

# Sayane Shome

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## Education

2015 – present **Ph.D. Bioinformatics and Computational Biology**, Iowa State University, Iowa, USA.

Advisor Dr. Robert L. Jernigan

Current Research

1. Understanding the biological mechanisms in various membrane transporters, transmembrane proteins using computational approaches.
2. miRNA-seq data analysis of milk samples obtained from cows and finding miRNAs and other RNAs significant for immune response and growth.

2009-13 **Bachelors of Technology, Bioinformatics**, Vellore Institute of Technology, Vellore, India.

## Work Experience

- March 2015 **Project Intern**, ADITYA BIOTECH LAB RESEARCH PVT. LTD, Raipur, India.  
–May 2015 Computational analysis on phenotypic characterization of genomic variants observed in FRO1 gene in *Oryza sativa* crop. In addition, we performed structure prediction via Modeller software and molecular docking studies on coat protein of Okra enation Leaf Curl virus.
- Aug 2014 **Intern**, BIOINFORMATICS CENTRE SUB-DIC, NIT RAIPUR, Raipur, India.  
–Nov 2014 Worked on Next Generation Sequencing data analysis of human genomic data from different populations originating from Indian subcontinent.
- July 2013 **External Student Researcher**, FCITR, KING ABDULAZIZ UNIVERSITY OF SCIENCE AND TECHNOLOGY, Rabigh, Saudi Arabia.  
–May 2015 Worked on ongoing projects related to genomics, high throughput data analysis and drug design under the guidance of Dr. Iftikhar Aslam Tayubi.
- July 2013 **Project Trainee**, INSTITUTE OF STATISTICAL SCIENCES, ACADEMIA SINICA, Taipei, Taiwan.  
–Aug 2013 Worked on predicting transcriptional interactions between gene pairs using time-regulated microarray gene expression data from medullablastoma patients.
- June 2012 **Summer Intern**, BOTANICAL SURVEY OF INDIA, Kolkata, India.  
–July 2012 Worked as an intern in IT Division on Implementation of Leaf Recognition System using PCA via Matlab.
- Sept 2011 **Intern**, XCODE LIFESCIENCES, VIT-TECHNOLOGY BUSINESS INCUBATOR, Vellore, India.  
–Dec 2011 Worked on collection of SNPS related to hereditary traits and disease risks like diabetes, cardiac arrest etc from various databases including GWAS, dbSNP, SNPedia and calculated the risk probability for the genotype and phenotypic composition.

## Teaching Experience

- Fall 2018 **Instructor, Homology Modelling and Molecular Docking (2-class tutorial session), BCB 569**, IOWA STATE UNIVERSITY, Ames, Iowa, USA.
- Fall 2017, **Instructor, Steered Molecular Dynamics (2-class tutorial session), BBMB 551**,  
Fall 2016 IOWA STATE UNIVERSITY, Ames, Iowa.
- 2017 **Volunteer, BCBGSO projects**, IOWA STATE UNIVERSITY, Ames, Iowa, USA.  
Mentored a undergraduate student on her project, 'Detection of transposable elements in genome sequence data from corn plants', Iowa State University
- Fall 2016 **Teaching Assistant, CHEM177 (General Chemistry I)**, IOWA STATE UNIVERSITY, Ames, Iowa, USA.
- March 2014 **Virtual Classroom Trainer**, FCITR, KING ABDULAZIZ UNIVERSITY OF SCIENCE  
–May 2015 AND TECHNOLOGY, Rabigh, Saudi Arabia.

