

**Name:** Dr. Kuldeep Kumar

**Designation:** Assistant Professor

**Specialization:** Biotechnology & Biosensor

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### **Education**

**M.Sc. Biotechnology** (2003, Kurukshetra University, Kurukshetra),

**National Eligibility Test (NET)-2003**

**Ph.D.** (26<sup>th</sup> May, 2009, Punjabi University, Patiala)

**Title of Ph. D Thesis:** Production of L-asparaginase by recombinant *E.coli* and development of biosensor for monitoring asparagine in leukemia cells and solid tumors.

### **Professional Experience:**

Department of Biotechnology, M.M. Modi College, Patiala, India (21 July, 2008 to till date)

Department of Biotechnology, Punjabi University, Patiala India (6 October 2006 to 20 July, 2008)

### **Teaching Interests:**

- Environmental Biotechnology
- Commercial Biotechnology
- Tissue culture technology
- Bioinformatics

### **Research Interest:**

Biochemistry & Biosensor Technology, Nutrition Biology

### **Publications**

1. Neelam Verma, **Kuldeep Kumar**, Gurnoor Kaur and Sneha Anand. "E.coli K -12 Asparaginase-Based Asparagine Biosensor for Leukemia". *Artificial cells, blood substitutes, and Biotechnology* (2007). **35 (4):** 449 – 456. [Article Link](#)
2. Neelam Verma, Kuldeep Kumar, Gurnoor Kaur, Sneha Anand. "L-asparaginase: a promising chemotherapeutic agent". *Critical reviews in biotechnology*. (2007) 27(1):45-62. [Article Link](#)

3. Neelam Verma, **Kuldeep Kumar**, Gurnoor Kaur and Sneha Anand. Enhanced activity of L-asparaginase produced by genetically engineered recombinant *E.coli* cells. *Research journal of Biotechnology*. (2007) **2 (2)**: 60-63. [Article Link](#)
4. Neelam Verma, **Kuldeep Kumar**, Gurnoor Kaur and Sneha Anand. Asparagine Biosensor for Leukemia Based on L-asparaginase obtained from *Erwinia carotovora*. *National Journal of life Sciences*. (2007) **4 (1)**: 1-5. [Article Link](#)
5. Ashwani Kumar, Neelam Verma, M.I.S. Saggoo, **Kuldeep Kumar**, Vipin Kumar and Uttam Kumar. Chromosome number and morphological variability in north Indian Gokhru (*Tribulus terrestris* Linn.): A traditional Medicinal herb. *Advances in Plant Sciences*. (2008) **21(2)**: 645-648. [Article Link](#)
6. Neelam Verma, Mandeep Kataria, **Kuldeep Kumar** and Jyoti Saini. Comparative study of L-asparaginase from different cytotypes of *Withania somnifera* (L.) Dunal and its purification. *Journal of Natural Product and Plant Recourse* (2012) **2(4)**: 475-481. [Article Link](#)
7. **Kuldeep Kumar**, Teena Phathak and Shefali Walia. L-arginase Based Biosensor for Detection of L-arginine in Juice Samples. *Journal of Natural Product and Plant Recourse*. (2012) **2(4)**: 494-499. [Article Link](#)
8. **Kuldeep Kumar**, Sonika Kapoor and Diwakar Aggarwal. Common Household Spices: Alternative Source of Antimicrobial Compounds. *International Journal of Applied biology and Pharmaceutical technology*. (2012) **3(4)**: 128-132. [Article Link](#)
9. **Kuldeep Kumar** and Neelam Verma. Media Optimization for the Production of Anti-Leukemic Enzyme L-Asparaginase from *E.coli* K-12. *Annals of Biological Research*. (2012) **3 (10)**: 4828-4837. [Article Link](#)
10. **Kuldeep Kumar** and Shefali Walia. L-Asparaginase Extracted From *Capsicum annum L* and Development of Asparagine Biosensor for Leukemia. *Sensor and Transducer*. (2012) **144 (9)**: 192-200. [Article Link](#)
11. **Kuldeep Kumar**, Mandeep Kataria and Neelam Verma. Plant asparaginase-based asparagine biosensor for leukemia. *Artificial cells, blood substitutes, and Biotechnology*, (2013) **41 (3)**, 184-188. [Article Link](#)
12. **Kuldeep Kumar**, Teena Pathak and Diwakar Aggarwal. Asparagine based Plant Biosensor for Leukemia. *The Pharma Innovation Journal* (2013) **2 (10)**: 75-82. [Article Link](#)
13. Neelam Verma, Mandeep Kataria, **Kuldeep Kumar** and Jyoti Saini. TEOS hydrosol gel-chitosan matrix based biosensor for monitoring asparagine in various fruit juices. *Annals of Biological Research*. (2013) **4(1)**:265-270. [Article Link](#)

