

KRISHNA KUMAR TIWARI

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Profile Summary:

A Biotech Engineer with 6 + years of experience in the area of computational system biology. Hand-on experience of different *in-Silico* pathway modeling tools and have extensive knowledge of different signaling and metabolic pathway leading to development of diseases like cancer, inflammation, Skin aging and pigmentation. Special research focuses on Oncology & Dermatology and handled the development of virtual prototype cells. Also having experience of *in-silico* Drug testing, target identification and pharmacokinetic analysis using virtual cell system. Having experience of handing client projects and involved in project planning and implementation.

Carrier Prospect:

To work for the growth of biological understanding and make the complex biology simpler to understand.

EXPERIENCE

- **Lead Scientist – Dermatology at Cellworks Research India Pvt Ltd** **October 2007 to Present**
 - Started Dermatology platform in Cellworks and did planning for the development of model needed for platform. Successfully created three major cell type in Skin i.e. Keratinocyte, Melanocyte and Fibroblast in-silico virtual cell models and also did major compound testing and target identification for some major cosmetic companies like ISP (International Specialty Products), P&G and Lo’real.
 - Major Focus areas are **Pigmentation, aging, inflammation, wound healing and Skin cancer.**
 - Involved in onsite Client presentation and project planning. Did project and presentations with cosmetic majors in the world like Lo’real, P&G and Unilever.
 - Team management and organization with 15+ members
 - Team mentoring and training. Expertise in technical trouble shooting and problem solving
 - Making technical presentation and white papers for client projects
 - Data analysis and developing new ways to present simulation data in a graphical form
 - Very confident with Data mining and analyzing high- throughput data efficiently
- **Senior Biomodeling Scientist - Oncology at Cellworks Research India Pvt Ltd** **March 2007 to September 2007**
 - Testing and analyzing anti-cancer drugs which are under clinical trials and predict their efficacy & safety using virtual cell system
 - Development of comprehensive disease aligned, ODE (Ordinary Differential Equation) based biological model for the biological processes leading to cancer (Virtual prototyping technology platform)
 - Development and integration of cell signaling model for the generic virtual tumor cell model with different growth factor, cytokines and hormonal pathways
 - Developed complete cell cycle model and integrated of EGFR (growth factor) signaling with cell cycle model
 - Data mining and model validation with experimental data. Expertise in technical trouble shooting and problem solving
- **Biomodeling Scientist- Oncology at Cellworks Research India Pvt Ltd** **July 2006 to Feb 2007**
 - Development of comprehensive disease aligned, ODE based biological model for the biological processes leading to cancer (Virtual prototyping technology platform).
 - Data mining and development of p53-MDM2 pathway, Wnt-Frizzled signaling pathway, EGFR signaling pathway, TGF beta signaling, MAPK signaling, B-Catenin signaling, Calcium signaling and integrated them. First member to do pathway level integration in Cellworks.
 - Developing comprehensive and detailed static maps for the Wnt, EGFR and TGF beta pathway with kinetic data.
- **Intern – Oncology at Cellworks Research India Pvt Ltd** **Jan 2006 to June 2006**
 - Started oncology platform along with two other members
 - Development of pathways whose deregulation leads to cell transformation

- Developed kinetic models for I κ B-NF κ B pathway, AP1 regulation pathway, p53-MDM2 pathway, JAK2-STAT6 pathway, B-Catenin pathway, IL1 pathway, VEGF pathway
- Also introduced the concepts of modeling negative feedback loops and gene transcription in cellworks
- Worked on various simulators like Cell Designer, Copasi, Jsim

Internship at “All India cancer institute and research centre, Hyderabad” May 2004 to June 2004

- Cancer cell identification with transformation characteristic in cancerous cell physiology
- Learnt about different methods used for Cancerous cell identification and HIV diagnosis

Scientific Achievements

- Poster presentation at “AAD” for testing active effect on pigmentation (PARIS, 2009). Came as publication in Journal of American Academy of Dermatology.
- The publication reference is :

Ex vivo studies and in silico evaluation of a melanin-inducing active: Enhancing skin pigmentation while decreasing ultraviolet light-induced inflammatory cytokine release

JOURNAL OF THE AMERICAN ACADEMY OF DERMATOLOGY, Volume: 60 Issue: 3 Pages: AB38-AB38 Published: 2009

- Filed a patent (**Indian Patent application No: 1988/CHE/2009**, filing done with the Cellworks Research india) for the effect of a novel combination of anti-oxidant and one other in-house found target which shows one of the best anti-aging properties which is under in-vitro validation process.
- Work presented in “Gorden Research Conference, August 2011” as "**An in silico approach for a comprehensive view of cell-cell interactions in barrier dynamics**". Work Presented by Dr. Shireen Vali (Cellworks Group, California and Bangalore).

