

SARATH CHANDRA JANGA

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Educational background

2007-till date	Phd student in Molecular Systems Biology at MRC- Laboratory of Molecular Biology, Darwin College, University of Cambridge, UK	Understanding transcriptional regulation in prokaryotic and eukaryotic organisms - Submitted three manuscripts - Organizing committee member of two conferences
10/2003-10/2007	Full time Researcher Center for Genomic Sciences, UNAM, Mexico	Understanding the structure, organization and evolution of transcriptional regulation in bacterial genomes - Published over 15 research manuscripts - Invited Visiting Scholar to MRC Lab of Molecular Biology, Cambridge, UK; University of KLeuven, Leuven, Belgium ; Banting and Best Dept. of Medical Research, CCBR, U. Toronto, Canada ; Dept. of Biology, Wilfred Laurier University, Waterloo, Canada
05/2002-08/2002	Fully funded Summer Internship Center for Genomic Sciences, UNAM, Mexico	Research Project to understand the gene regulation in bacteria - Published a work in Nucleic Acids Research as an undergraduate and was subsequently offered a researcher position
05/2001-08/2001 & 08/2003-10/2003	Fully funded Summer Internship Decodon GmbH, Germany Full time Computational Biologist Decodon GmbH, Germany	Developed a java based platform by integrating genomic and 2D gel experimental data for large scale analysis - Immediately offered a full time job based on performance during internship
1998-2003	Indian Institute of Technology, New Delhi, India	Bachelors and Masters in Technology, Bio-chemical Engineering and Biotechnology CGPA : 6.857 Relative GPA: 8.26 - Full fellowship from Dept. of Biotechnology, Govt. of India for Masters degree based on GATE score - ICGEB funding for undergraduate research - CCMB funding for a research project (one month) - Rated as the best project for Masters research thesis and won the best poster award in the National Conference for Biochemical Engineers and Biotechnologists.
1998	Indian Institute of Technology Joint Entrance Examination (IIT-JEE)	Admission into IIT for engineering studies. Only the top 1% of students from over 200,000 applicants all over India are selected
1998	Board of Secondary Education, Andhra Pradesh, India	Awarded distinction securing 100% marks in Mathematics, Chemistry and Physics. - Ranked #32 and #16 in the state (of ~8000 candidates) in the Maths and Chemistry Talent Search Exam

Awards and honors (11 + several as an undergraduate)

- Cambridge Commonwealth Trust scholarship for doctoral work at Cambridge University 2007-2010
- ISCB travel Awards - \$900 (ISMB 2006, Brazil), \$500 (RECOMB 2005, USA) and \$1600 (ISMB 2004, England)
- Outstanding contribution to the ISCB-Student Council activities \$750 for 2004-05
- ECCB travel Award € 600 (ECCB 2005, Spain)
- Burroughs Wellcome Fund & NIGMS Travel fellowship \$500 (ICSB, International Conference on Systems Biology 2005, USA)
- Selected and listed in the 2007-2008 edition of International WHO'S WHO of Professionals
- Nominated to the International WHO'S WHO of Science and Engineering
- International Center for Genetic Engineering & Biotechnology (ICGEB), New Delhi funding for undergraduate research of INR 10,000 from Oct-Nov 2000
- Center for Cellular & Molecular Biology (CCMB), Hyderabad support of INR 1500 for a short project in Dec 1999
- Obtained various awards both academic and non-academic at school and college level including the selection to the regional Mathematics Olympiad in 10th grade
- Secured 89% in GATE and was offered full funding for the Masters course

Teaching experience

- Courses taught: *Introduction to Bioinformatics* (Genome annotation/ Comparative and Functional Genomics at Center for Genomic Sciences for B.S students)
- Invited to organize a tutorial on "Prediction and evolution of transcription factors in prokaryotes" at BioSysBio conference, Manchester, 2007
- Invited to give (Teleconference-based) lecture series on "Gene regulation in prokaryotic organisms" for International Center for Chemical and Biological Sciences (ICCS), University of Karachi, Pakistan, September 2007.

