



9311618895  
[avish2k@gmail.com](mailto:avish2k@gmail.com)  
Gurgaon

## AVINASH MISHRA

**SYNOPSIS** Total 5+ years of work experience in drug discovery research and startup.

### PROFESSIONAL ACHIEVEMENTS

- **Awarded INDO-AUSTRALIAN Gold Fellowship for post-doctoral position and successfully completed the research.**  
In 2017 DBT awarded an Indo-Australian gold fellowship for conducting research in Griffith University, Queensland, Australia. This program aimed to allow Indian research fellow to perform life science research in Australian University. Collaborative research in the area of (i) drug discovery (ii) machine learning and (iii) computational protein structure was performed during the duration. Three internationally reviewed publications were made in partner with experimentalists and computational researchers of Griffith and Macquarie University Australia.
- **Headed a BIG-BIRAC project awarded by department of biotechnology.**  
Aim of this project was to design and test new inhibitor against GSK 3 $\beta$  and DPP-4 protein drug target for type 2 diabetes. This project was awarded to IITD startup 'Novo Informatics' where I headed a team to conduct and successfully conclude the project in 18 months.
- **Editor at Scientific Reports, Nature Publishing Group.**

### PROFILE AT A GLANCE

- 5+ Year research experience after finishing PhD.
- Authored 9 peer reviewed publications, 1 book chapter, 1 workshop article.
- Filed 1 Indian patent titled "Polypeptide Sequences and Compositions thereof".
- Experienced in working in collaboration with different academic and non-academic institutes.
- Secured INR 50 Lacs project from Govt. Funding agency.
- Proficient in handling research projects and execute it as well as managing the logistic of project.
- Known skills to envision and create successful outcomes in complex situations.
- An ambitious and hardworking individual with excellent relationship management skills and the capability to manage time effectively.
- Strong analytical, self-motivation and problem-solving skills.
- Power of Idea Fellow 2012, Training on Business strategy and Start up management Indian Institute of Management (IIM) Ahmedabad [Funded by Govt. of India]

### SKILLS

- Computational Structural Biology, Drug Design, Protein Chemistry, Bioinformatics, Computer Programming (C, C++, Perl),
- Linux (Shell Scripting), Statistical Analysis (R Package), Molecular Dynamics (GROMACS & AMBER)

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- Statistical Mechanics, Unsupervised Machine Learning, Artificial Neural Network
  - Project management, Technology/Program Landscaping, Business Development, Proposal designing, Fund raising from Govt.'s.
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## WORK HISTORY

### **DIRECTOR, GROWDEA TECHNOLOGIES PVT. LTD, NEW DELHI**

- Managing all business operations.
- Involved in client interaction on science and technical ground.
- Responsible for constructing the scientific pipeline for projects.

### **POST-DOCTORAL FELLOW, COE BIOPHARMACEUTICAL, CHEMICAL ENGINEERING, IIT-DELHI**

Feb 2019 – Feb 2020 (1 Years)

- Working on several biotherapeutics (GCSF, mAbs) to understand their stability and activity relation with its structure.
- Design powerful excipients to inhibit the deamidation of mAb and provide more stability without effecting its native activity.
- Working on “Big Four” snake’s venom of India to design peptide-based therapy for snake venom.

### **POST-DOCTORAL FELLOW, IIS, GRIFFITH UNIVERSITY, QUEENSLAND, AUSTRALIA (SUPERVISOR: PROF. ABDUL SATTAR)**

April 2017 – January 2019 (1 year 8 months)

- Working on several projects in structural computational biology and machine learning application in life science research.
- Worked in close collaboration with computer programmer and biologist to execute the project.
- Explored the Role of solvent accessibility for aggregation-prone patches in protein folding using computational methods.
- Worked with chemist and experimentalist to identify Novel Scaffold for Inhibition of Dipeptidyl Peptidase-4.
- Extensively worked on designing new machine learning algorithm in the area of drug design, especially on Toxicity Prediction by Multimodal Deep Learning.

### **POST-DOCTORAL FELLOW, CHEMICAL ENGINEERING, IIT-DELHI (SUPERVISOR: PROF. ANURAG RATHORE & DR. GAURAV GOEL)**

Jan 2016 – Feb 2017 (1-year 1 month)

- Diabetes stands at top position in the list of these diseases in terms of its negative impact of human health at mass scale.
- Insulin has been used for several decades to cure and control diabetes, but its aggregation during storage has emerged as biggest challenge for pharmaceutical companies.
- As a post doctorate fellow, I was responsible for studying the aggregation process using computational approaches. I was also assigned to design and development of small peptide to inhibit aggregation.

