

## PROFILE



### **DR. RAJU SHANKARAYAN**

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#### **OFFICIAL ADDRESS**

Associate Professor, School of Biotechnology, Shri Mata Vaishno Devi University Katra (J&K) Pin- 182320

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**Date of Joining:** 11/10/2012

**Qualifications:** B.Pharm., M.Tech., Ph.D.(IIT Delhi, Biochemical Engg. & Biotechnology), GATE, UGC-NET, CSIR-JRF, IITD-SRF

**Area of Specialization:** Sustained drug delivery, Nanoparticulate drug delivery, Drug transport through mucosa

**Research Interest:** Polymeric biomaterials based drug delivery, Pharmacokinetics, New drug discovery from Natural Products, Homeo and Naturo-therapy for incurable diseases, Environmental Nano/Bio-remediation.

#### **ACADEMIC QUALIFICATIONS**

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July2003 – June 2010    **Ph.D.**, Department of Biochemical Engineering and Biotechnology, **Indian Institute of Technology Delhi**, New Delhi.

July2001- Jan 2003    **M.Tech in Biotechnology**, Centre For Biotechnology, Anna university, Chennai.  
(**C.G.P.A- 8.962/10, 1<sup>st</sup> Div., DISTINCTION**)

July 2000-June 2001    **Diploma in sales and Market Management** from London College of Management conducted by Sion Education Trust Mumbai in association with Novartis India Ltd (a Swiss based Pharma Company)

July1995 - June2000    **B.Pharma**, Muzaffarpur Institute of Technology, BRA Bihar university, Muzaffarpur.  
(**75.4 %, 1<sup>st</sup> Div., DISTINCTION**)

June 1993    Class **XII** (BIEC, PATNA)  
(**68.7 %, 1<sup>st</sup> Div., DISTINCTION IN PHYSICS**)

June 1991    Class **X** (BSEB, Patna)  
( **77.7 %, 1<sup>ST</sup> DIV.**)

#### **WORK EXPERIENCE**

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Oct 2024- Till date	<b>Associate Professor, Shri Mata Vaishno Devi University Katra (J&amp;K)</b>
Oct 2012- Oct 2024	<b>Assistant Professor, Shri Mata Vaishno Devi University Katra (J&amp;K)</b> Involved with teaching of various subjects from Engineering and Sciences disciplines (Biochemical engineering, Bioprocess Technology, Chemical Engineering Thermodynamics, Biopharmaceutical Engineering, Fundamentals of Physical chemistry, Biostatistics, Drug Delivery and Pharmacokinetics, Intermediary Metabolism etc) to B.Tech. Biotechnology and B.Sc.-M.Sc. Integrated Biotechnology students and supervising M.Sc. and Ph.D. Scholars.
July 2010-Sep 2012	<b>Research Associate at NanoScale Research Facility, IIT Delhi.</b> Project Title: “Non-Silicon Based Technologies for Nanofabrication and Nanoscale Devices”.
July 2003-June 2010	<b>Teaching Assistant</b> <b>Indian Institute of Technology Delhi, New Delhi, India</b> Associated with teaching, project and practical work of undergraduate and postgraduate students of the department (Biochemical Engineering and Biotechnology) during PhD work at IIT Delhi.
July 2002 – Dec 2002	<b>M.Tech. Dissertation</b> <b>Centre for DNA Fingerprinting and Diagnostics, Hyderabad,</b> “Evaluation of structure based amino acid substitution scoring matrices” and “Homology modeling of a putative transcriptional regulatory protein of <i>Synechococcus elongatus</i> .”
July 2000-June 2001	Worked as <b>Marketing and Sales executive</b> at Ranchi, Jharkhand in <b>Novartis India Ltd</b> (a Swiss based Pharma Company)
Oct 1999- Nov 1999	<b>B. Pharma Dissertation</b> <b>Indian Institute of Toxicology Research, Lucknow, India.</b> “Systematic Analysis of root of <i>Jatropha gossypifolia</i> (a plant of medicinal value)”
Vocational Training (B. Pharma)	<b>East India Pharmaceutical works ltd., kolkata, India</b> Manufacturing of different pharmaceutical doses forms (syrup, capsule, tablet, ointment and injection).