Professional societies and organizations

- Member of All India Biotechnology Association
- Member of the International Society for computational Biology (ISCB)
- One of the founding members of International Society for Computational Biology-Student Council (ISCBSC)
- Currently Vice-Chair of ISCBSC (2005-till date)

Invited talks/workshops, conferences and seminars (32)

- (Invited talk) "Genome organization and transcriptional regulation in bacteria and eukarya: Insights from model systems" at European Bioinformatics Institute (EBI), Hinxton, UK, February 2008.
- (Invited talk) "Structure and complexity of transcriptional regulatory networks in prokarya and eukarya" at the International Center for Genetic Engineering and Biotechnology (ICGEB), New Delhi, India, February 2008.
- (Invited talk) "Constraints imposed by transcriptional regulation on genome organization: Principles and insights from model systems" at Center for DNA Fingerprinting and Drug design (CDFD), Hyderabad, India, February 2008.
- (Invited talk) "Constraints imposed by transcriptional regulation on genome organization: Principles and insights from model systems" at Department of Biotechnology, University of Hyderabad, Hyderabad, India, January 2008.
- (Invited talk) "Genome organization and transcriptional regulation in bacteria and eukarya: Principles and insights from model systems" at Center for Cellular and Molecular Biology, Hyderabad, India, January 2008.
- (Invited talk) "Genome structure and transcriptional regulatory networks in prokarya and eukarya: Insights from model organisms" at Center for Research and Advanced Studies, IPN, Irapuato, Mexico, September 2007.
- (Invited talk) "Gene regulation in prokaryotic organisms- recent advances and genomic perspectives" Teleconference talk for International Center for Chemical and Biological Sciences (ICCS), University of Karachi, Pakistan, September 2007.
- (Invited talk) "Regulatory plasticity and complexity in prokaryotes: From Operons to Regulons" at Center for Computational Systems Biology, University of KLeuven, Leuven, Belgium June 2007.
- (Invited talk) "Genome context methods and protein-protein interactions in the model bacterium *Escherichia coli*: Is there any overlap?" at Center for Cellular and Biomolecular Research, U. Toronto, Canada April 2007.
- (Invited talk) "Operon structure in prokaryotes: exploiting their plasticity for function inference" at MRC-Laboratory of Molecular Biology, Cambridge, U.K February 2007.
- (Invited talk) "Gene regulation, Transcriptional networks and beyond; what do we understand after 300+ prokaryotic genomes at hand?" at the National Laboratory for Scientific Computing (LNCC), Petropolis, Brazil August 2006.
- (Invited talk) "Comparative aspects of transcriptional regulation in Prokarya" at Nucleo de Genomica e Bioinformatics (NUGEN), Universidade Estadual do Ceara, Brazil, August 2006.
- (Invited talk) "Comparative and Functional Genomics in Prokaryotes – advantages for genome annotation and analysis" at Parasitology research center, Childrens Hospital in Mexico city, April 2006 as part of Genomics and Bioinformatics Course.
- (Invited talk) "Gene regulation in prokarya: Lessons learned from the model organism" at the School of Computer Science, University of Waterloo, Canada, August 2005.

- Presented poster at the 9th International Conference on Research in Computational Molecular Biology (RECOMB-05) at Cambridge, MA, May 2005.
- (Invited talk) “Operon prediction in Microbial Genomes” at Regional Research Laboratory, Trivandrum, India 2004.
- European Conferences on Computational Biology held at France (2003) and United Kingdom (2004)
- International Conferences on Intelligent Systems for Molecular Biology (ISMB) held at Canada (2002), United Kingdom (2004), USA (2005), Brazil (2006) and Austria (2007).
- (Invited) to attend the Dagstuhl Seminar on “Integrative Bioinformatics and Virtual Aspects of the Cell” 4-9th July, 2004 Dagstuhl, Saarland, Germany.
- (Invited) volunteer to help at ISMB-2002(Intelligent Systems for Molecular Biology) at Edmonton, Canada.
- (Invited) with complete funding for "South East Asian Training Course on Bioinformatics Applied to Tropical Diseases" sponsored by UNDP/World bank/WHO Special Programme for Research and Training in tropical diseases (2002) ICGEB , New Delhi.
- National Conference on Biotechnology -the Science and the Business organized jointly by All India Biotech. Association and Indian Institute of Technology, Delhi (2001)
- Organizing committee member of the national level symposium Biohorizon in the years 1999, 2000, 2001, 2002 and 2003 held at New Delhi-India.