14. **Kuldeep Kumar**, Sandeep Punia, Jagjit Kaur and Teena Pathak. Development of plant asparagine biosensor for detection of leukemia. *Journal of Pharmaceutical and Biomedical Sciences*(2013) **35(35)**: 1796-1801. [Article Link](#)
15. Teena Pathak, Raman Kumar, Jagjit Kaur and **Kuldeep Kumar**. Isolation of L-Asparaginase from *Cannabis sativa* and Development of Biosensor for Detection of Asparagine in Leukemic Serum Samples *Research J. Pharm. and Tech.* (2014) 7(8):850-855. [Article Link](#)
16. Sandeep Punia , Jagjit Kaur , Raman Kumar , Mandeep Kataria and **Kuldeep Kumar**. Extraction of L-asparaginase from *Catharanthus roseus* for development of asparagine biosensor and determination of anti-microbial activity of its aqueous extract. *Current Trends in Biotechnology and Chemical Research.* (2014) 4(2):67-71. [Article Link](#)
17. Sandeep Punia, Jagjit Kaur, Raman Kumar and **Kuldeep Kumar**. Potentiometric Biosensor for Asparagine detection. *International Journal of Research in Ayurveda and Pharmacy.* (2015) 6(2): 282:284. [Article Link](#)
18. Sandeep Punia, Raman Kumar and **Kuldeep Kumar**. Enzyme based asparagine biosensor for the detection of asparagine levels in leukemic samples. *International Journal of Applied Biology and Pharmaceutical Technology.* (2015) 6(4):40-43. [Article Link](#)
19. Teena Pathak, Jagjit Kaur, Raman Kumar and Kuldeep Kumar. Development of electrochemical biosensor for detection of asparagine in leukemic samples. *International Journal of Pharmaceutical Sciences and Research.* (2016) 7(2):783-788. [Article Link](#)
20. Mandeep Kataria, Jyoti Saini, Maninder Singh, and **Kuldeep Kumar**. Isolation of catalase producing bacteria, production of catalase and its application to degrade hydrogen peroxide from effluent. *European Journal of Biotechnology and Bioscience.* (2016) 4(6): 34-37. [Article Link](#)
21. Jagjit Kaur, Raman Kumar and Kuldeep Kumar. Comparative characterization of l-asparaginase extracted from plant and microbial sources. *International Journal of Research in Ayurveda and Pharmacy.* (2017) 8(5): 86-89. [Article Link](#)
22. Aooprva Singh, Neelam Verma, Kuldeep Kumar. Screening and Identification of Medicinal plants for L-asparaginase production. *International Journal of Recent Scientific Research.* (2017) **8 (11)**: 22029-22034. [Article Link](#)
23. Jagjit Kaur, Raman Kumar and **Kuldeep Kumar**. Immobilization and characterization of L-Asparaginase extracted from Solanum Nigrum on magnetic nanoparticles. *International journal of recent Scientific Research.* (2018) 9(5): 27199-27206. [Article Link](#)

24. Aooprva Singh, Neelam Verma, Kuldeep Kumar. L-asparaginase from *Phyllanthus emblica* (Amla): a novel source. *International Journal of Pharmaceutical Sciences and Research*. (2018) 9(12): 5394-5400. [Article Link](#)
25. Diwakar Aggarwal , Preetinder Kaur and Kuldeep Kumar. Tissue Culture Propagation of High Value Ornamental Plant *Rosa hybrida* L. *Current Trends in Biotechnology and Chemical Research*. (2018) 8(1&2): 1-7 [Article Link](#)