## UNIVERSITY ACADEMIC AND MANAGEMENT RELATED ACTIVITIES

(at Shri Mata Vaishno Devi University Katra)

Involved with following services:

- ‘Centre For Nanotechnology’ draft proposal Committee
- Advisory Committee member of UGC, SAP, DRS-I Project
- Web (audio/video) Courses availability co-ordinator for SBT
- Media and Report preparation committee for the workshop of BIRAC, DBT at SMVDU

Involved with following Departmental/University committees:

- Course Allocation Committee (Convenor) (Jan 2013 onward-till date)
- TIME Table preparation Committee (Convenor) (Jan 2013 onward-till date)
- Esamarth Coordinator (2022-till date)
- MOOC (Massive Open Online Courses) Coordinator (2013-2020)
- MOODLE-LMS (Modular object oriented dynamic learning environment- Learning Management System) Coordinator (2014-2016 & 2019-2022 which was all tenure of implementation)
- ERP (Enterprise Resource Planning) Coordinator (2016-2019, for whole tenure of implementation)
- Exam date-sheet preparation for B. Tech., M. Sc. & Ph. D.(2013-2015)
- Board of Studies meeting Committee (2013-14, 2014-15)
- B.Tech. Course modification committee (2014-15)
- UG/PG Prospectus Committee (2013-14, 2014-15)
- Ph.D. admission committee (2015-2016)
- M.Sc. admission committee (2020-till date)
- Maintenance of Block A (2013-22)
- Molecular Biology Lab, COS in-charge (2013-18)
- University Transport Committee (2016-22)
- Students Mentor (2013-24)

### **ACADEMIC ACHIEVEMENTS AND AWARDS (DURING STUDY)**

- **Institute Doctoral Research Fellowship (SRF)** and Teaching assistantship, awarded by Indian Institute of Technology Delhi (For 5 years- from July 2003 to June 2008).
- Awarded **JNU-JRF scholarship** for M.Tech. programme in Biotechnology at Centre for Biotechnology, Anna university, Chennai, India.
- Secured All India Rank 3rd in the **Combined Entrance Examination for Biotechnology (CEEB, 2001)**, DBT-supported, conducted by JNU, New Delhi for admission in M.Tech. Biotechnology program at Anna university, Chennai.
- Selected for Junior Research Fellowship (JRF) by **CSIR JRF-NET (Dec 2002)**.
- Selected for National eligibility test for lecturereship by **UGC-NET (July 2002)**.
- Qualified 2 times for **Graduate Aptitude Test for Engineers (GATE 2000 and 2001)**.
- Secured 2<sup>nd</sup> rank in **Bihar Combined Engineering Entrance Examination (BCEEE 1995)** for admission in B. Pharma.

## **ACHIEVEMENTS/ACTIVITIES PERFORMED (DURING SERVICE):**

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### **Participation in Workshops/seminars/Conferences recognized by National /International Professional bodies:**