Current research interests

- Understanding gene regulatory mechanisms in eukaryotic organisms.
- Evolution, prediction and organization of operons and regulons in prokaryotes.
- Understanding gene regulatory networks and their general topological properties in prokaryotes.
- Functional relationships between gene products to improve annotation strategies using genomic context.
- Integrating diverse kinds of biological interaction datasets like protein-protein, regulatory and signal transduction pathways to understand systems level aspects of regulation.

Peer reviewer for journals/conferences (15)

- Program chair for the Third International Student Council Symposium at ISMB (2007, Austria)
- Program chair for the Second International Student Council Symposium at ISMB (2006, Brazil)
- Organizing and Review committee member of Biosysbio (Bioinformatics, Synthetic and Systems Biology conference) (2007, U.K)
- First Canadian Student Conference on Biomedical Computing (CSCBC) (2006, Canada)
- IEEE Computational Systems Bioinformatics conference (2005, USA)
- First International Students Symposium at ECCB, Madrid (2005, Spain)
- Nucleic Acids Research
- Bioinformatics
- BMC Systems Biology
- FEBS letters
- Genome Biology
- Journal of Biotechnology
- Journal of Molecular Biology
- Bioinformation
- Reviewed grants for Czech Science Foundation.

Publications (25 = 15 published + 6 under review + 4 in preparation/submission)

*indicates corresponding author either jointly or alone

† indicates joint first author

- Conservation of adjacency as evidence of paralogous operons
Sarath Chandra Janga and Gabriel Moreno-Hagelsieb
Nucleic Acids Research, 2004 Vol.32, No. 18, 5392-5397
- Nebulon: a system for the inference of functional relationships of gene products from the rearrangement of predicted operons
Sarath Chandra Janga, Julio Collado-Vides and Gabriel Moreno-Hagelsieb
Nucleic Acids Research, 2005 Vol.33, No. 8, 2521-2530
- The network of transcriptional interactions imposes linear constraints in the genome
Ricardo Menchaca-Mendez[†], **Sarath Chandra Janga**[†] and Julio Collado-Vides
OMICS: A Journal of Integrative Biology Jun 2005, Vol.9, No. 2: 139-145
- Internal sensing machinery directs the activity of the regulatory network in *Escherichia coli*
Agustino Martínez-Antonio, **Sarath Chandra Janga**[†], Heladia Salgado and Julio Collado-Vides
Trends in Microbiology, 2006 Vol.14, No. 1, 22-27
- The Partitioned *Rhizobium etli* Genome: Genetic and Metabolic Redundancy in Seven Interacting Replicons
Víctor González, Rosa I. Santamaría, Patricia Bustos, Ismael Hernández-González, Arturo Medrano-Soto, Gabriel Moreno-Hagelsieb, **Sarath Chandra Janga**, Miguel A. Ramírez, Verónica Jiménez-Jacinto, Julio Collado-Vides and Guillermo Dávila