## Review Articles

1. Neelam Verma, **Kuldeep Kumar**, Gurnoor Kaur and Sneh Anand. L-Asparaginase: A Promising chemotherapeutic agent. *Critical Reviews in Biotechnology*. (2007) **27(1)**: 45 – 62. [Article Link](#)
2. **Kuldeep Kumar** and Neelam Verma. The Various Sources and Application of L-Asparaginase: A Review. *Asian journal of biochemical and pharmaceutical research*. (2012) **2 (3)**: 197-205. [Article Link](#)
3. Shefali Walia and **Kuldeep Kumar**. Bioethanol-safe energy for the future *Current Trends in Biotechnology & Chemical Research*. (2013) **2(2)**: 87-95. [Article Link](#)
4. **Kuldeep Kumar** and Neelam Verma. L-Arginase: A medically important enzyme. *Research Journal of Pharmacy and Technology*. (2013) **6(12)**:1430-1438. [Article Link](#)
5. **Kuldeep Kumar**, Jagjeet Kaur, Shefali Walia, Teena Pathak and Diwakar Aggarwal. L-Asparaginase: An Effective Agent in the Treatment of Acute lymphoblastic Leukemia. *Leukemia and Lymphoma*. (2014) 55(2): 256-262. [Article Link](#)
6. Sandeep Punia, Jagjit Kaur, Raman Kumar and **Kuldeep Kumar**. *Catharanthus roseus*: A Medicinal Plant with potent anti tumor properties. *International Journal of Research in Ayurveda and Pharmacy*. (2014) 5(6):652-656. [Article Link](#)
7. Mandeep Kataria, Manisha Sethi, Jagjit Kaur, Sandeep Punia and **Kuldeep Kumar**. Formulation of nanoparticles against TB – A Review. *Recent Patents on Inflammation & Allergy Drug Discovery*. (2015) 9(2):1-8. [Article Link](#)

## Book Chapters

1. **Kuldeep Kumar**, Gurnoor Kaur, Ashwani Kumar and Neelam Verma (2008). Nanobiotechnology: the reliable choice of future. *Emerging Trends in Biotechnology*. I.K. International Publisher New Delhi and Scientific Publisher, Jodhpur, India.511-529. ISBN- 978-81-7233-587-8. [Article Link](#)

2. *Neelam Verma* and **Kuldeep Kumar** (2012) Asparaginase-based Asparagine Biosensors and their Application to Leukemia. *Biosensors and Cancer*. CRC Press-London.211-228 ISBN - 9781578087341. [Article Link](#)
3. Jagjit Kaur, Mandeep Kataria, Sandeep Punia, Diwakar Aggarwal and **Kuldeep Kumar** (2014) Immobilized Enzymes and Its Implications. In *Industrial Enzymes: Trends, Scope and Relevance*. Nova Science Publishers Inc, USA 73-92 ; ISBN: 978-1-63321-338-8. [Article Link](#)
4. Mandeep Kataria, Manisha, Swati, Teena Pathak, **Kuldeep Kumar** (2014) Enzyme Based Biosensors and Its Application. In *Industrial Enzymes: Trends, Scope and Relevance*. Nova Science Publishers Inc.USA. 157-172. ISBN: 978-1-63321-338-8. [Article Link](#)
5. Jagjit Kaur, Diwakar Aggarwal and **Kuldeep Kumar** (2016) Role of plant secondary metabolites in cancer cell therapy. *Research on Biotechnology in India: Some Initiatives and Accomplishments*. 245-258. New India Publishing Agency, New Delhi; ISBN – 9789385516252. [Article Link](#)
6. Mandeep Kataria, Manisha, Suninda, Diwakar Aggarwal and **Kuldeep Kumar** (2016) Advanced Wastewater Treatment Technologies. *Modern Approaches to Environmental Biotechnology*. Nova Science Publishers Inc. New York USA.35-50; ISBN: 978-1-63484-360-7. [Article Link](#)
7. Jagjit Kaur, Sandeep Punia, Teena Pathak, Mandeep Kataria and **Kuldeep Kumar** (2016) Role of Biosensors in Environmental Biotechnology. *Modern Approaches to Environmental Biotechnology*. Nova Science Publishers Inc. New York USA.195-208. ISBN: 978-1-63484-360-7. [Article Link](#)
8. Jagjit Kaur, Sandeep Punia, and **Kuldeep Kumar** (2017) Need for the advanced technologies for wastewater treatment. *Advances in Environmental Biotechnology*. Springer Nature Singapore, 39-52. ISBN 978-981-10-4040-5. [Article Link](#)
9. Jagjit Kaur, Teena Pathak, Apoorva Singh and **Kuldeep Kumar** (2017) Application of nanotechnology in the environment biotechnology. *Advances in Environmental Biotechnology*. Springer Nature Singapore.155-166. ISBN 978-981-10-4040-5. [Article Link](#)
10. Jagjit Kaur, Apoorva Singh, Teena Pathak and **Kuldeep Kumar** (2017) Role of PGRs in anticancer alkaloids (vincristine & vinblastine) production. *Catharanthus roseus - Current Research and Future*. Springer International Publishing AG. 309-319. ISBN 978-3-319-51620-2. [Article Link](#)
11. Aoorva Singh, Neelam Verma and Kuldeep Kumar (2019) Hybrid Composites: a revolutionary trend in biomedical engineering. *Materials for Biomedical Engineering :Bioactive Materials, Properties and Applications*. Elsevier United Kingdom. 33-46. ISBN: 978-0-12-818431-8. [Article Link](#)

