

PROFESSIONAL SUMMARY

I am a recent doctoral graduate from the University of Birmingham, UK and presently holding a teaching position in India. My research interest include analysing large biological data sets, using machine learning for sequence analysis, protein-protein interaction involved in antibiotic synthesis pathways, modelling large macromolecular complexes and running molecular simulations.

EDUCATION

2015 **PhD Biosciences**, University of Birmingham, United Kingdom
Thesis title: Modelling polyketide synthases and related macromolecular complexes
Supervisors: Dr. Peter J. Winn and Prof. Christopher M. Thomas
Examiners: Dr. Tilmann Weber and Dr. Andrew Lovering

Jul 2008 – **Master of Technology in Bioinformatics**, Sam Higginbottom Institute of Agriculture,
Jun 2010 Technology and Sciences, India
CGPA 9.35/10 **Project title:** Epigenetic changes induced by Listeriolysin O modulated histone
Silver Medal modifications in *Listeria monocytogene*
Class Rank First **Supervisor:** Dr. Budhayash Gautam

Jul 2004 – **Bachelor of Technology in Biotechnology (Genetic Engineering)**, Allahabad
Jun 2008 Agricultural Institute Deemed University, India
CGPA 8.41/10 **Project title:** Comparative Modelling of Steroidogenic Acute Regulatory Lipid Transfer
First Division Domains in *Arabidopsis thaliana*.
with Honours **Supervisor:** Dr. Gitanjali Yadav

KEY SKILLS

Molecular modelling

Homology modelling
Active site architecture analysis
Small ligand docking
Protein interface analysis
Protein-Protein docking
Electrostatic potential analysis
Molecular dynamics simulation

- Parameter determination
- All atom (AMBER FF)

Sequence analysis and general bioinformatics

- Machine learning
- Co-evolution analysis
- Evolutionary trace analysis

Experimental techniques

Suicide mutagenesis

- Primer design
- PCR
- Gibson assembly
- Restriction digestion
- Plasmid Transformation
- Plasmid and PCR product purification

HPLC
Overlay bio-assays

Computational skills

Operating systems

- GNU/Linux (advanced)
- Windows (advanced)

Programming/scripting languages

- Perl (advanced)
- C++ (intermediate)
- R (Intermediate)
- HTML & CSS (intermediate)

Computer clusters and parallel computing (intermediate)
Network protocols and file management (advanced)
Content management systems (advanced)

WORK EXPERIENCE

Teaching

Apr 2015 – till date & Jul 2008 - Sep 2011 **Assistant Professor** at the Department of Computational Biology and Bioinformatics, Sam Higginbottom Institute of Agriculture, Technology and Sciences, Allahabad, India

ADMINISTRATION

Nov 2015 – till date **International Training Associate** at the Directorate of International Education and Training, Sam Higginbottom Institute of Agriculture, Technology and Sciences, Allahabad, India

