



Dr. BINDU KUMARI

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EDUCATION AND RESEARCH

(1) Current position: Assistant Professor,
Electronics Engg. Dept., Dr. Ambedkar Institute of Technology for Divyangjan, Kanpur.

(2) PhD, Indian Instt. of Technology (B.H.U), Varanasi, July 2023

Ph. D Thesis Topic:

Computational Systems Biology based analysis of Malignant Tumour elimination

Subjects of Graduate Study:

Biopotentials, Tissue Engineering, Mathematical Methods, Radiobiology, Computational Neuroscience.

(3) M.Tech in Biomedical engineering, July 2017

School of Biomedical engineering

Indian Institute of Technology (Banaras Hindu University), Varanasi -India.

M. Tech Thesis Title-

Development of EMG Sensor for Prosthetic Hand Control

Subjects of Study:

Bio-instrumentation, Biological control system, Image processing, Electrophysiology, Bio-materials, Bio-transport, Human physiology.

(4) Bachelor of Technology (B. Tech in Electrical & Electronics Engg.), June 2013

GLA Institute of Technology & Management, Mathura (Affiliated to G.B. Technical University, Lucknow)

Selected Subjects of Study: Control system, Network Theory, Electronics circuits, Signal and System, Computer system, Digital system, Microprocessor, Computer system, engineering mathematics, power electronics.

PUBLICATIONS & PATENTS

PUBLICATIONS

- (1) Baghel, B., Kumari, B., Bhattacharjee, A. et al. High resilience of human cerebellum in Alzheimer's disease: reciprocal coupling of cellular anabolic and catabolic fluxes enable intensive neuroprotection. *3 Biotech* 15, 138 (2025). <https://doi.org/10.1007/s13205-025-04264-y>.
- (2) **Bindu Kumari**, C Sakode, R Lakshminarayanan, Prasun K. Roy. Computational systems biology approach for permanent tumor elimination and normal tissue protection using negative biasing: Experimental validation in malignant melanoma as case study[J]. *Mathematical Biosciences and Engineering*, 2023, **20**(5): 9572-9606. doi: [10.3934/mbe.2023420](https://doi.org/10.3934/mbe.2023420).
- (3) **Bindu Kumari**, C Sakode, R Lakshminarayanan, P Purohit, A Bhattacharjee, Prasun K. Roy. A mechanistic analysis of spontaneous cancer remission phenomenon: identification of genomic basis and effector biomolecules for therapeutic applicability. *3 Biotech journal*. 2023 Apr;**13**(4):113. doi: [10.1007/s13205-023-03515-0](https://doi.org/10.1007/s13205-023-03515-0).
- (4) **Kumari, B.,** Arushi, M., Ashish S., Ashutosh, S., & Roy, P. K., Spontaneous cancer regression as reversion of spontaneous cancer progression: Molecular targets and pharmacological implications, *Journal of Biomolecular Structure and Dynamics*. (under communication).
- (5) **Bindu Kumari**, V. Singh, B. Koch, Prasun K. Roy. TOP2A inhibitors as a therapeutic agent in melanoma: Evidence from gene silencing approach, *Current Bioinformatics* (under communication)
- (6) **Bindu Kumari**, C Sakode, L. Raghavendran, P K Roy, System biology approach to normal tissue protection in cytotoxic cancer therapy: Experimentally validated gene/signaling basis – Melanoma as case study., *Annals of Oncology* (2022) 33 (suppl_7): S356-S409. [10.1016/annonc/annonc1059](https://doi.org/10.1016/annonc/annonc1059)
- (7) **Bindu Kumari**, C Sakode, L. Raghavendran, P K Roy, Systems biology basis of permanent tumor regression with normal tissue protection: Experimentally validated signaling pathway framework. *J. Clinical Oncology*, 40 (16), Suppl.1, e15066, 2022 https://ascopubs.org/doi/10.1200/JCO.2022.40.16_suppl.e15066.

