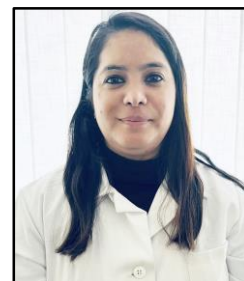


Anita Rana, M.Sc., Ph.D.

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EDUCATION

- | | | |
|--------------|--|------------------|
| Ph.D. | Kumaun University, Nainital, Uttarakhand, India
Prof. Rajendra Singh, Nanoscience & Nanotechnology
Centre Department of Chemistry, D.S.B. Campus,
Nainital, Uttarakhand, India | 2016-2022 |
| | Thesis Title: “ Phytochemical screening of <i>Juniperus squamata</i> and <i>Apium graveolens</i> along with their comparative bioactivities by incorporating carbon nanomaterial ” | |
| | Discipline: Chemistry
(Research Advisor: Prof. Nanda Gopal Sahoo, FRSC) | |
| M.Sc. | Kumaun University, Nainital, Uttarakhand, India
Department of Chemistry, D.S.B. Campus, Nainital, Uttarakhand, India
Discipline: Chemistry | 2011-2013 |
| B.Sc. | Kumaun University, Nainital, Uttarakhand, India
D.S.B. Campus, Nainital, Uttarakhand, India
Discipline: Zoology, Botany, Chemistry | 2009-2011 |

CURRENT POSITION

- ❖ Postdoctoral Researcher at Polymer Institute, Slovak Academy of Science, Bratislava.

RESEARCH EXPERIENCES

UNESCO/IUPAC Researcher	Institute of Macromolecular Chemistry Czech Academy of Science, Prague, Czech Republic Project entitled “ Branched, multifunctional poly(2-oxazolines)s for polymer-drug conjugates ”	1.10.2023-31.07.2024
Senior Research Fellow (SRF)	Department of Biosciences & Bioengineering, Indian Institute of Technology (IIT), Roorkee, Uttarakhand, India Project Title: “ Fabrication of bioabsorbable rigid internal fixation system using indigenous biosynthesized polymer ”	10.04.2023-16.07.2023
Senior Project Fellow	Prof. Rajendra Singh, Nanoscience and Nanotechnology Centre, Kumaun University, Nainital, Uttarakhand, India Department of Chemistry, D.S.B. Campus, Nainital, Uttarakhand, India	22.09.2021-31.03.2023
Junior Project Fellow	Prof. Rajendra Singh, Nanoscience and Nanotechnology Centre, Kumaun University, Nainital, Uttarakhand, India D.S.B. Campus, Nainital, Uttarakhand, India	16-11-2019-20-09-21

RESEARCH DESCRIPTION

Honors & Awards

1. **Best Lecturer Award**, at final meeting of UNESCO/IUPAC course at Institute of Macromolecular Chemistry, Czech Academy of Science, Prague, Czech Republic, (19th June

2024).

2. **Prof. K.S. Valdiya Research Award for Impact factor of Research Articles (more than 10)**, from SRICC, Kumaun University, Nainital, Uttarakhand (17th August 2023).
3. **“Prof. D. D. Pant, Research award” for Patent in 2022**” from SRICC, Kumaun University Nainital, Uttarakhand (17th August 2023).
4. **Young Scientist Award (ORAL):** 11th Uttarakhand State Science & Technology Congress U-COST (2016- 2017).
5. **Best Poster Award:** International conference on Nanomedicine: Biomolecules for human health (NBHH-2021).

Patent Granted

1. Nanda Gopal Sahoo, Chetna Tewari, Gaurav Tatrari, Sandeep Pandey, **Anita Rana**, Himani Tiwari, Anirban Dandapath; Graphene based nanomaterials derived from *Drepanostachyum falcatum* for water Purification, **Australian patent Grant No.** 2021104582, 2022.

Patent Published

2. Nanda Gopal Sahoo, Mayank Pathak, Bhashkar Singh Bohra, Gaurav Tatrari, **Anita Rana**, Chetna Tewari, Diksha Bhat, Tanuja Arya, “Kinnow peel waste derived graphene nanosheets for high performance supercapacitor”, Patent Application No. 202311051096.
3. Nanda Gopal Sahoo, Chetna Tewari, Gaurav Tatrari, Sandeep Pandey, **Anita Rana**, Himani Tiwari, Anirban Dandapath; Graphene based nanomaterials derived from *Drepanostachyum falcatum* for water Purification, **Indian Patent Application No.:** 202111031289, 2021.