PUBLICATIONS| h-index 6 | i10-index 4

1. **Farmer, R.**, Alsamarraie, Y., Winn, P.J., Thomas, C.M., *et. al.*, The Loop Between KS Dimers Plays a Role in Substrate Specificity and the Ability to Reengineer PKS Systems, (Manuscript under preparation).
2. **Farmer, R.**, Thomas, C.M., Winn, P.J., Comparison of the dynamics of ACPs indicates a shallower and surface exposed cavity formation in the PKS ACPs, (Manuscript under preparation).
3. **Farmer, R.**, Thomas, C.M., Winn, P.J., The Dynamics of MupH:Substrate Recognition During Polyketide Beta-Branching, (Manuscript under preparation).
4. **Farmer, R.**, Thomas, C.M., Winn, P.J., Modelling Polyketide Synthases and Similar Macromolecular Complexes, Current trends in Bioinformatics: an Insight, Chapter: 8, Gulshan Wadhwa, Jayesh Bellare, Atul Kumar Singh, P. Shanmughavel (Eds.). (Manuscript Accepted, Publisher: **Springer-Verlag**, Germany).
5. Khanim, F., Davies, N., Veliça, P., Hayden, R., Ride, R., Pararasa, C., Chong, G., Gunther, U., Veerapen, N., Winn, P., **Farmer, R.**, Davies, P., Trivier, E., Rigoreau, L., Drayson, M., Bunce, C., Selective AKR1C3 inhibitors do not recapitulate the anti-leukaemic activities of the pan-AKR1C family inhibitor medroxyprogesterone acetate, **British Journal of Cancer**, 2014 Mar 18;110(6):1506-16 [PMID: 24569460]
6. Haines, A.S., Dong, X., Song, Z., **Farmer, R.**, Williams, C., Hothersall, J., Płoskoń, E., Wattanamorn, P., Stephens, E., Yamada, E., Gurney, R., Takebayashi, Y., Masschelein, J., Cox, R.J., Lavigne, R., Willis, C.L., Simpson, T.J., Crosby, J., Winn, P.J., Thomas, C.M., Crump, M.P., A conserved motif flags acyl carrier proteins for β -branching in polyketide synthesis, **Nature Chemical Biology**, 2013 Nov;9(11):685-92 [PMID: 24056399]
7. Lodhi, S.S., **Farmer, R.**, Singh, A.K., Jaiswal, Y.K., Wadhwa, G., 3D structure generation, virtual screening and docking of human Ras-associated binding (Rab3A) protein involved in tumorigenesis, **Molecular Biology Reports**, 2014 Mar 21. [Epub ahead of print] [PMID: 24652202]
8. Kumar, S., **Farmer, R.**, Turnbull, A.P., Tripathy, N.K., Manjasetty, B.A., Structural and functional conservation profiles of novel cathepsin L-like proteins identified in the *Drosophila melanogaster* genome, **Journal of Biomolecular Structure and Dynamics**, 2013 Dec;31(12):1481-9 [PMID: 23256878]
9. Singh, S., Sablok, G., **Farmer, R.**, Singh, A.K., Gautam, B., Kumar, S., Molecular dynamic simulation and inhibitor prediction of cysteine synthase structured model as a potential drug target for trichomoniasis, **Biomed Research International**, 2013;2013:390920. Epub 2013 Sep 1 [PMID: 24073401]
10. Paital, B., Kumar, S., **Farmer, R.**, Chainy, G.B., In silico prediction of 3D structure of Mn superoxide dismutase of *Scylla serrata* and its binding properties with inhibitor, **Interdisciplinary Sciences--Computational Life Sciences**, 2013 Mar;5(1):69-76 [PMID: 23605642]
11. Gautam, B., Singh, G., Wadhwa, G., **Farmer, R.**, Singh, S., Singh, A.K., Jain, P.A., Yadav, P.K., Metabolic pathway analysis and molecular docking analysis for identification of putative drug targets in *Toxoplasma gondii*: novel approach, **Bioinformatics**, 2012;8(3):134-41 [PMID: 22368385]

12. Kumari, S., Shridhar, S., Singh, D., **Farmer, R.**, Hundal, J., Priya, P., Sharma, P., Bhavishi, K., Schrick, K., and Yadav, G., The role of lectins and HD-ZIP transcription factors in Isoprenoid based plant stress responses, **Proc. Ind. Natl. Sci. Acad**, 2012;78(4):671-691
13. Fazil, M.H.U.T., Kumar, S., **Farmer, R.**, Pandey, H.P., Singh, D.V., Binding efficiencies of carbohydrate ligands with different genotypes of cholera toxin B: molecular modelling, dynamics and docking simulation studies, **Journal of Molecular Modelling**, 2012 Jan;18(1):1-10 [PMID: 21409571]
14. Lodhi, S.S., **Farmer, R.**, Singh, A.K., Wadhwa, M., Jaiswal, Y.K., Wadhwa, G., Statistical analysis of differential gene expression profile for colon cancer, **Indian Journal of Biotechnology**, 2012;11(4):396-403
15. Paital, B., Kumar, S., **Farmer, R.**, Tripathy, N.K., Chainy, G.B.N., In silico prediction and characterization of 3D structure and binding properties of catalase from the commercially important crab, *Scylla serrata*, **Interdisciplinary Sciences--Computational Life Sciences**, 2011 Jun;3(2):110-20 [PMID: 21541840]
16. Singh, S., Singh, G., Singh, A.K., Gautam, G., **Farmer, R.**, Lodhi, S.S., Wadhwa, G., Prediction and analysis of paralogous proteins in *Trichomonas vaginalis* genome., **Bioinformatics**, 2011 Mar 2;6(1):31-4 [PMID: 21464842]
17. Kumar, S., **Farmer, R.**, Turnbull, A.P., Tripathy, N.K., Manjasetty, B.A., Identification, sequence and structural analysis of cathepsin L-like proteins in *Drosophila melanogaster*, **Journal of Natural Science, Biology and Medicine**, 2011; 2(3):28
18. Gautam, B., Katara, P., Singh, S., **Farmer, R.**, Drug target identification using gene expression microarray data of *Toxoplasma gondii*, **International Journal of Biometrics and Bioinformatics**, 2010;4(3):113-124
19. **Farmer, R.**, Gautam, B., Singh, S., Yadav, P.K., Jain, P.A., Virtual screening of AmpC/ β -lactamase as target for antimicrobial resistance in *Pseudomonas aeruginosa*, **Bioinformatics**, 2010 Jan 17;4(7):290-4 [PMID: 20978601]