## Conference / Seminars

### A) Resource Person / Invited Lectures:

Invited for the Judgment of the Poster Session in National Seminar and Workshop on Recent Trends in Biological Sciences in Asian Institution Patiala (23-24 February 2011)

### B) Paper presented:

1. Neelam Verma, Kuldeep Kumar and Gurnoor Kaur. “*E.coli* K -12 Asparaginase-Based Asparagine Biosensor for Leukemia Cells” in the Pittsburgh Conference – Pittcon, Orlando Florida, USA (13-16 March 2006).
2. Attended National Conference titled “Over expression-systems & challenges” at Center for Cell & Molecular Biology, Hyderabad, (26-28 November 2006).
3. Kuldeep Kumar, Teena Pathak and Diwakar Aggarwal. Asparagine based Plant Biosensor for Leukemia. International Conference on Industrial Biotechnology in Punjabi University Patiala, India (21-23 November 2012).
4. Teena Pathak, Raman Kumar and Kuldeep Kumar. Extraction of L-Asparaginase from *Canabis Sativa* and development of Biosensor for monitoring L-Asparagine level in normal and leukemia serum samples. National conference on Plant Bioresource management and Biotechnology at University of Rajasthan, Jaipur (29-31 January 2014).
5. Sandeep Punia, Teena Pathak, Raman Kumar and Kuldeep Kumar. Extraction of L-asparaginase from different medicinal plants and development of asparagine biosensor. Harnessing Engineering, Technology, and Innovation for sustainable Development Chandigarh, India (19-20 September 2014).
6. Kuldeep Kumar Bioremediation of heavy metals using the consortium constructed from different microorganisms. 2<sup>nd</sup> National conference converging Technologies Beyond 2CTB, 2020. Organised by University of institute of engineering and technology Kurukshetra University, Kurukshetra (28-29 November 2014).
7. Sandeep Punia, Raman Kumar and Kuldeep Kumar. Potentiometric biosensor for asparagine detection. 4<sup>th</sup> International Conference and Exhibition on Biosensors and Bioelectronics Atlanta, USA (28-30 September 2015).
8. Kuldeep Kumar ,Development of Asparagine biosensor medicinal plants. National conference NFCS-01, Department of Chemistry Khalsa College Patiala (15 November, 2014).
9. Kuldeep Kumar, The potential benefits of genetically modified foods. National conference on Biofuels & Bioenergy (NCBB 2015) organized by University of Petroleum & Energy Studies (UPES), Dehradun Uttarakhand (12-13 June 2015).
10. Kuldeep Kumar, Sex and Gender. National seminar on BETI BACHAO –BETI PADHAO S.A Jain (PG) College, Ambala city (12 March 2016).
11. Kuldeep Kumar, Development of plant based Asparagine Biosensor. UGC sponsored National conference on Emerging Trends in Biotechnology, A Paradigm shift to Cleaner and Greener India khalsa College, Patiala (8October 2016).
12. Kuldeep Kumar, Asparaginase plant based asparagines biosensor. RTCEMS -2018 DAV College, Abhor (24 January 2018).

13. Ashish Kumar Singh, Kuldeep Kumar and Neelam Verma. Biosensors based on plants tissue: Advancement features. Races-10<sup>th</sup> M.M.Modi College, Patiala Punjab (11-12 April 2019).