Expertise & research interests

- ❖ Chemical synthesis of graphene oxide (GO)
- ❖ Covalent and non-covalent functionalization of GO
- ❖ Polymer Synthesis (CROP)
- ❖ Polymer-drug conjugates
- ❖ Drug delivery and Drug release studies in nanocarriers
- ❖ Cytotoxic effect in different cancer cells
- ❖ Synthesis of Nanoparticles
- ❖ Antimicrobial and Antioxidant activities

Skills

- ❖ **Material synthesis:** Graphene Oxide, Polymer, Graphene oxide/Polymer (PVA, PEG, PVP) nanocarrier, Nanoparticles, Plant-based nanoparticles
- ❖ **Drug Delivery:**
 - **Synthesis of Graphene oxide-polymer based nanocarrier** for delivery of drugs like curcumin, quercetin etc. along with its cytotoxicity against various cancer cell lines.
 - **Synthesis of Graphene oxide-polymer based nanocarrier** and incorporation of natural products as a drug on graphene oxide based nanocarrier to enhance their cytotoxicity against Breast Cancer Cells.
- ❖ **Natural Product:** Extraction of volatiles and non- volatiles compounds from plants, their characterization, and examination of their bioactivities against microbiological screen test models, Incorporation of natural products on Carbon nanomaterial
- ❖ **Structural Characterization:** Raman Spectroscopy, FT-IR spectroscopy, UV-Visible spectroscopy, XRD, HR-TEM, FE-SEM, XPS, EDX, TGA, GC, GC-MS, GPC, NMR
- ❖ **Instrumentation Handling:** Mini Spray dryer, Spectroscopic and Imaging instrument, Fourier Transform Infra-Red Spectrometer (FT-IR), Tube Furnace, UV-Visible spectrometer, Thermogravimetric Analysis (TGA), Dynamic light scattering (DLS), Glove Box
- ❖ **Languages:** English, Hindi (Native)

Journal Publications

Research Articles:

1. **Anita Rana**, Monika Matiyani, Pushpa Bhakuni Negi, Himani Tiwari, Kamal Garwal, Nanda Gopal Sahoo, PVP functionalized graphene oxide as a nanocarrier for dual drug delivery of quercetin and curcumin against HeLa cancer cells: The synergistic effect, Journal of Vinyl and Additive Technology, **2024**, (IF. 2.7)
2. **Anita Rana**, Sandeep Pandey, Monika Matiyani, Himani Tiwari, Puaahpa Bhakuni Negi, Nanda Gopal Sahoo, Pink Photoluminescent Nitrogen-Doped Graphene Oxide Nano Sheets from Juniperus squamata Roots and their toxicity against Malaria Mosquitoe (*Plasmodium falciparum*) and Human Cervical Cancer Cells (HeLa): A Green Approach, Materials Chemistry and Physics, **2023**, I.F. 4.6
3. **Anita Rana**, Monika Matiyani, Chetna Tewari, Pushpa Bhakuni Negi, Mahesh Chandra Arya, Vishal Das, Mintu Pal, Nanda Gopal Sahoo, Functionalized Graphene Oxide Based Nanocarrier for

Enhanced Cytotoxicity of *Juniperus squamata* Essential Oil against Breast Cancer Cells, Journal of drug delivery science and technology. **2022**, 72: 103370. **I.F. 5.00**

4. Bhaskar Singh Bohra, Poonam Singh, **Anita Rana**, Harsh Sharma, Tanuja Arya, Sravendra Rana, Nanda Gopal Sahoo, Functionalized graphene oxide -based epoxy nanocomposite for structural and self-healing applications. Composites Science and Technology. **2023**. **I.F. 9.1**

5. Monika Matiyani, **Anita Rana**, Neha Karki, Kamal Garwal, Mintu Pal, Development of multi-functionalized graphene oxide based nanocarrier for the delivery of poorly water soluble anticancer drugs, Journal of drug delivery science and technology, **2023**. **I.F. 5.00**

6. **Anita Rana**, Pushpa Negi Bhakuni, Ankita H.C. Tripathi, Mintu Pal, Nanda Gopal Sahoo, Chemical composition, antifungal, antioxidant and cytotoxic potential of *Apium graveolens* essential oil collected from Nainital, Uttarakhand, Journal of Essential Oil Bearing Plants. **2022**. **I.F. 1.69**