- (8) Ruttala, R., Purohit, P., Bhattacharjee, A., **Kumari, B.**, & Roy, P. K. (2022). MRI-DTI Imaging Reveals Specific Neuro-degeneration Signature in Precuneus Node of Awareness Processing in Brain under Alzheimer's Disease. *J. Adv. Applied Scientific Res.* **4**(4), 102-111.
- (9) Prakash, A., **Kumari, B.**, & Sharma, S. (2019). A low-cost, wearable sEMG sensor for upper limb prosthetic application. *Journal of Medical Engineering & Technology*, 43(4), 235-247.
- (10) **Kumari, B.**, Prakash, A, Sharma, S. Development of EMG Sensor for Prosthetic Hand Control, International Conference on Innovation Research in Applied physics, Material sciences, Instrumentation, Electronics, Communication, Electrical, Power Control, Computer system, and Information technology at Jawaharlal Nehru University (TECHNOVA-2017), New Delhi.

PATENT :

Prakash, **B. Kumari**, S. Sharma & N. Sharma "EMG sensor for prosthetic hand control," Indian Patent Ref. No. 201811016601, May 2, 2018 (status: published).

TEACHING EXPERIENCE

UG & PG: Teaching Assistant as MTech scholar and PhD scholar.

Subjects: **(1)** Biological Control System **(2)** Introduction to Biomedical Engg. **(3)** Radiation Biology **(4)** Human Physiology

UG & PG: Lab instruction assistant as MTech scholar and PhD scholar.

Subjects: **(1)** Biological Control System **(2)** Introduction to Biomedical Engg. **(3)** Human Physiology

Teaching Training Faculty: (1) Medical Imaging Course, IIT BHU

(2) Neuromatch Academy, University of Pennsylvania (online)

Lab instruction Training Faculty: (1) Medical Imaging Course, IIT BHU

(2) Neuromatch Academy, University of Pennsylvania (online)

TECHNICAL SKILLS

- 1. Bioinformatics and Molecular Biology platforms:** AutoDock, Discovery studio, Pymol, PyRx, Ingenuity Pathway analysis(IPA), Reactome, Cytoscape, DAVID, CyTarget, KEGG, FunRich, The Human Protein Atlas (THPA), String database, Ensembl-Nextgenhelper.
- 1. Computer Languages** : C, MATLAB, Python, Machine Learning, and R-Language.
- 2. Hardware Skills** : 3-D printer, 8085 microprocessor kit, microcontrollers (like Arduino), NI DAQ (data acquisition) System, ELVIS BOARD, ECG and EMG machine.
- 4. Software Packages** : Microsoft word, Microsoft excel, Microsoft power point, MATLAB, NI Lab VIEW, Assembly language of 8085 microprocessor Systems.
- 5. Operating Systems** : Windows XP, Windows 7, Ubuntu, Windows 10, Windows 11.

PROJECTS

MASTER'S DISSERTATION (2016-2017), IIT (BHU)

As a part of my master's dissertation, I have developed a highly sensitive and potable EMG (Electromyography) Sensor for 3-D printed prosthetic hand control. This work obtained the following attainments: -

1. EMG-based Prosthetic Hand technology is selected for translational support from Deign Innovation Center, IIT.
2. This Project technology has been incorporated for Innovation Incubator initiative by Hewlett Packard.
3. Best Presentation selected on Institute Foundation Day, 2017.

BACHELOR'S DISSERTATION

4th year project: Guided by Y Shasi Kumar, Asst. Professor, GLA College of Engineering, Mathura, Jan-May 2013

- Solar Based Asymmetrical Multilevel Inverter.

AWARDS/ HONOURS

- DBT Travel Award for ESMO (European Society for Medical Oncology) Congress-2022, Paris, France.
- CSIR Travel Grant, 2022.