- Participated and successfully completed the UGC-Approved **8-Days Online Training Program on “NEP Orientation & Sensitization”** conducted by **UGC-Malaviya Mission Teacher Training Centre (MMTTC)- Shri Mata Vaishno Devi University, Katra (J&K)** from 8<sup>th</sup> Jan to 17<sup>th</sup> Jan 2024.
- Participated and successfully completed the UGC-Approved **36 hour equivalent to 6 days Short Term Professional Development Programme on ‘Implementation of NEP-2020 for University and College Teachers’** conducted by IGNOU New Delhi Under Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching, held from 12-20 June, 2023 and obtained ‘A+’ Grade.
- Attended **One Week Faculty Development Programme on “Teaching and Research Practices” (Hybrid Mode)** 05-10 June 2023, organised by Department of Biotechnology & Bioinformatics at Jaypee University of Information Technology, Waknaghat, H.P.
- Co-chaired Session in International Conference on Emerging Trends in Biosciences and Chemical Technology (ETBCT-2022) held at Shri Mata Vaishno Devi University, Katra, J&K in collaboration with CSIR-IIIM Jammu and BRSI, India from 3rd December to 5<sup>th</sup> December 2022.
- Attended A five day Online workshop for Teachers in Higher Education on **“Life Skills Management for Teachers”** organized by Faculty Development Centre, SMVDU Katra from 27<sup>th</sup> December to 31<sup>st</sup> December 2021.
- Attended One Day Online Workshop at Faculty Development Centre on the theme **" Waste Management in Residential Society"** on 17 Dec 2021 organised by Faculty Development Centre (under PMMMNMST Scheme) in collaboration with the School of Mechanical Engineering at SMVDU Katra.
- Attended 5 days Online workshop on **"AICTE Incorporating Universal Human Values in Education (An AICTE Initiative)"** from 6-10 December 2021.
- Attended the one day workshop on **NEP 2020: The Educational Outcomes of 21st Century Schools** (30th October, 2021) Organized by Faculty Development Cell-Shri Mata Vaishno

Devi University (J&K) under Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNTT) Scheme

- Attended two week Interdisciplinary Refresher Course on “**Advanced Concepts in Developing Moocs**” organized by Ramanujan college, **University of Delhi** in collaboration with Devangiri University Karnataka under the auspices of PANDIT MADAN MOHAN MALAVIYA NATIONAL MISSION ON TEACHERS AND TEACHING from 06<sup>th</sup> October to 20<sup>th</sup> October 2021.
- Attended One-Week Online Faculty Development Program on “**Mathematics and Its Application in Science and Engineering**” organised by Faculty Development Centre, SMVDU Katra from 27<sup>th</sup> September to 1<sup>st</sup> October 2021
- Attended the online webinar on “**Ozone Depletion and Environmental Education with special Reference to Indian Culture**” conducted by Comparative Religions and Civilizations (CCRC), Central University of Jammu on 16<sup>th</sup> September, 2020.
- Participated and successfully completed the one week online course on “**Community University Engagement: Moving towards engaged Teaching, Research and Service**” offered by PRIA International Academy (PIA) in partnership with Association of Indian Universities from 18 to 22nd May 2020.
- Given Certificate of Appreciation for volunteering time and effort in the organization of **International Conference on Applied Biology (ICAB-2019) & first Annual Convention of Society of Biologists** held at Shri Mata Vaishno Devi University, Katra, J&K-India from 4<sup>th</sup>-6<sup>th</sup> November, 2019.
- Participated and Co-chaired Session in **International Conference on Applied Biology (ICAB-2019) & first Annual Convention of Society of Biologists** held at Shri Mata Vaishno Devi University, Katra, J&K-India from 4<sup>th</sup>-6<sup>th</sup> November, 2019.
- Attended **Faculty Development Program on Energy & Power Systems** held at School of Energy Management, Shri Mata Vaishno Devi University, Katra (J&K) from 05<sup>th</sup> Aug 2018 to 09<sup>th</sup> Aug, 2019.
- Attended two weeks **Sanskrit workshop** conducted at SMVDU Campus to learn the basics of Sanskrit Language, Nov 2019.