7. **Anita Rana**, Pushpa Bhakuni Negi, Nanda Gopal Sahoo, Phytochemical screening and characterization of bioactive compounds from *Juniperus squamata* root extract, Materials Today: Proceedings, 2021, 48: 672-675. **I.F. 1.46**

8. Monika Matiyani, **Anita Rana**, Mintu Pal, Sumit Dokwal, Nanda Gopal Sahoo, Polyamidoamine Dendrimer decorated Graphene Oxide as a pH-sensitive nanocarrier for the delivery of hydrophobic anticancer drug Quercetin: A Remedy for Breast Cancer, Journal of pharmacy and pharmacology. **2023**. **I.F. 4.81**

9. Monika Matiyani, **Anita Rana**, Mintu Pal, Nanda Gopal Sahoo, Polymer Grafted Magnetic Graphene Oxide as a Potential Nanocarrier for pH-Responsive Delivery of Sparingly Soluble Quercetin Against Breast Cancer Cells, RSC Advances, 2021. **I.F. 4.06**

10. Himani Tiwari, Neha Karki, Chetna Tewari, Neema Pandey, **Anita Rana**, Sravendra Rana, Mintu Pal, Nanda Gopal Sahoo. Dual Drug Loaded Potassium-Contained Graphene Oxide as a Nanocarrier in Cocktailed Drug Delivery for the Treatment of Human Breast Cancer. Current Drug Delivery **2022**. **I.F. 3.75**

11. Chetna Tewari, Gaurav Tatrari, Sumit Kumar, Sandeep Pandey, **Anita Rana**, Mintu Pal, Green and cost-effective synthesis of 2D and 3D Graphene-based nanomaterials from *Drepanostachyum falcatum* for Bio-imaging and Water purification applications, Chemical Engineering Journal Advances, 10 (2022) 100265.

12. Vinay Deep Punetha, Sunil Dhali, **Anita Rana**, Neha Karki, Himani Tiwari, Pushapa Bhakuni Negi, Souvik Basak, Nanda Gopal Sahoo, Recent Advancements in Green Synthesis of Nanoparticles for improvement of bioactivities: A Review, Current Pharmaceutical Biotechnology. Accepted (Ref. No. BMS-CPB-2020-482), 2022. **I.F. 2.82**

13. Neha Karki, Himani Tiwari, Chetna Tewari, **Anita Rana**, Neema Pandey, Souvik Basak, Nanda Gopal Sahoo, Functionalized graphene oxide as a vehicle for targeted drug delivery and bioimaging applications, *Journal of Material Chemistry B* 8(36), 8116-8148, 2020. **I.F. 7.5**
14. Pushpa Negi Bhakuni, **Anita Rana**, Nanda Gopal Sahoo, Facile synthesis and characterization of ZnO nanoparticles for studying their sensitivity towards water borne pathogens. **Asia -Pacific Journal of Science and Technology, 2023.**
15. Shiva Biswas, Pushpa Bhakuni Negi, Abhishek Pathak, **Anita Rana**, Sandeep Kumar Sunori. Synthesis and Characterization of Graphene/cellulose Xanthate Nanocomposite for dye removal from waste water. *Materials Today: Proceedings.* **2023, I.F. 1.46.**
16. Manoj Kumar Devrani, Kundan Prasad, Deepak Chandra, **Anita Rana**, Kavita Rawat, G. Bisht “Study On the chemical composition of the essential oil of *Taraxacum mitalli* collected from Kumaun, Himalayas, Uttarakhand”, **World Journal of Pharmaceutical Research**, Vol-6, 2277-7105, 2017.
17. Kavita Rawat, Kundan Prasad, Deepak Chandra, Ganga Bisht, I.D. Bhatt, **Anita Rana** and Manoj Kumar Devrani, Phytochemical Analysis and Antioxident Activity of *Leptodermis lanceolata* Essential Oil from Pithoragrah, **Journal of Pharmacology & Clinical Research**, Uttarakhand, India, Vol-4, 2473-5574, 2017.

