and Svatoš, A. (2014), Mass spectrometry imaging of surface lipids on intact Drosophila melanogaster flies. *J. Mass Spectrom.*, 49: 223–232. DOI: 10.1002/jms.3331

Submitted

Kulkarni, P., Wilschut, R.A., Verhoeven, K.J.F, Putten, W.H.V.D., Garbeva, P. (2018), LAESI mass spectrometry imaging as a tool to differentiate the root metabolome of native and range-expanding plant species. *bioRxiv* 322867. *GigaScience*. DOI: 10.1101/322867

Wilschut, R.A., Putten, W.H.V.D., Garbeva, P., Harkes, P., Konings, W., **Kulkarni, P.**, Martens, H., Geisen, S., Root traits and root herbivores explain plant-soil feedback variation among congeners. *Nature Plants*

Kaftan, F., **Kulkarni, P.**, Böcker, S., Svatoš, A., Drosophila melanogaster chemical ecology revisited: 2-D distribution maps of sex pheromones on whole virgin and copulated flies by mass spectrometry imaging. *BMC Biology*

8. Selected awards and recognitions

- **2012** Best employee award, PREMIER Biosoft International (India Office)
- **2010** Meritorious student award during M.Sc., DAVV University
- **2008** Best scientific poster award at National conference on proteomics, genomics and systems biology, Bangalore
- **2007** Best academic student award during B.Sc., DAVV University

  University meritorious student award, DAVV University, for securing sixth position in the merit list for all stream of Bachelors degree

  Best all-round student award during B.Sc., DAVV University
- **2006** Creative excellence award during B.Sc., DAVV University

9. Travel awards and scholarships

- **2016** PhD support grant, Jena School of Microbial Communication, FSU in Jena, Germany
- **2014** Travel grant for EU-COST sponsored workshop on Imaging Mass Spectrometry Data Analysis, Sheffield Hallam University, Sheffield, United Kingdom
- **2013** Travel grant for EU-COST sponsored workshop on Mass Spectrometry Imaging Quantitation, University of Geneva, Geneva
- **2012** International Max Planck Research School fellowship to undertake Ph.D. at the

	IMPRS, MPI-CE in Jena, Germany
■ **2007**	University meritorious student scholarship, DAVV University, Indore, India
■ **2006**	University meritorious student scholarship, DAVV University, Indore, India

10. Conferences and symposiums attended

P Poster T Talk A Attendee C Coauthor

■ **2018**	T	Chemical Communication Mini-Symposium, NIOO-KNAW, Wageningen, Netherlands
■ **2017**	P T	NIOO-KNAW Research days, Wageningen, Netherlands
	P	Metabolomics Conference, Brisbane, Australia
■ **2016**	T	Workshop on Metabolomics in Chemical Ecology, Wageningen, Netherlands
	C T	OurCon IV, Imaging Mass Spectrometry Conference, Ustron, Poland
	C P	International mass spectrometry conference, Toronto, Canada
	A	15th IMPRS Symposium, MPI for Chemical Ecology, Dornburg, Germany
■ **2015**	T	OurCon III, Imaging Mass Spectrometry Conference, Pisa, Italy
	P	Central German Meeting on Bioinformatics, Halle, Germany
	C P	48th Jahrestagung der Deutschen Gesellschaft für Massenspektrometrie (DGMS), Deutschen Gesellschaft für Massenspektrometrie (DGMS), Wuppertal, Germany
	T	14th IMPRS Symposium, MPI for Chemical Ecology, Dornburg, Germany
■ **2014**	P	OurCon II, Imaging Mass Spectrometry Conference, Antalya, Turkey
	P	American Society of Mass Spectrometry Annual Conference, Baltimore, United States of America
	C P	47th Jahrestagung der Deutschen Gesellschaft für Massenspektrometrie (DGMS), Deutschen Gesellschaft für Massenspektrometrie (DGMS), Frankfurt, Germany
	P	13th IMPRS Symposium, MPI for Chemical Ecology, Dornburg, Germany
■ **2013**	A	21st Annual International Conference on Intelligent Systems for Molecular Biology and the 14th European Conference on Computational Biology (ISMB/ECCB), Berlin, Germany
	P	12th IMPRS Symposium, MPI for Chemical Ecology, Dornburg, Germany
■ **2008**	P	Bangalore INDIA Bio, Bengaluru, India
	P	National conference on proteomics, genomics and systems biology, Bangalore, India

11. Scientific courses and workshops attended

■ **2017**	EMBO Practical Course on Metabolomics Bioinformatics for Life Scientists, Cambridge, United Kingdom

■ **2016**	IMPRS workshop on Grant Proposal Writing
■ **2015**	Jena Graduate Academy: Scientific Presentations, Jena, Germany Professional Job Application for PhD Students, Jena, Germany Jena Graduate Academy: Linear Regression Modeling in R, Jena, Germany
■ **2014**	1st EU-COST course on Imaging Mass Spectrometry Data Analysis, Sheffield, United Kingdom
■ **2013**	Jena Graduate Academy: Working with Matlab, Jena, Germany Jena Graduate Academy: Understanding Statistics - A primer for Natural Scientists, Jena, Germany Jena Graduate Academy: The type setting system LaTeX, Jena, Germany Jena Center for Bioinformatics Workshop “Bioinformatics meets Biodiversity”, Jena, Germany Fundamentals of Mass Spectrometry Workshop, Jena, Germany Computational methods for metabolite mass spectrometry workshop, Jena, Germany EU-COST course on mass spectrometry imaging quantitation, Geneva, Switzerland
■ **2009**	Modular course in Genome and Gene Expression Analysis, Institute of Bioinformatics and Applied Biotechnology (IBAB), Bengaluru, India. Modular course in Systems Biology, Institute of Bioinformatics and Applied Biotechnology (IBAB), Bengaluru, India. Modular course in Cheminformatics, Institute of Bioinformatics and Applied Biotechnology (IBAB), Bengaluru, India.
■ **2007**	Workshop on Computational Genome Analysis, Center for Development of Advanced Computing (C-DAC), Pune, India. National Workshop on Computational Genomics, Birla Institute of Scientific Research (BISR), Jaipur, India.

Declaration

I hereby declare that all the information provided by me in this curriculum vitae is factual and correct to the best of my knowledge and belief.