- Lead TA Faculty for Computational Neuroscience course in Neuromatch Academy (NMA) Pennsylvania, 2022 (Online)
- 1st Prize in Poster presentation on "Novel Drug Discovery for Acute Encephalitis using AI based machine-reading and knowledge-mapping of Medical Literature Text" in **61st Annual Conference of National Academy of Medical Science(NAMS)** at Institute of Medical Science Banaras Hindu University, Varanasi, November 2021.
- 2nd Prize in Quiz held during Workshop on Insilco Drug Designing using Network Pharmacology Approach, Department of Applied Science, IIIT Allahabad, 2021.
- Travel fellowship Award for 15th meeting of Asian-Pacific society of Neurochemistry APSN- 2018, MACAU S.A.R, China, 2018.
- Travel fellowship Award for 3rd IBRO/APRC Chandigarh Associate Neuroscience School, 2018.
- Foundation Day Award for Best Working Model. Indian Institute of Technology, Varanasi, 2018.
- Research Fellowship Award from Indian Institute of Technology (2017-Present)
- Masters' Fellowship from Indian Institute of Technology (2015-2017).
- Graduate Aptitude Test in Engineering (GATE) Award, Govt. of India, 2015.

Translation to Industry

1. The scope of Industrial Translation of the Neuroscience based Artificial Hand has been highlight in National Newspaper of Timeless Beacon ("Amar Ujala") on 18 Feb 2018.
2. Exploratory of a joint initiative with the Government industry "Artificial Limb Manufacturing Corporation of India", Kanpur (Under Public sector).

SUMMER TRAINING

- Summer training from UP PTCL (220KV sub-station, Naubasta, KANPUR) in 2012.
- Summer training from Northern Coalfield Limited (NCL), Amlohri project in 2011.

WORKSHOP / CONFERENCE PRESENTATIONS

- Faculty Development program (23 July, 2024 to 27 July, 2024) organized by Dr. Ambedkar Institute of Technology for Divyangjan U.P, Kanpur, on "Assistive Technologies for Equitable and Inclusive Education" Sponsored by Dr. A. P. J Abdul Kalam Technical University, India.
- 42nd Annual Conference of the IACR (Indian Association of Cancer Research) -2023, 12-16, Jan., ACTREC, Tata Memorial Center, Navi Mumbai, India.
- ESMO (European Society for Medical Oncology) Congress-2022, 9-13 Sept, Paris, France.
- Workshop on Solidworks for Biomedical Applications, Department of Biomedical Engineering University College of Engineering(A), Osmania University, February, 2022.
- Workshop on Insilco Drug Designing using Network Pharmacology Approach, Department of Applied Science, IIIT Allahabad, 2021
- 61st Annual Conference of National Academy of Medical Science(NAMS) at Institute of Medical Science Banaras Hindu University, Varanasi, November 2021.
- Short-Term Course (with Hands-On-Training) on 'Advances in Medical imaging', in I-DAPT HUB Foundation, IIT BHU, March 2021.
- An online short-term certificate course on Analytical Techniques to Study from Biomolecules to Tissues (ATSBT-2021), July,2021.

- 8th International Translational Cancer Research Conference on 'Role of Inflammation and Immune System for Cancer Prevention and Treatment', Dept. of Biochemistry, Institute of Science (BHU) and Society for Translational Cancer Research(STCR), 2020.
- 3rd Workshop on 'Brain, Computation and Learning' at Indian Institute of Science (IISC) Bengaluru, INDIA, June 2019.
- 15th meeting of Asian-Pacific society of Neurochemistry APSN- 2018, MACAU S.A.R, China,2018.
- ISN-APSN Neuroscience School at Macau University of Science and Technology (CHINA) in 2018.
- 3rd IBRO/APRC Chandigarh Associate Neuroscience School, 2018.
- 36th Annual Conference of Indian Academy of Neuroscience in IIT BHU, 2018.
- Seminar on image fusion at GLA Mathura in 2012.
- Seminar on 5s implementation in workplace in GLA Mathura,2012
- TECHNOVA-2017(International Conference) organized by" krishi Sanskrit" at Jawaharlal Nehru University, New Delhi