### **C) Attended**

1. International conference on Harnessing Engineering, Technology and Innovation for Sustainable Development. Panjab University Chandigarh (19-20 September, 2014).
2. National conference on Emerging Challenges in Biotechnology. Chandigarh Group of Colleges, Landran (21-22 August 2015).

### **Webinar**

3. Attended webinar on Nanotechnology for Environmental Remediation. DAV College, Abhore Punjab (2 June 2020).
4. Attended “One Day International Webinar on COVID-19: Challenges and Solutions” (IWCCS-2020-21). D.B.F. Dayanand College of Arts & Science, Solapur, MH, India (06 July 2020).
5. Attended “Webinar on Biotechnological Applications. Sona College of Arts and Science, Salem (8 July 2020).
6. Attended “International webinar on Recent Innovations in Applied Microbiology”. Noorul Islam College of Arts and Science, Tamilnadu (9 July 2020).
7. Attended webinar “Repurposable Anti-COVID-19 Drugs”. KIIT-Technology Business Incubator (11 July 2020).
8. Attended webinar on “Pandemic Leadership: Science and Gender”. Amity University, Noida (18 July 2020).

### **Ph.D Students**

1. Mandeep Kataria (**Completed**)- Screening of *Withania Somnifera* (L) Dunal plants for L-Asparaginase and development of Asparagine Biosensor.
2. Teena Phathak (**Completed**)- “Production of L-Asparaginase from *Cannabis sativa* and Development of Biosensor for Monitoring Asparagine in Leukemia Cells”.
3. Sandeep Punia (**Completed**)- “Screening of Medicinal Plant for Development of Asparagine Biosensor”.
4. Jagjit Kaur (**Completed**): Comparison of plant and microbial L-asparaginase through Controlled Drug Delivery (CDD)
5. Apoorva Singh: (**On-going**) “Fabrications of nanoparticles from plant extract of *Catharanthus roseus* and its application in cancer treatment”.

6. Dhamnita Singh (NET) (**On-going**) Molecularly imprinted polymer and quantum dots embedded molecularly imprinted polymer sensor to detect chlorpyrifos.
7. Gurloveen Kaur (CSIR-JRF) (**On-going**) Green synthesis of quantum dots for the development of sensor to detect heavy metals in environmental samples.
8. Jaspreet Kaur (**On-going**) Nanoparticle based plant biosensor.

### **M.Sc Dissertations:**

65 (Completed, 2006-2020) and 07(On-going)

### **Workshops and training courses**

1. Attended Patent Awareness Workshop Thapar Institute of Engineering and Technology, Patiala (30 September 2005).
2. Attended 14<sup>th</sup> Annual conference of Association of Biology teachers Post Graduate Govt. College for Girls Sectors 42, Chandigarh (27 March 2011).
3. Attended IPRS Awareness Workshop Organized by Department of Biotechnology, GSSDGS Khalsa College Patiala (27 January 2012).
4. Attended XV Annual conference of Association of Biology teachers Post Graduate Govt. College for Girls Sectors 42, Chandigarh (22 April 2012).
5. Attended 14<sup>th</sup> Orientation Course at Academic Staff College, Punjabi University, Patiala. (1-27 October, 2012).
6. Attended Two days workshop in recent technique in Mol. Biology, Immunology, Microbiology, Bioformatics & Clinical Pathology, Organized by Biotech Study & Research Center Biosoc Society Department of Biotechnology at Maharishi Markandeshwar University Mullana (25-26 February 2013).
7. Attended Refresher Course (Environmental Studies: Biotechnology) at Academic Staff College, Punjabi University, Patiala. (6-25 May, 2013)
8. Attended UGC Sponsored Faculty Development Program at Multani Mal Modi College, Patiala. (1-15 July, 2014)
9. Attended UGC Sponsored Faculty Development Program at Multani Mal Modi College, Patiala. 9-15J July, 2015)
10. Attended UGC Sponsored Faculty Development Program at Multani Mal Modi College, Patiala. (9-16 January, 2017)