Paper Communicated

18. Bhashkar Singh Bohra, Manoj Karakoti, **Anita Rana**, Mayank Pathak, Monika Matiyani, Tanuja Arya, Adam Strachota, Sravendra Rana, Suryawanshi Bose, and Nanda Gopal Sahoo, 2024, “A critical comparative study between graphene oxide and functionalized graphene oxide-based polymer nanocomposites for various applications”, *Progress in Polymer Science.* **(I.F. 27.1) (Proposal Accepted, Manuscript Number: PPS-D-24-00204)**
19. Pushpa Bhakuni Negi, Mayank Pathak, Kundan Singh Rawat, **Anita Rana**, Tanuja Arya, Chetna Tewari, Shiva Biswas, Yong Chae Jung 2024, “Green synthesis of naturally SiO₂ doped carbon nanomaterial from agriwaste (rice husk) for supercapacitor application”, *Biomass and Bioenergy.* **(I.F. 5.8) (Manuscript Number: JBAB-D-24-01069)**

Book Chapters

1. **Anita Rana**, Monika Matiyani, Bhashkar Singh Bohra, Pushpa Bhakuni Negi and Nanda Gopal Sahoo, *General Properties of Two-Dimensional Nanosheets*, Nova Science Publishers, Inc. (NOVA), USA, 1-24, **2024**, ISBN-979-889113455-3, 979-889113381-5.

2. C. Tewari, S. Pandey, S. Sharma, M. Matiyani, **Anita Rana**, V. Pande, N. G. Sahoo, Classification and Management of Waste: Upcycling of Waste into Nanomaterials for Water Remediation, Waste and Waste Management, Ed. N.G. Sahoo, Nova Science Publishers, Inc. (NOVA), USA, 25-46, 2021, ISBN-978-168507394-7, 978-168507369-5.
3. **Anita Rana**, Neha Karki, Himani Tiwari, Pushpa Bhakuni Negi and Nanda Gopal Sahoo, Role of natural products in herbal medication for novel drug delivery applications, Nova Science Publishers, Inc. (NOVA), USA, 2020, ISBN-978-1-53618-140-1.
4. Neha Karki, **Anita Rana**, Himani Tiwari, Pushpa Bhakuni Negi and Nanda Gopal Sahoo, Theranostics application of graphene-based materials in cancer imaging, targeting and treatment, Intech Open Publisher, 2020, DOI: <http://dx.doi.org/10.5772/intechopen.91331>

Conference Presentations

1. **Anita Rana**, Volodymyr Lobaz, Johana K. Elter, Martin Hruby, “Biodegradable solid lipid particle carriers for polymer-ligand conjugates”, Polymer for Sustainable Future, at Institute of Macromolecular Chemistry, Czech Academy of Science, Prague, Czech Republic, **24-28 June 2024**.
2. **Anita Rana** and Nanda Gopal Sahoo, “Pink photoluminescent nitrogen-doped graphene oxide nanosheets from *Juniperus squamata* roots and their cytotoxic potential against human cervical cancer cells (HeLa cells): A green approach”, Research Summit on Advanced in Nanotechnology, Saveetha Engineering College (02nd February 2022).
3. Bhashkar Singh Bohra, Tanuja Arya, **Anita Rana**, and Nanda Gopal Sahoo, “Waste to wealth: Agricultural waste derived graphene oxide based poly(vinyl alcohol) nanocomposites for advanced applications”, Research Summit on Advanced in Nanotechnology, Saveetha Engineering College (02nd February 2022).
4. **Anita Rana**, Monika Matiyani, Nanda Gopal Sahoo, Functionalized graphene oxide as a nanocarrier for exploration of cytotoxicity of *Juniperus squamata* essential oil against Breast Cancer Cells, on International conference on Nanomedicine: Biomolecules for human health, Kirori Mal College, University of Delhi, September 27-28, 2021.