CONFERENCES AND TRAINING

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| Oct 2015 | National Conference on Bioinformatics Panorama in Agriculture and Health, Allahabad, India, Sponsor Liaison, Organising Committee |
| Oct 2014 | 1 st RSG-UK Student Symposium on Computational Biology and Life Sciences, Pontypridd, Wales, Secretary, Organising Committee |
| Sep 2014 | Synthetic biology of antibiotic production II, Sant Feliu de Guixols, Spain, Short Talk |
| Jul 2014 | The 28 th Annual Symposium of The Protein Society, San Diego, USA, Poster Presentation |
| Nov 2013 | 15th EMBL PhD Symposium, Heidelberg, Germany, Short Talk |
| Jul 2013 | ISMB/ECCB'13, Berlin, Germany, Poster Presentation |
| May 2013 | Molecular Perspectives On Protein-Protein Interactions, Pultusk, Poland, Poster Presentation |
| Sep 2012 | ECCB'12 - 11 th European Conference on Computational Biology, Basel, Switzerland, Poster Presentation |
| Jun 2012 | 3 rd BEAR Postgraduate Conference on Research Computing, University of Birmingham, Secretary and Sponsor Liaison, Organising Committee |
| Jun 2012 | Leading Academics, Leadership development program, University of Birmingham |
| Feb 2012 | Talent Pool, Training program on entrepreneurship, University of Birmingham |
| Jan 2010 | The Eighth Asia Pacific Bioinformatics Conference, Bangalore, India, Poster Presentation |
| Nov 2009 | National Workshop on Functional Genomics and Proteomics, Bhubaneswar, India |
| Mar 2009 | International Conference on Open Source for Computer Aided Drug Discovery, Chandigarh, India, Poster Presentation |

FELLOWSHIPS AND AWARDS

- Young Scientist Award from Society of Bioinformatics and Biological Science, India, 2015
- Travel grant from Biochemical Society to attend the 28th Annual Symposium of The Protein Society, USA, 2014
- Travel grant from EMBL to attend 15th EMBL PhD Symposium, Germany, 2013
- Travel grant from National Science Foundation to attend ISMB/ECCB'13, Germany, 2013
- George Parks travel grant from the University of Birmingham to attend Molecular Perspectives On Protein-Protein Interactions, Poland, 2013
- Travel grant from the Swiss Foundation for Excellence and Talent in Biomedical Research to attend ECCB'12, Switzerland, 2012
- PhD scholarship from The Darwin Trust of Edinburgh, UK, 2011-2014
- Silver medal in M.Tech. Bioinformatics, SHIATS, India, 2010

PROFESSIONAL MEMBERSHIPS

- Society of Bioinformatics and Biological Science (Life Time)
- The Protein Society (2013-2014)
- International Society for Computational Biology (ISCB) (2012-2015)
- Biochemical Society (2012-2015)

EXTRA CURRICULAR POSITIONS HELD

- Secretary, Regional Student Group, UK, Student Council, ISCB, 2013-2014
- Secretary, Bharat Parivar, Guild of Students, University of Birmingham, 2011-2012
- Vice president for Society of Biotechnology, SHIATS, 2009-2010

REFERENCES

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