- Participated in One day National Workshop/Seminar on Bioinformatics on **“Trends in Genomics and Proteomics”** organised by SMVDU Katra on 29th March 2019.
- Participated in one week workshop on **“Pedagogy“ conducted and organised by Faculty Development Centre, SMVDU Katra** under Pandit Madan Mohan Malaviya National mission on Teachers and Teaching (PMMMNTT) scheme of MHRD, GOI, from 11th- 15th March 2019.
- Participated and successfully completed two week long DST-NIMAT Project sponsored **Faculty Development Program on “Entrepreneurship Development”** organized by Entrepreneurship Development Cell, Shri Mata Vaishno Devi University, Katra (J&K) from 10<sup>th</sup> Dec 2018 to 21<sup>th</sup> Dec, 2018.
- Successfully completed the **Three month course entitled Certification in French (Basic) organised by the School of Language and Literature, SMVD University Katra**, from 20 Sep 2018 to 20 Dec 2018.
- Participated and successfully completed two week Refresher Course on **“Introduction to MATLAB and Research Enhancement Tools” funded by TEQIP-III and supported by Math Works India**, organized by School of Electronics and Communication Engineering in collaboration with Human Resource Development Centre, Shri Mata Vaishno Devi University, Katra (J&K) from 20<sup>th</sup> Oct 2018 to 29<sup>th</sup> Oct, 2018.
- Successfully participated in One day seminar on **“Raman Spectroscopy and Micro Array Printing”** organized by School of Biotechnology, Shri Mata Vaishno Devi University, Katra on 20<sup>th</sup> August, 2018.
- Participated and successfully completed Faculty Development Program on **“Effective Teaching Learning in Higher Education”** organized by School of Architecture and Landscape Design (SALD) in collaboration with School of Philosophy and Culture (SoPC) at Shri Mata Vaishno Devi University, Katra from 4<sup>th</sup>-6<sup>th</sup> July, 2018.
- Participated and successfully completed an AICTE approved **Faculty Development Program (FDP201x) on “Pedagogy for Online and Blended Teaching-Learning Process”** conducted by Indian Institute of Technology Bombay from 3<sup>rd</sup> May 2018 to 30<sup>th</sup> May, 2018.
- Participated in the scientific deliberations as a **“Session Chair” in National Conference on Renewable energy and Sustainable Environment: Challenges and Remedies (CRESE-**

**2018)** held at School of Energy Management, Shri Mata Vaishno Devi University, Katra during 24-25 April, 2018.

- Successfully completed an **AICTE approved Faculty Development Program (FDP101x) on “Foundation Program in ICT for Education”** conducted by Indian Institute of Technology Bombay from March 8, 2018 to April 12, 2018.
- Participated in the **6<sup>th</sup> three-week Special Summer School organised by the UGC-HRDC, Jamia Millia Islamia, New Delhi** from 29<sup>th</sup> May to 17<sup>th</sup> June 2017
- Participated in the J&K State Science, Technology and Innovation Council sponsored one day workshop on **“Scientific Innovation and Intellectual Property Rights”** on 27<sup>th</sup> March 2017, organised by Department of Biotechnology, Shri Mata Vaishno Devi University, Kakryal, Katra (J&K).
- Participated in **Bioinformatics workshop on Molecular Visualization and Drug Discovery organised by Department of Biotechnology**, Shri Mata Vaishno Devi University on 17<sup>th</sup> March 2017 sponsored by DST, DBT, GOI.
- Acted as Session Chair of the 3<sup>rd</sup> International conference on **Recent Trends and Advancements in Engineering and Technology (ICRTAET)** organised by Shri Mata Vaishno Devi University, Katra during 17-18 November, 2016
- Attended one day workshop on **“Patent Drafting and Filing” organised by Department of Biotechnology**, SMVDU Katra in association with Technology Information, Forecasting and Assessment Council (TIFAC), Department of Science and Technology (DST), Govt. of India on 20<sup>th</sup> October 2016.
- Attended two week Faculty Development Programme on **“Carving human Resource: Approaches & Procedures”** sponsored by the All India Council of Technical Education, Government of India organised by School of Business, Faculty of Management, Shri Mata Vaishno Devi University, Kakryal, Katra (J&K) from 21<sup>st</sup> Dec 2015 to 3<sup>rd</sup> Jan 2016.
- Participated in National conference on **‘Orchids science and commerce:integration of medicinal orchids, sustainable development and societal benefits’**, organized by The orchid Society of India jointly with School of Biotechnology, SMVDU, Katra wef Feb 13-15, 2015.
- Attended the Science Academies’ **interdisciplinary lecture workshop: Physics of**

**Earthquakes and Hazard Analysis**, which was organized by School of Innovation and Community Development and School of Physics, SMVDU Katra from 27-05-2014 to 29-05-2014

- Attended **Four weeks UGC 90<sup>th</sup> Orientation Programme conducted by University of Rajasthan, Jaipur** from 11.11.2013 to 7.12.2013.
- Attended **2 weeks Faculty Development Programme on “Applications of Econometrics and Times Series Techniques in Business”** from 20<sup>th</sup> May, 2013 to 2<sup>nd</sup> June, 2013 at College of Management, SMVDU.
- Participated in **2-day ISTE workshop on "Aakash for education"** conducted by **IIT Bombay** at our remote Centre SMVDU with the use of Virtual Class room tool (AVIEW) on 10th and 11th November 2012.