Research Presentations

- Poster presentation on "Genomics Basis and Nodal Genes of Endogenous Spontaneous Cancer Remission Phenomenon: Network Pharmacology and Biosystems Analysis" in 42nd Annual Conference of the IACR (Indian Association of Cancer Research) -2023, 12-16, Jan., ACTREC, Tata Memorial Center, Navi Mumbai, India
- Poster presentation on "System biology approach to normal tissue protection in cytotoxic cancer therapy: Experimentally validated gene/signaling basis – melanoma as case study" in **ESMO Congress** from 9-13 Sept., in Paris, France.
- Poster presentation on "Experimentally Validated Systems Biology-Based Approach Enables: (1) Permanent Tumour Remission, With (2) Normal Tissue Protection" in **8th International Translational Cancer Research Conference on 'Role of Inflammation and Immune System for Cancer Prevention and Treatment'**, in Dept. of Biochemistry, Institute of Science (BHU) and Society for Translational Cancer Research(STCR), 2020.
- Poster presentation on "Long-term Structural Stability observed in Cerebellum during Ageing: Radiological Genomics identifies Neuroprotective Drugs with Clinical Validation" in **61st Annual Conference of National Academy of Medical Science(NAMS)** at Institute of Medical Science Banaras Hindu University, Varanasi, November 2021.
- Poster presentation on "Novel Drug Discovery for Acute Encephalitis using AI based machine-reading and knowledge-mapping of Medical Literature Text" in **61st Annual Conference of National Academy of Medical Science(NAMS)** at Institute of Medical Science Banaras Hindu University, Varanasi, November 2021.
- Poster presentation on "Development of Neuromuscular EMG Acquisition and Processing for Neural Control of 3-D Printed Prosthetic Hand" in **ISN-APSN Neuroscience School at Macau University of Science and Technology (CHINA) in 2018.**
- Poster presentation on "Development of EMG (Neural signal) Sensor for Prosthetic Hand Control" in **3rd IBRO/APRC Chandigarh Associate Neuroscience School, 2018.**
- Poster presentation "Optimal Neural Sensor based Control using linear envelop waveform for developing affordable Neuroprosthetic hand in amputee patients" in **36th Annual Conference of Indian Academy of Neuroscience in IIT BHU, 2018.**
- Poster presentation on "Development of EMG controlled prosthetic hand" in All India DIC (Design Innovation Center) meet up 2018 in IIT BHU.
- Poster presentation on "Low cost EMG sensor for prosthetic hand control" in Institute day in 2017 in IIT BHU.

- Poster presentation on "Development of EMG sensor for controlled prosthetic hand" in Institute day in 2018 in IIT BHU.

EXTRA CURRICULAR ACTIVITIES

- Lead TA Faculty for Computational Neuroscience course in Neuromatch Academy (NMA) Pennsylvania, 2022 (Online)
- **Marathon runner** with active participation in various sporting events including the Kanpur and Delhi half marathon ,2023
- Active member of **E-soc** (Electrical society.)
- Active participation in technical & cultural carnival of bold **Annual festival**.
- 2 times winners of incredible india in **Annual college festival**.
- Deputy coordinator in **KRITIKALA**.(cultural event)
- Coordinator in **SPANDAN'13(Institute college meet)**
- Won **Second Prize** in **Press Conference** in Technical fest.

SUBJECTS OF INTEREST

- Brain-computer interface for neuron assistive aids
- Neurophysiology
- Bio instrumentation
- Biological Control System
- Radiation Biology
- Computational Biology & Bioinformatics
- Cancer Therapeutics Optimization

Membership

- American Association for Cancer Research (AACR)
- American Society of Clinical Oncology (ASCO)
- European society for Medical Oncology (ESMO)
- Indian Association of Cancer Research (IACR)
- Indian Academy of Neuroscience (IAN)

PERSONAL EFFICIENCY

- Commitment towards work, mentally strong, can work both as a team leader as well as a team worker and a quick learner, who is easily adaptable.

Languages: (with fluency)

English and Hindi.

Outreach:

- Volunteer with 'Playtime'- group that engages with Special Needs Children in New Delhi.
- Volunteer with 'Subhash Children Home' – an orphanage of children abandoned by parents.