- *Proc. Natl. Acad. Sci. U S A.* 103(10): 3834-9, 2006
- Operons and the effect of genome redundancy in deciphering functional relationships using phylogenetic profiles
Gabriel Moreno-Hagelsieb and **Sarath Chandra Janga**
Proteins: Structure, Function, and Bioinformatics, 70(2):344-352, 2007
- The distinctive signatures of promoter regions and operon junctions across Prokaryotes
Sarath Chandra Janga*, Warren F. Lamboy, Araceli M. Huerta and Gabriel Moreno-Hagelsieb
Nucleic Acids Research, 2006 Vol.34, No. 14, 3980-3987
- Bacterial regulatory networks are extremely flexible in evolution
Irma Lozada-Chávez, **Sarath Chandra Janga*** and Julio Collado-Vides
Nucleic Acids Research, 2006 Vol.34, No. 12, 3434-3445
+Featured in the list of hot research papers on NAR website
- Identification and analysis of DNA-binding Transcription Factors in Bacillus subtilis and other Firmicutes- A genomic approach
Samadhi Moreno-Campuzano, **Sarath Chandra Janga** and Ernesto Perez-Rueda
BMC Genomics. 2006 Jun 13;7(1):147
+Accessed over 800 times in less than 5 months according to BMC report
- Prediction and evolution of transcription factors and their evolutionary families in prokaryotes
Sarath Chandra Janga*
BMC Systems Biology, 2007, 1(Suppl 1):P3 (tutorial presentation as part of the proceedings of the BioSysBio conference)
- Internal versus external effector and transcription factor gene pairs differ in their relative chromosomal position in *Escherichia coli*.
Sarath Chandra Janga*, Heladia Salgado, Julio Collado-Vides and Agustino Martinez-Antonio
Journal of Molecular Biology, 2007 Vol. 368(1):263-72
- Comparison of TF families in two model organisms reveals a lineage specific-expansion of transcriptional regulatory machinery
Sarath Chandra Janga* and Ernesto Perez-Rueda
(Under review at *Journal of Molecular Evolution*)
- Conservation of Transcriptional Sensing Systems in prokaryota: A perspective from *Escherichia coli*
Heladia Salgado, Agustino Martinez-Antonio and **Sarath Chandra Janga***
Febs letters, 2007 Vol. 581:3499-3506
- Operome: A comprehensive resource of predicted operon structures in complete prokaryotic genomes
Sarath Chandra Janga*, Juan Segura-Salazar and Gabriel Moreno-Hagelsieb
Submitted to *Genome Biology*
- Prokaryotic transcription factors are preferentially encoded as monocistronic units
Sarath Chandra Janga* and Gabriel Moreno-Hagelsieb
(In Preparation)
- Structure and evolution of gene regulatory networks in microbial genomes
Sarath Chandra Janga* and Julio Collado-Vides
Research in Microbiology, 2007 158(10):787-94
+Featured on the cover page of the issue & selected as journals' representative image
- Functional Atlas of the Uncharacterized Protein Repertoire of *Escherichia coli*
Pingzhao Hu[†], **Sarath Chandra Janga†**, Gareth Butland[†] et.al, Submitted to *Cell*, 2008
- Evidence for the influence of nuclear organization in the organization of genes in eukaryotic chromosomes
Sarath Chandra Janga*, Julio Collado-Vides and M. Madan Babu
Submitted to *Nature Genetics*, 2008
- Co-ordination logic of sensing machinery in the transcriptional regulatory network of *Escherichia coli*
Sarath Chandra Janga*, Heladia Salgado, Agustino Martinez-Antonio and Julio Collado-Vides
Nucleic Acids Research, 2007 Vol.35, No. 20, 6963-6972
- Scale-free transcriptional regulatory network: is it encoded in the genome ?
Sarath Chandra Janga*, Heladia Salgado and Agustino Martinez-Antonio
Submitted to *Trends in Genetics*
- Functional organization of *E. coli* transcriptional regulatory network
Agustino Martinez-Antonio, **Sarath Chandra Janga** and Denis Thieffry
Submitted to *Journal of Molecular Biology*, 2008
- Highlights from the Third International Society for Computational Biology Student Council Symposium
Nils Gehlenborg, Manuel Corpas and **Sarath Chandra Janga***
BMC Bioinformatics 2007, 8(Suppl 8):11
- Ten simple rules for organising a successful scientific conference
Manuel Corpas, Nils Gehlenborg and **Sarath Chandra Janga**
PLoS Computational Biology. 2008 (Submitted)
- Combinatorial control and relative genome organization of transcription factors in bacterial regulatory networks
Sarath Chandra Janga*, Heladia Salgado and Agustino Martinez-Antonio
Journal of Molecular Biology, 2008 (submitted)
- Regulation and interplay of sigma and anti-sigma factors in *Escherichia coli*
Luis Treviño-Quintanilla, Heladia Salgado, Irma Martinez-Flores, Julio Collado-Vides and **Sarath Chandra Janga***
Trends in Genetics, (to be submitted)

Book chapters (1)

- **Sarath Chandra Janga*** and M. Madan Babu
Invited book chapter on transcriptional regulatory networks for **Cambridge University Press** (Ed: Michele Vendruscolo, Department of Chemistry, University of Cambridge)

Posters presented (11)