**Presented Research Papers in Workshops/Seminars/Conferences conducted or recognized by Professional agencies:**

- Presented Paper on Title: “Synthesis of Green Nanomaterials using Plant Extract”, in International Conference on Biological Sciences for Sustainable Future (ICBSSF 2023) on 15<sup>th</sup> & 16<sup>th</sup> December 2023 organized by School of Biotechnology and Bioinformatics, D Y Patil Deemed to be University, Navi Mumbai, India
- Presented Paper on Title: “Green Nanomaterials: Their Synthesis and Applications”, in International Conference on Recent Trends in Commerce, Management, Science and Engineering (ICCMSE 2023) on 25<sup>th</sup> & 26<sup>th</sup> November 2023 (Hybrid Mode) Jointly Organized by Maharani Cluster University (MCU), Bengaluru, Karnataka, India & RSP Conference Hub, Coimbatore, Tamilnadu, India
- Presented Paper on Title: “Strategies Required for Promotion in Non-Conventional Energy Sources” in 4<sup>th</sup> World Environment Summit 2023 on 4<sup>th</sup> & 5<sup>th</sup> November 2023 organised by Environment and Social Development Association (ESDA) at Conference Centre, University of Delhi, North Campus, Delhi (India)
- Delivered Invited talk entitled “Genetically Modified Crops: Their Development, Potential Uses and Associated Risks” in the 10<sup>th</sup> International Conference on “Role of Science and



Technology in Sustainable Development” conducted by Him Science Congress Association (HSCA) on 13-14<sup>th</sup> October 2023 at Hotel Moonglade, Banikhet Dalhousie, HP, India

- Presented Paper on Title: “Production of Bioenergy from Agro-waste: A sustainable and a Viable Approach” at International Conference on Emerging Trends in Biosciences and Chemical Technology (ETBCT-2022) held at Shri Mata Vaishno Devi University, Katra, J&K in collaboration with CSIR-IIIM Jammu and BRSI, India from 3rd December to 5<sup>th</sup> December 2022.
- Jyotsna Sharma, Savita Sharma, **Raju Shankarayan**, and Sharda Mallubhotla, Presented paper in National Seminar on increasing participation of women in science and technology organized by Hans Raj Mahila Mahavidyalaya, Jalandhar in collaboration with National commission for women, Govt. of India; 16<sup>th</sup> March, 2019, Title: “Development of *in vitro* conservation protocol and confirmation of traditionally acclaimed medicinal properties of less explored medicinal herb *Nanorrhinum ramosissum*”(Candidate was awarded Young Scientist Appreciation award for the oral presentation on her research work).
- Jyotsna Sharma, Savita Sharma, **Raju Shankarayan**, and Sharda Mallubhotla, presented a paper at International Conference on recent advances in interdisciplinary sciences organized by Department of Electronics, University of Jammu; 11-12 January, 2019. Title: “Exploration of the traditionally acclaimed less explored herb: *Kickxia ramosissima*”, PP. 122.
- **Raju Shankarayan**, Presented Paper in 2 days National Conference on Renewable energy and Sustainable Environment: Challenges and Remedies (CRESE-2018) held at School of Energy Management, Shri Mata Vaishno Devi University, Katra from April 24 to April 25, 2018. Title: Bioenergy: Means of Production and a Critical Analysis, PP:51.
- **Raju Shankarayan**, Presented Paper at Special Summer School organised by the UGC-HRDC, Jamia Millia Islamia, New Delhi; 16<sup>th</sup> June 2017. Title: Alternative Therapies in India.
- Kirti Sharma, **Raju Shankarayan**, National Symposium on “Recent Trends in Biotechnology and Drug Discovery” organized by Department of Biotechnology at SMVDU, Kakryal, J&K; 30-31 March 2017. Title: “Preparation and Optimization of Streptomycin loaded Chitosan Nanoparticles”PP:60.
- Priya Kaw and Anamika Khajuria, **Raju shankarayan**, National Symposium on “Recent