### **DEVELOPMENT OF STAND-ALONE SOFTWARE PACKAGE FOR DESIGNING AND TESTING DRUG LIKE CANDIDATE AT NOVO INFORMATICS PVT. LTD.**

2011-2014 (PARALLEL TO PHD)

In-silico approach to design and discover new drug molecule is complementing at high rate to drug discovery process. In this regard a team under my supervision developed a software package INVENTUS that composed of all essential modules to perform

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early drug discovery research. Software has primarily developed to promote drug discovery at academic level by providing cost effective solution to researcher. Product is also available for free trial period of 1 month to all users where they can publish their work using INVENTUS. Detail of the product can be found at <http://www.novoinformatics.com/inventus.php>.

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## EDUCATION

**DOCTOR OF PHILOSOPHY (PHD), KUSUMA SCHOOL OF BIOLOGICAL SCIENCES, INDIAN INSTITUTE OF TECHNOLOGY, DELHI (IIT-D), 2016.**

- SCFBio, IIT Delhi (Supervisor: Prof. B. Jayaram)
- Published research article, presented poster and oral presentation.

**POST-GRADUATION DIPLOMA, BIOINFORMATICS, INSTITUTE OF BIOINFORMATICS & APPLIED BIOINFORMATICS (IBAB)-BANGALORE, 2009**

- 7.6 CGPA.
- Awarded Best Computational Biology Student Award, by Accelerys Inc.

**BACHELOR OF TECHNOLOGY (BTECH) IN BIOTECHNOLOGY, INSTITUTE OF INTEGRATED LEARNING & MANAGEMENT – GREATER. NOIDA, 2007.**

- 8.0 CGPA.
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## PUBLICATIONS

1. Structure-Based Design of Small Peptide Ligands to Inhibit Early-Stage Protein Aggregation Nucleation, **Avinash Mishra**, Rohit Bansal, Shravan Sreenivasan, Rozaleen Dash, Srishti Joshi, Richa Singh, Anurag S. Rathore\*, and Gaurav Goel\*, *J. Chem. Inf. Model.* 2020, 60, 6, 3304–3314
  2. Mechanistic explanation of structural and functional changes induced by methionine mutation in G-CSF protein, **Avinash Mishra**, Rucha Patil, Sumit K Singh, Priyanka Dalal, Anurag S Rathore, *Current Research in Biotechnology*; 2, 2020, 37-44
  3. Identification of a Novel Scaffold for Inhibition of Dipeptidyl Peptidase-4, **A Mishra**, M Cross, A Hofmann, MJ Coster, A Karim, A Sattar, *Journal of Computational Biology* 26 (12), 1470-1486. (corresponding author)
  4. Understanding the mechanism of copurification of “difficult to remove” host cell proteins in rituximab biosimilar products, SK Singh, **A Mishra**, D Yadav, N Budholiya, AS Rathore *Biotechnology progress*, e2936
  5. Toxicity Prediction by Multimodal Deep Learning, A Karim, J Singh, **A Mishra**, A Dehzangi, MAH Newton, A Sattar, *Pacific Rim Knowledge Acquisition Workshop*, 142-152.
  6. Efficient toxicity prediction via simple features using shallow neural networks and decision trees, A Karim, **A Mishra**, MAH Newton, A Sattar, *ACS Omega* 4 (1), 1874-1888. (equal first author & corresponding)
  7. Role of solvent accessibility for aggregation-prone patches in protein folding, **A Mishra**, S Ranganathan, B Jayaram, A Sattar, *Scientific reports* 8 (1), 12896. (corresponding author)
  8. Machine Learning Interpretability: A Science rather than a tool, A Karim, **A Mishra**, MA Newton, A Sattar, *arXiv preprint arXiv:1807.06722*.
  9. ProTSAV: A protein tertiary structure analysis and validation server, A Singh, R Kaushik, **A Mishra**, A Shanker, B Jayaram, *Biochimica et Biophysica Acta (BBA)-Proteins and Proteomics* 1864 (1), 11-19.
  10. Bhageerath-H: a homology/ab initio hybrid server for predicting tertiary structures of monomeric soluble proteins, B Jayaram, P Dhingra, **A Mishra**, R Kaushik, G Mukherjee, A Singh, *BMC bioinformatics* 15 (16), S7
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11. D2N: Distance to the native, **A Mishra**, PS Rana, A Mittal, B Jayaram, *Biochimica et Biophysica Acta (BBA)-Proteins and Proteomics* 1844 (10), 1798-1807.
  12. Capturing native/native like structures with a physico-chemical metric (pcSM) in protein folding, **A Mishra**, S Rao, A Mittal, B Jayaram, *Biochimica et Biophysica Acta (BBA)-Proteins and Proteomics* 1834 (8), 1520-1531.

**PATENT FILED**

Polypeptide Sequences and Compositions thereof, Patent No: 201711030494, Indian Patent Office, Publication Status.

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