## Virtual Project Experience

- 2012-2013 Advisor: Dr. Sona Vasudevan, Georgetown University, Washington DC, USA  
Project Title Synbio app selector: Web application comprising of synthetic biology softwares

## Publications

1. M Hassan, A Namasivayam, D DeBlasio, N Fatima, B Siranosian, RG Parra, B Cuypers, S Shome, A M Monzon, J Fumey and F Rahman (2018) Reflections on a journey: a retrospective of the ISCB Student Council symposium series; BMC Bioinformatics 2018 19(Suppl 12):347.
2. ED Testroet, S Shome, J Reecy, RL Jernigan, M Zhu, M Du, S Clark, DC Beitz (2017) Profiling of the Exosomal Cargo of Bovine Milk Reveals the Presence of Immune- and Growth-modulatory non-coding RNAs (ncRNA); Iowa State University Animal Industry Report 2017.
3. CN Rafael, E Ashano, Y Moosa, S Shome, D DeBlasio (2017) Highlights of the second ISCB Student Council Symposium in Africa, 2017. DOI: 10.12688/f1000research.13463.1
4. IA Tayubi, S Shome (2017) Computational Analysis of Non-Synonymous SNPs Associated with Ephrin Receptor B2 Gene and Implication in Various Signaling Pathways: A Molecular Dynamics Approach. Current Bioinformatics, February 2017. DOI: 10.2174/1574893612666170203164538.
5. S Shome et al (2016) ISCB-Student Council Narratives: Strategic development of the ISCB-Regional Student Groups in 2016. F1000 Research 5:2882, December 2016. DOI: 10.12688/f1000research.10420.1.
6. IA Tayubi, S Shome, HAS Abujabal (2016) Computationally designed novel drug for the regulation of protein expression levels of BCL-2 family. Int. J. Computational Biology and Drug Design. DOI: <http://dx.doi.org/10.1504/IJCBDD.2016.078285>.
7. RK Meena, S Shome, S Thakur (2016) Prediction of Phenotypic Effects of Variants Observed in LOC-Os04g36720 of FRO1 Gene in Rice (*Oryza sativa* L.); Interdisciplinary Sciences Computational Life Sciences. DOI: 10.1007/s12539-016-0152-0.
8. EAO Cruz, S Shome, E M Battaglia, M Yelleswarapu, J K Gupta, P Cardenas, A Ngom, P L. Fernandes, and G Moe-Behrens (2015) Bioinformatics for Aspiring Synthetic Biologists. BioCoder (Spring 2015 issue), O'Reilly Publications.
9. P Cardenas, M Yelleswarapu, S Shome, J K Gupta, E M Battaglia, P Fernandes, A Ngom, and G Moe-Behrens (2014) Leukippos: A Synthetic Biology Lab in the Cloud. BioCoder (Summer 2014 issue), O'Reilly Publications.

10. IA Tayubi, S Shome and S Hashmi (2014) Drug formulation studies on regulation of BCL-2 family for treatment of Autism. *BMC Genomics*, 15 (Suppl 2):P38 DOI: 10.1186/1471-2164-15-S2-P38.
11. IA Tayubi, S Shome and OM Barukab (2014) In silico analysis of detrimental mutation in EPHB2 gene causing Alzheimer's disease. *BMC Genomics*, 15 (Suppl 2):P46 DOI:10.1186/1471-2164-15-S2-P46.
12. Fatumo S, Shome S, Macintyre G (2014) Workshops: A Great Way to Enhance and Supplement a Degree. *PLoS Comput Biol* 10(2): e1003497. DOI:10.1371/journal.pcbi.1003497.

## Manuscripts in preparation

1. Understanding transport pathways in membrane transporters via Computational approaches.
2. Profiling of the Exosomal Cargo of Bovine Milk Reveals the Presence of Immune- and Growth-modulatory ncRNAs.