Trends in Biotechnology and Drug Discovery” organized by Department of Biotechnology at SMVDU, Kakryal, J&K; 30-31 March 2017. Title: “Synthesis of sustained release nanoformulation of Bacitracin using Chitosan as a polymer”PP:77.

- **Raju Shankarayan**, An oral presentation in International Conference on Renewable Energy for Sustainable Environment: Challenges and Remedies (ICRESE- 2017) organized by School of Energy Management, at SMVDU, Kakryal, J&K; 20-21 March 2017. Title: Nanotechnology: a boon for solving world energy problem, PP:55.
- Jyotsana Sharma, Manoj Kumar, Saurabh Sharma, Anuja Koul, Savita Sharma, **Raju Shankarayan**, Mohita Sharma, Vinay Kumar and Sharda Mallubhotla, National Conference on recent advances in Materials Science and spectroscopy (NCRAMSS-2017) organized by Dept. of Physics, SMVDU in collaboration with Laser and Spectroscopy society of India from 15<sup>th</sup> to 17<sup>th</sup> February 2017. Title: Characterization and antimicrobial activity analysis of silver nanoparticles synthesized from field grown and in vitro regenerated shoots of *Kickxia Ramosissima*, PP:53.
- Jyotsana Sharma, **Raju Shankarayan**, and Sharda Mallubhotla; National conference on “Emerging Trends in Biotechnology for Agriculture, Medicine and Environment” at Mahila P.G. Mahavidyalaya, Jodhpur from 18-19 November 2016. Title: High frequency in-vitro regeneration system for conservation of *Kickxia Ramosissima* (Wall) Janch: a medicinally important herb.
- Jyotsana Sharma, Saurabh Sharma, Anuja Koul, Savita Sharma, **Raju Shankarayan**, and Sharda Mallubhotla; J&K women Science congress at Govt. college for Women, Gandhi Nagar, Jammu from 1<sup>st</sup> to 3<sup>rd</sup> September 2016. Title: Effect of Nutrients supplements on In-vitro regeneration in *Kickxia Ramosissima*.
- Jyotsana Sharma, Anuja Koul, **Raju Shankarayan**, and Sharda Mallubhotla; National conference on advances in Agricultural sciences and Biotechnology at DAV Jalandhar on 28 Feb 2015. Paper Title: In vitro flowering and plantlet regeneration in *Kickxia Ramosissima*-A medicinally important plant.

### **Papers Published in International Journals:**

- Anu Bharti, Richa Kothari, Shruti Chib, Deepak Pathania, **Raju Shankarayan**; Impact of stationary Algal Biofilm Adhesion on Substrate’s Surface for Biomass Harvesting and

Treatment of Wastewater: Experimental Investigation; Malaysian Journal of Chemistry, March 2024, Vol. 26(3), pp 134-140 (Scopus)