5. **Anita Rana**, K-Means Clustering of Air Quality Data of Uttarakhand, India during Lockdown Period of Covid-19 Pandemic, on International Conference on Inventive Computation Technologies (ICICT 2021) at RVS Technical Campus Coimbatore, India, 20-22 January 2021.
6. Monika Matiyani, **Anita Rana**, Nanda Gopal Sahoo, Dandrimar functionalized graphene oxide based nanocarrier for pH responsive delivery of anticancer drug quercetin: A remedy for breast cancer on International Conference on Nanomedicine: Biomolecules for human health, Kirori Mal College, University of Delhi, September 27-28, 2021.
7. **Anita Rana**, Vinay Deep Punetha, Ganga Bisht, “In vitro Antifungal activity of essential oil of *Apium graveolens* against some phytopathogenic fungi”, 1st International Conference on Integrative Chemistry, Biology and Translational Medicine, Centre for Health, Hansraj College, University of Delhi, Delhi, February 25-26, 2019.
8. **Anita Rana**, Vinay Deep Punetha, Ganga Bisht, “In Vitro inhibition activity of essential oil of *Juniperus squamata* root against some pathogenic Fungi”, 2nd International conference on Energy, Functional Materials and Nanotechnology & Sustainable Environment Management, Nanoscience & Nanotechnology Centre, Department of Chemistry, Kumaun University, Nainital, May 24-26, 2019.
9. **Anita Rana**, Vinay Deep Punetha, Ganga Bisht, “In Vitro inhibition activity of essential oil of *Juniperus squamata* root against some pathogenic Fungi”, 2nd International conference on Energy, Functional Materials and Nanotechnology & Sustainable Environment Management, Nanoscience & Nanotechnology Centre, Department of Chemistry, Kumaun University, Nainital, May 24-26, 2019.
10. **Anita Rana**, Kundan Prasad, Deepak Chandra, Kavita Rawat, Vinay Deep Puneetha, G. Bisht. “Amino acid and antioxidant composition of some wild edible medicinal plants of Uttarakhand Himalayas”, 11th Uttarakhand State Science & Technology Congress U-COST, Dehradun. 2016- 2017.
11. **Anita Rana**, Mahesh Arya, G. Bisht, “Density relationship for adsorption capacity of *Liriodendron tulipifera* (hard wood) and *Cedrus deodara* (soft wood)”, National Seminar on Plants and Environment (NSSAPPE), Nainital, 2016- 2017.
12. **Anita Rana**, Kundan Prasad, Deepak Chandra, Kavita Rawat, Vinay Deep Punetha, G.Bisht, “Chemical Composition of the essential oil of *Euphorbia thymifolia* Linn”, 8th Conference of The Indian Science Congress Association, Nainital, October, 14-15, 2017.

Seminar/workshops

- 1. Seminar on National Science Day**, Kumaun University, Nainital, February 28, 2017.
- 2. Interaction Program for Ph.D. Scholars**, University Grants Commission USC-Human Resource Development Centre Kumaun University, Nainital, July 13-15, 2017.
- 3. Two-day Workshop** on Non-Traditional Optimization Technique, Uttarakhand Science Education & Research Centre (USERC) in association with Kumaun University, Nainital, October, 15-16, 2018.
- 4. National Workshop**, Participant, University Grants Commission USC-Human Resource Development Centre Kumaun University, Nainital, March, 2019.
- 5. National level workshop on** conservation of traditional knowledge system of Uttarakhand & IPR, Uttarakhand State Council for Science and Technology (UCOST) Dehradun, Uttarakhand. March, 3, 2021.

Organizing committee

1. Member of Organizing committee, 2st International conference on Energy, Functional Materials and Nanotechnology & Sustainable Environment Management, Nanoscience & Nanotechnology Centre, Department of Chemistry, Kumaun University, Nainital, May 24-26, 2018

PERSONAL SKILLS

➤ Knowledge of research methodologies, computer skills, data and information collection, writing and presenting reports, keen interest in exploring ideas, designing and planning for pilot scale work, time punctual, dedicated to achieve the goal, confidence & personal integrity are my most important aspects, openness to change and willingness to learn, communication (Hindi and English), confidence, leadership, organization, team work, working under pressure, problem solving, perseverance and motivation, commercial awareness and social awareness.

❖ Personal Information

- Citizenship: India
- Status: Married, Female
- Date of Birth: 11-11-1991

❖ **References.**

<p>Prof. Nanda Gopal Sahoo, FRSC Professor and In-charge Prof. Rajendra Singh Nanoscience and Nanotechnology Centre Department of Chemistry DSB Campus, Kumaun University Nainital, Uttarakhand, India Mob: +91-9456730659 Email: ngsahoo@yahoo.co.in Website: www.ngsahooresearchgroup.in</p>	<p>Dr. Volodymyr Lobaz Senior Researcher, Department Supramolecular Polymer Systems, Macromolecular Chemistry, Czech Academy of Science, Prague, Czech Republic Mob: + 420-774693216 Email: lobaz@imc.cas.cz</p>
<p>Dr. Johanna Elter Senior Researcher, Friedrich Schiller University Jena Lessingstr Germany Mob: +49-1632030426 Email: johanna.elter@gmx.de; johanna.elter@uni-jena.de</p>	<p>Dr. Souvik Basak Associate Professor, Dr. B.C. Roy College of Pharmacy Allied Health Sciences, Durgapur, WB, India Mob: +91-9051226973 Email: souvik_basak1@yahoo.com</p>

DECLARATION: I do hereby declare that the particulars of information and facts stated here in above are true, correct and complete to the best of my knowledge and belief.



Dr. Anita Rana

Date: 13.09.2024