11. Attended Faculty Development Program (Emerging issues & challenges in higher education) at Multani Mal Modi College, Patiala (17-12 July, 2019).
12. Attended Workshop on “Science Leadership Workshop”. Central University of Punjab, Bhatinda (22-28 June 2020). **[Online]**
13. Two Weeks Online Short Term Training Programme On Research Methodology. University School of Information And Communication Technology Gautam Buddha University, Greater Noida, U.P., India (06-18 July 2020). **[Online]**
14. Participated in the Two Days National Workshop titled “Blended Learning Approaches in Teaching” (WS-BLAT) organized by Microbiologist Society, India. (17-18 July, 2020). **[Online]**

### **Achievements, Awards and Recognitions**

- **Research Project-** Development of Biosensor for monitoring L-Asparagine in clinical & food samples – Funded by UGC, New Delhi.
- Coordinator national conference on ‘Recent Advances in Chemical and Environmental Sciences’ (RACES-2009), January 16-17, 2009.
- Organized 2<sup>nd</sup> national conference on ‘Recent Advances in Chemical and Environmental Sciences’ (RACES-2010), January 22-23, 2010.
- Organized 3<sup>rd</sup> national conference on ‘Recent Advances in Chemical and Environmental Sciences’ (RACES-2011), February 28 – March 01, 2011.
- Organized national Symposium on ‘Emerging Trends in Biotechnology’ (NSETB-2012), February 24, 2012.
- Organized 6<sup>th</sup> national conference on ‘Recent Advances in Chemical and Environmental Sciences’ (RACES-2013), November 13-14, 2013.
- Organized 7<sup>th</sup> national conference on ‘Recent Advances in Chemical and Environmental Sciences’ (RACES-2015), January 30-31, 2015.
- Organized 8<sup>th</sup> national conference on ‘Recent Advances in Chemical and Environmental Sciences’ (RACES-2016), February 19-20, 2016.
- Organized 2<sup>nd</sup> national Symposium on ‘Emerging Trends in Biological Sciences’ (NSETB-2016), November 12, 2016.
- Organized 9<sup>th</sup> national conference on ‘Recent Advances in Chemical and Environmental Sciences’ (RACES-2018), February 9-10, 2018.
- Organized 3<sup>rd</sup> national conference on ‘Innovations in Bioscience and Technology’ (NCIBT-2020), March 07, 2020.

- Organized ‘Workshop on Plant Tissue Culture.’ (September 22-23, 2014).
- Organized ‘1<sup>st</sup> Workshop on Modern Techniques in Sciences.’ (July 11-20, 2016).
- Organized ‘2<sup>nd</sup> Workshop on Modern Techniques in Biological Sciences.’ (July 21- August 01, 2017).
- Organized ‘3<sup>rd</sup> Workshop on Modern Techniques in Biological Sciences.’ (July 31- August 06, 2018).
- Organized ‘4<sup>th</sup> Workshop on Modern Techniques in Biological Sciences.’ (July 27- August 05, 2019).
- Organized **Five Cafeteria including Diet Clinic** etc
- Assistant Registrar (House Examinations) since January 2017 to till Date
- External Evaluations and reviewer – Evaluated and reviewed M.sc/M. Tech Thesis, **Two Poland Project**, four international & national Research journals

## Resources Developed

*Link of video lecture*

## Membership

- Member Board of Under Graduate Studies Department of Biotechnology, Punjabi University, Patiala (05 February, 2016 to 27 December, 2017).
- Member Board of Post Graduate Studies Department of Biotechnology, Punjabi University, Patiala (05 February, 2016 to 27 December, 2017).
- Member Board of Under Graduate Studies Department of Biotechnology, Punjabi University, Patiala (28 November, 2017 to 27 December, 2019).
- Member Board of Post Graduate Studies Department of Biotechnology, Punjabi University, Patiala (28 November, 2017 to 27 December, 2019).
- Member Board of Studies Faculty of Life Sciences, Punjabi University, Patiala (09 April, 2019 to 11 January, 2021).
- Member Board of Under Graduate Studies Department of Biotechnology, Punjabi University, Patiala (03 January, 2020 to 27 December, 2021).

- Member Board of Post Graduate Studies Department of Biotechnology, Punjabi University, Patiala (03 January, 2020 to 27 December, 2021).
- Biotech Research Society of India (BRSI)- Life Member.
- Association of Biology teachers (Punjab Chapter)- Life Member
- Biotechnology Society, Department of Biotechnology, Punjabi University, Patiala- Life Member