## Posters

1. Investigation of e-cadherins interactions, both cis and trans with simulations. S Shome, S Sivasankar, R L Jernigan. 5th Midwest Single Molecule Workshop, Iowa State University, Ames, IA, July 30-31, 2018.
2. Transport pathways in membrane transporters. S Shome, E Yu, R.L.Jernigan. GPSRC, Iowa State University, Ames. April 11, 2018.
3. Profiling of the Exosomal Cargo of Bovine Milk Reveals the Presence of Immune- and Growth-modulatory ncRNAs. ED Testroet, S Shome et al. Experimental Biology 2018 Meeting; The FASEB Journal 2018 32:1 supplement, 747.25-747.25.
4. ISCB Student Council Regional Student Groups: Connecting young computational biologists around the world. S Shome et al, ISMB 2017, Prague, July 21-25, 2017.
5. Tracing transport pathways in membrane transporters. S Shome et al, ISMB 2017, Prague, July 21-25, 2017.
6. Studying phenotypic impact of non-synonymous single nucleotide variants in *Oryza sativa*. ISMB-Student Council Symposium 2016, Orlando, Florida; DOI: 10.7490/f1000research.1113109.1.
7. SynBio App Selector: An Application Selection Engine for Synthetic Biology. S Shome, P Cardenas, P Fernandes, G Moe-Behrens and A Ngom. IWBD 2013, Imperial College, London, July 12-13, 2013.
8. SynBrick: A Crowdsourcing Game for Synthetic Biology. P Cardenas, S Shome, P Fernandes, G MoeBehrens and A Ngom. IWBD 2013, Imperial College, London, July 12-13, 2013.
9. Structure prediction and modeling studies of brain-specific angiogenesis inhibitor 1. S Shome, T Sharma, N Arora. ISMB 2012, 15 - 17 Jul 2012, W12.
10. Comparative interaction analysis of cholinesterase inhibitors with Ethephon. S Shome. National Conference on Computational Biology and Chemistry, VIT University, Vellore (November 2011).

## Talks

1. Tracing transport pathways in membrane transporters. BCBGSO Symposium, Iowa State University; March 30, 2018.
2. Transport Pathways in Membrane Transporters. Molecular Dynamics Session-I, Biophysical Society Annual Meeting 2018, San Francisco, CA; February 19, 2018.

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## Science Communication

- 2018,2017 **Judging panel member**, ISCB WIKIPEDIA COMPETITION.
- 2018 **Science Communication Fellow**, REIMANN GARDENS,IOWA STATE UNIVERSITY, Ames,Iowa,USA.
- July 2018 **Science Writer**, ISCB FELLOWS WORKSHOP,ISMB 2018, Prague,Czech Republic.
- 2016 – 2017 **Senior Blogger**, PLOS COMPUTATIONAL BIOLOGY FIELD REPORTS.

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## Insitutional Experience

- 2018 – present **BCB Department Senator and Member of University Relations and Affairs Committee**, GRADUATE AND PROFESSIONAL STUDENTS SENATE,IOWA STATE UNIVERSITY , Ames,Iowa,USA.
- 2018 **Student Mentor**, BIOINFORMATICS AND COMPUTATIONAL BIOLOGY PROGRAM,IOWA STATE UNIVERSITY, Ames,Iowa,USA.
- Aug 2016 –May 2017 **Director of Research Consulting**, BCB GRADUATE STUDENTS ORGANISATION,IOWA STATE UNIVERSITY, Ames,Iowa,USA.  
1.Facilitated communication for inviting bioinformatics related project proposals from professors at the university for BCB department students.  
2.One of the organisers at the Annual BCBGSO Symposium 2017.
- 2012-13 **Creative head**, ENERGY AND ENVIRONMENT PROTECTION CLUB,VIT UNIVERSITY, Vellore,India.
- August 2012 **Coordinator**, NATIONAL WORKSHOP ON GENOMICS AND DRUG DESIGNING,VIT UNIVERSITY, Vellore,India.