- Jyotsna Sharma, Anuja Koul Savita Sharma, Sharda Mallubhotla, **Raju Shankarayan**; Bioactivity evaluation of least explored traditionally acclaimed medicinally potent herb *Nanorrhinum ramosissimum* (Wall.) Betsche; Brazilian Journal of Pharmaceutical Sciences, 2023; 59: e19334, pp 1-14 (SCI-E)
- Jyotsna Sharma, S. Mallubhotla, R. Tupe, **R. Shankarayan**, Inhibition of glycation and multiple marker analysis using extracts of *Nanorrhinum ramosissimum* (Wall.) Betsche: An under investigated plant species; AMA, Agricultural Mechanization in Asia, Africa and Latin America; Volume 52, Issue 01, October, 2021, pp 2171-2178 (SCI-E)
- Jyotsna Sharma, Anuja Koul Savita Sharma, **Raju Shankarayan** Sharda Mallubhotla; In vitro propagation of *Nanorrhinum ramoissimum* (Wall.) Betsche: A traditionally important; Kuwait Journal of Science; Vol.48, No.(3), 2021, pp 1-10 (SCI-E)
- Jyotsna Sharma, Savita Sharma, **Raju Shankarayan**, Sharda Mallubhotla; Enhancement of Solasodine Content using Signal molecules in Shoot Cultures of *Solanum Nigrum*; Plant Cell Biotechnology and Molecular Biology; 22 (11 & 12), 2021, pp 136-142 (SCOPUS)
- Shamshad Ahmad, Richa Kothari, **R. Shankarayan**, V.V.Tyagi, Temperature dependent morphological changes on algal growth and cell surface with dairy industry wastewater: an experimental Investigation. 3-Biotech, 1-12, 10:24 (2020), Springer.
- Richa Kothari, Shamshad Ahmad, Vinayak V. Pathak, Arya Pandey, Ashwani Kumar, **Raju Shankarayan**, Paul N. Black & V. V. Tyagi, Algal-based biofuel generation through flue gas and wastewater utilization: a sustainable prospective approach, Biomass Conversion and Biorefinery, 1-24 (2019), Springer-Verlag GmbH Germany, part of Springer Nature.
- **R. Shankarayan** and P. Mishra, Permeation Behaviour of Lysozyme-Loaded Poly(Lactic-co-Glycolic Acid) Nanoparticles Through Porcine Oesophageal Mucosa and Its Microscopic Study, Journal of Nanopharmaceutics and Drug Delivery, 3(1), 85-96 (2016), American Scientific Publisher.
- **R. Shankarayan**, S. Kumar and P. Mishra, Differential permeation of piroxicam-loaded PLGA micro/nanoparticles and their in vitro enhancement. Journal of Nanoparticle Research, 15(3), 1-13 (2013), Springer.

### **Book Chapter Publications:**

- Jyotsna Sharma, Vivek K. Singh, Anil Kumar, **Raju Shankarayan** and Sharada

Mallubhotla. Role of Silver Nanoparticles in Treatment of Plant Diseases In: Microbial Biotechnology: Application in Food and Pharmacology, Volume 2; Eds. Jayanta Kumar Patra, Gitishree Das and Han-Seung Shin; Springer Science, 2018.

**Ph.D. Degree awarded to students under my guidance:**

Jyotsna Sharma (Entry No.-13PHDSBT05) was awarded Ph.D. Degree on 9th August 2021 on the Topic: “Studies on Regeneration, Biochemical Profiling And Bioactivity Analysis In Selected Medicinal Plant Species”. For her Research work (in Ph.D.) and the presentation, she was awarded with “**Young Scientist Award**” in the “National Seminar on Increasing Participation of Women in Science & Technology” organized by the Equal Opportunity Cell, Hans Raj Mahila Maha Vidyalaya, Jalandhar, in collaboration with National Commission for Women, Govt. of India on March 16, 2019.

**Massive Open Online courses (MOOCs) Completed**

S. no.	Date of training	Course title	University / Institute	Outcomes
1	Aug-Sep 2023	Stanford Introduction to Food And Health	Stanford University	Successfully completed with 100 % marks
2	July-Aug 2022	Introduction to Molecular Spectroscopy	University of Manchester	Successfully completed with 86 %
3	April-June 2022	Introduction to Physical Chemistry	University of Manchester	Successfully completed with 90 %
4	July-Sep 2020	“Drug discovery”	UC San Diego	Successfully completed with 95.45 %
5	July-Sep 2020	“Chemistry”	University of Kentucky	Successfully completed with 95.71 % marks
6	Feb - March 2020	“Bioenergetics of Life Processes”	NPTEL Course conducted by IIT Kanpur	Successfully completed with 97 % marks
7	Jan-Feb 2019	“Human Molecular Genetics”	NPTEL Course conducted by IIT Kanpur	Successfully completed with 75 % marks (Elite Certification provided)