Projects done:

- **Development of biological pathway whose de-regulation leads to cancerous cell transformation**
 - Scoping and development of comprehensive molecular interaction map and ODE based mathematical model for pathway responsible for cancerous cell transformation such as NF κ B signaling, p53 signaling, JAK-STAT signaling, AP1 signaling, IL1 signaling and VEGF signaling. Validated the model results with 100+ experimental results and Inhibition/knockdown studies.
 - Data for the model development is extracted after reading 500+ experimental and review papers.
- **Development of cell cycle pathway and its regulation by Growth factor signaling. Test CDK and Tyrosine kinase inhibitors effect on cell cycle progression**
 - Scoping and development of comprehensive molecular map and ODE based mathematical model for mammalian cell cycle with the regulation of different cyclins and CDKs by growth factor signaling
 - Integrated model consists of 800+ reaction with 2500+ parameters
 - Check the effect of EGFR inhibitor (Imitinib) and CDK2 inhibitor on Cell cycle progression
- **Development of virtual Keratinocyte and Melanocyte cell system with Pigmentation and differentiation and Inflammation focus**
 - Developed the virtual Keratinocyte and Melanocyte cell system whose functioning is regulated by plethora of triggers like UV (UVA and UVB) growth factor (EGF, bFGF, TGF α), cytokine (IL1, IL6, IL4, TNF α) and hormones (CRH). Major focus was **Pigmentation, Inflammation and Cancer**.
 - Developed each of the pathways individually and integrated these pathway one by one to develop the complete cell system with different autocrine and paracrine regulation like IL1, TNF.
- **Testing of two different actives on Melanin synthesis in Melanocyte and check for side effect in terms of inflammation-Client based project**
 - On the Keratinocyte-Melanocyte integrated pigmentation system, tested the effect of two actives given by the client and reported the result. Results were correlated with the experimental (wetlab) data and found good correlation between the in-vivo and in-silico results. Results presented in American Association of Dermatology and later considered as Publication.

- **Development of virtual Fibroblast cell system with Aging. Fibrosis and Inflammation focus.**
 - Developed and integrated the various signaling and metabolic pathway (TGF, FGF, CTGF, Cytokines,) effecting aging process. The main focus was the effect of UV induced ROS production on the Collagen, Elastin and Hyaluronan synthesis and degradation. Main development focus was **Aging and Wound Healing**
 - Predicted the effect of various compounds developed by top cosmetic companies in the world and later it was validated by them experimentally.
 - Currently working on the role of Fibroblast cells (Synovial Fibroblast) in **Rheumatoid Arthritis and Cancer.**
- Work as testing person for the in-house development of modeling and analysis software. Also help them with the algorithms of analysis methods.

Technical Skills:

- Excellent Scientific data mining and data interpretation & correlation.
- Biological and Biochemical pathway modeling using ordinary differential equation (ODE).
- Drug target identification and biomarker based result analysis
- High- through output data analysis.
- Good grip on Cancer and Skin biology.

Academics

- **Graduation: B.TECH Biotechnology** **2002 to 2006**
 - Collage: ICFAI University, India
 - Grade : CGPA 8.60 (scale of 10)
 - Modules: Microbiology, Biochemistry, Cell and Molecular Biology, Immunology, Developmental Biology, Genetics, Statistics, Mathematics, C programming, Principal of management
- **Senior Secondary (10+2): PCMB** **2000 to 2002**
 - Collage: Jawahar Navodaya Vidyalaya, Dumka, Jharkhand
 - Grade: 64 %
 - Modules: Mathematics, Chemistry, Physics, Biology, English, Physical training

Computational Skills

- Knowledge of modeling tools such as Jsim, Copasi and proficiency in using Teranode Biological modeler & cell designer
- Knowledge of Oracle 9i with course modules such as SQL, PL/SQL, TRIGGERS, EXCEPTIONS, PACKAGES
- C/C++ language basics
- Windows and Linux operating system

Personal Strength

Confident with decision making and desire to lead & success, Creativity and self motivation, Planning and execution, Desire to learn, innovative thinking, Crave to take responsibility

Area of Interest

Systems Biology, Dermatology, Oncology, Cell and Molecular biology, Biochemistry, Genetics, Stem cell Research

Extracurricular Achievements

- University level Volleyball player and Captain of the team.
- Experience in organizing cultural and sports events

References:

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