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## Professional Experience

- 2018 **Co-chair,Platform Session : Molecular Dynamics Session-I**, BIOPHYSICAL SOCIETY ANNUAL MEETING , San Francisco,USA.
- 2018, 2017,2013 **Organizing Team Member, Student Council Symposium**, ANNUAL ISCB MEETING : INTELLIGENT SYSTEMS FOR MOLECULAR BIOLOGY, Chicago(USA),Prague(Czech Republic),Berlin(Germany).
- 2017 **Organizing Team Member, Student Council Symposium-Africa**, ISCB AFRICA ASBCB CONFERENCE ON BIOINFORMATICS 2017, Entebbe,Uganda.
- Dec 2015– present **Chair, RSG Committee and Executive team member,International Society of Computational Biology-Student Council** , ISCB.  
1.Managing 30 RSGs (Regional student groups) around the world and expanding further to new regions to promote networking amongst computational biology student researchers.  
2.Formulated virtual seminar series program, encouraging researchers to present their research via virtual platform.  
3.Contributing in various initiatives of Student Council such as devising banners, flyers etc.
- 2015 –present **Guest Editor**, F1000 CHANNEL, ISCB-Student Council.
- 2014 **Reviewer**, ISMB-SCS 2014 TRAVEL FELLOWSHIP PROGRAM.
- 2014 **Reviewer**, ISCB-SC INTERNSHIP PROGRAM.

2012 –14 **President**, REGIONAL STUDENT GROUP-INDIA, ISCB-Student Council.

2012 –14 **Advisor**, LEUKIPPOS INSTITUTE.

Open source organisation where reserachers were involved in virtual collaborations resulting in several publications as well as poster presentation at IWBD A 2013,Imperial College,London,UK

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## Community Service

2017 **Judge,High school science projects**, STATE SCIENCE AND TECHNOLOGY FAIR OF IOWA 2017, Ames,Iowa.

2016, 2017, **Volunteer**, SCIENCE CENTER OF IOWA, Des Moines,Iowa.

2018 Participated in fun-filled activities to promote STEM study amongst girl students.

2016, 2017, **Volunteer,Road Less travelled program**, WOMEN IN SCIENCE AND ENGINEERING,IOWA STATE UNIVERSITY, Ames,Iowa.

Participated in fun-filled activities to promote STEM study amongst girl students.

Aug 2011 – **Teacher** , MAKE A DIFFERENCE,NGO , Vellore,India.

Aug 2012 Taught English to underprivileged kids in India on weekends.

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## Awards and Honors

2018 **Science Communication Fellowship** , REIMANN GARDENS,IOWA STATE UNIVERSITY, Ames,Iowa.

2018 **Best Poster presentation**, GRADUATE AND PROFESSIONAL STUDENTS RESEARCH CONFERENCE, GPSS, IOWA STATE UNIVERSITY, Ames,Iowa.

2018 **Third prize in Oral presentation**, BCBGSO SYMPOSIUM, IOWA STATE UNIVERSITY, Ames,Iowa.

2017,2016 **ISCB Travel Award**, INTELLIGENT SYSTEMS FOR MOLECULAR BIOLOGY CONFERENCE, ISCB.

2015-2016 **Diane Brandt Fellowship Award**, IOWA STATE UNIVERSITY, Ames,Iowa.

2013 **Taiwan International Graduate program-IIP Fellow**, ACADEMIA SINICA, Taipei,Taiwan.

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## Technical Skills

Operating Systems Windows, Linux (Redhat, Ubuntu), MacOS

Programming languages Python,R,Perl, Matlab

Scripting Languages HTML, CGI

Database skills SQLplus, Oracle10g,MySQL

Website development Wordpress, CSS

Open source software development  
Github  
Cloud platform  
Amazon AWS  
Experience with parallel programming and clusters  
Xsede, Condo, GPU

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## Computational Biology Softwares

Protein modeling  
Swissmodel, Chimera, Modeller  
Molecular Docking  
Autodock, Discovery Studio, Molecular Virtual Docker  
Pathway analysis  
Cytoscape  
Molecular Dynamics Simulations  
NAMD, Gromacs  
NGS Data analysis  
Bowtie, BWA, Samtools, GATK, Picard

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## Professional Memberships

International Society of Computational Biology  
Biophysical Society

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## References

Dr. Robert L. Jernigan  
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