- *Intelligent Systems for Molecular Biology (ISMB) (2006)* “Plasticity of transcriptional regulatory machinery revealed from a comparison of complete regulatory repertoires.”
- *International Conference on Systems Biology (ICSB) (2005)* “Understanding operon recombinations in multi-replicon genomes: A perspective from *Rhizobium etli*.”
- *International Conference on Systems Biology (ICSB) (2005)* “Internal Sensing Machinery directs the activity of the regulatory network in *Escherichia coli*.”
- *Arrowhead Conference, California, September 2004 & ISMB (2005)* “Nebulon: a system for the inference of functional relationships of gene products from the recombination of predicted operons”
- *RECOMB (2005)* “No evidence for relation between co-regulation and transcriptional regulatory interactions in the evolution of regulatory networks.”
- *6th European Nitrogen Fixation Conference (2004)* “The Complete Genome Sequence of *Rhizobium etli*.”
- *Intelligent Systems for Molecular Biology (ISMB) (2004)* “Gene Ontology Network of Interactions among Operons in *E.coli* and *B.subtilis*”
- *Intelligent Systems for Molecular Biology (ISMB) (2004)* “Finding modules using network motifs as building blocks”
- *Intelligent Systems for Molecular Biology (ISMB) (2004)* “Inference of Biological Modules in *Escherichia coli* Regulatory Network.”
- *HUGO Human Genome Meeting, Cancun, Mexico (2003)* “A Study of Paralogous Operons“
- *Biohorizon 2003, India* “Gene Order Conservation in *S.cerevisiae*” (adjudged the best poster)

Professional and Technical Skills

- Expertise in Perl, Java, C++, Php, C, Fortran, Xml, Pascal, Sml and Matlab, Gnuplot, R (statistical package)
- Extensive experience on all major operating systems - Windows, Linux, Solaris and on Cluster systems for computationally intensive operations
- Experienced in software development on commercial object oriented databases like Cache and relational databases like Oracle and MySQL
- Developed websites using Html, Php, Javascript, Java and Softwares like Paintshop pro and Photoshop

Invited short research visits and work experience (11)

- Researcher at **Program of Computational Genomics, Center for Genomic Sciences, UNAM** (11/2003-10/2007)
- Visiting Scholar to **Department of Microbial and Molecular System, Center for Microbial and Plant Genetics, University of Kleuven, Leuven, Belgium** (05/2007-07/2007)
- Visiting Research Fellow to the **Banting and Best Department of Medical Research, Faculty of Medicine, University of Toronto, Toronto, Canada** (03/2007-04/2007)
- Visiting Scholar to **Structural Studies Division at MRC-Laboratory of Molecular Biology, University of Cambridge, Cambridge, UK** (12/2006-03/2007)
- Visiting Researcher to **Department of Biology, Wilfrid Laurier University, Canada** (07-08/2005)
- Computational Biologist at **Decodon GmbH, Germany** (08-10/2003)
- Masters thesis work (08/2002-05/2003) on “Gene order conservation in Eukarya with *S.cerevisiae* as a model organism” under the supervision of Prof.G.P.Agarwal (**Dept. of Bio-chemical Engg. and Biotechnology, IIT Delhi**)
- Summer internship at **Center for Genomic Sciences, UNAM, Mexico** (05/2002-08/2002) with Dr. Gabriel Moreno-Hagelsieb
- Short-term project at **ICGEB (International Center for Genetic Engg. and Biotechnology), New Delhi** (11/2002-01/2003)
- Summer internship at **Decodon GmbH, Germany** (05-08/2001) on developing “A java-based platform for automated comparison of bacterial genomes” with outstanding performance which subsequently resulted in offering of job
- Oracle system administrator for the software firm **Akhila institute of information technology and NIIT** as a part time job (05-08/1999)

Referees

1. Dr. M. Madan Babu, MRC Laboratory of Molecular Biology, UK, madanm@mrc-lmb.cam.ac.uk
2. Prof. Gabriel Moreno-Hagelsieb, SHARCNET chair in Biocomputing, WL University, Canada, gmoreno@wlu.ca
3. Prof. Julio Collado-Vides, Director, Center for Genomic Sciences, UNAM, Mexico, collado@cgc.unam.mx
4. Prof. Andrew Emili, Donnelly Centre for Cellular and Biomolecular Research, U. Toronto, Canada, andrew.emili@utoronto.ca
5. Dr. Kathleen Marchal, University of KLeuven, Belgium, kathleen.marchal@biw.kuleuven.be
6. Dr. Victor Gonzalez, Molecular Evolution Group, Center for Genomic Sciences, UNAM, Mexico, vgonzal@cgc.unam.mx