

Dr. Suman Jha (Ph.D., Biophysical Chemistry)



Professional Details

Present Position	Associate Professor Department of Life Science, National Institute of Technology Rourkela, 769008, Odisha, India. jhas@nitrkl.ac.in , sumjha2004@gmail.com +917381108201 (mob.), +916612462687 (Off.) https://website.nitrkl.ac.in/jhas
Linkedin profile	Suman-Jha-3b0bbb11
Date of Joining	5 th Sept. 2011
Teaching Area	Biophysical Chemistry and BioAnalytical Techniques.
Research Area	Protein Nanoscale Biophysics, NanoBiotechnology.

Academic Qualifications

- Research Fellow, Department of Molecular and Cell Biology, University of Connecticut, USA, 2010-2011. **Guide:** Prof. Dr. Andrei T. Alexandrescu, **Topic:** IAPP and SEVI peptides fibrillization in different chemical conditions.
- Ph.D., Department of Physical Chemistry-I, Technical University of Dortmund, Germany, 2006-2009. **Guide:** Prof. Dr. Roland Winter, **Topic:** Amyloidogenic propensity of recombinant human proIAPP.
- M.Sc. (Biotechnology), School for Biotechnology, Jawaharlal Nehru University, New Delhi, India, 2003-2005. M.Sc. Research project **Guide:** Prof. Dr. Rajiv Bhat, **Topic:** Lysozyme fibrillization in different chemical and physical conditions.
- B.Sc. (Analytical Methods in Chemistry and Biochemistry), Delhi University, Delhi, India, 2002.

Awards & Honors

- INSPIRE Faculty Award by Department of Science and Technology (DST), Govt. of India, 2013-2018.
- Post-Doctoral Fellowship by American Diabetes Association (ADA), USA, 2010-2011.
- International Max-Planck Research School for Chemical Biology (IMPRS-CB) scholarship for Ph.D. research, Germany, 2006-2009.
- CSIR-LS-JRF, India, 2005.
- Postgraduate scholarship, Department of Biotechnology (DBT), India, 2003-2005.

Research Interest

- **Protein folding/dynamics:** When a protein gets off folding pathway, sometime attains a very stable, rigid and possibly cytotoxic conformation(s). Examples of such disease are Parkinson's, Alzheimer's, Diabetes Type II, Cystic Amyloidosis etc. Here, our focus is to understand the molecular mechanism of amyloidosis, and characterize the intermediate form with most cytotoxic propensity. In addition to amyloidosis, our aim is also to understand the role of possible cellular moieties (from different sources like plant, bacteria, algae), which may act against or in favor of the amyloidoses. Another leaf of the tree belongs to study different protein's dynamics in presence and absence of heavy metal ions and plant extract. Most of the proteins belong to different diseases, like cancer, type II diabetes, alzheimers diseases etc.
- **Nanoscale biophysics:** Another part of our research focus is to study nanoparticle behavior to biological system from biophysicist point of view. Nanoparticle behaviors totally depend upon the physico-chemical properties of the interface, space appear between nanoparticle surface and biological entity which is interacting with the surface. Certain properties of the interface furnish nanoparticle cytotoxic nature, while subtle changes in the properties give it biocompatible nature. Our group is interested in exploring the properties in order to get certain interface with possible applications to different scientific arena.



Thus, my research interest is to explore the biophysical aspects of nanoparticle-protein and nanoparticle-biological interfaces interactions to optimize better nanoformulations for biological applications.

Research Grants (Total: 7; 5 as PI, and 2 as Co-PI)

- DBT, Govt. of India, titled “Conformational, amyloidogenic and cytotoxic propensities of recombinant human proIAPP”, 2013-2017 ([Completed, PI](#)).
- INSPIRE faculty research grant (INSPIRE-AORC) for proposal titled “Nanoparticle: A boon or bane for human IAPP/proIAPP monomer” from Department of Science and Technology, Govt. of India, 2013-2018 ([Completed, PI](#)).
- D.B.T. Twinning Programme, Govt. of India, titled “Nanoparticle based approach to enhance the AMP efficacy against AMP resistant bacteria”, 2016-2019 ([Completed, PI](#); Collaborator: [Dr. A. N. Jha, Tezpur University](#)).
- I.C.M.R., Govt. of India, titled “Optimizing ZnONP-insulin interaction interface in order to optimize insulin formulation”, March 2021- March 2024 ([Ongoing, PI](#)).
- D.S.T.-Odisha, Govt. of India, titled “Investigation of α -synuclein fibrillation in presence of varying ZnONP interface”, Nov. 2019-Nov. 2022 ([Ongoing, PI](#)).

Patent

- **Indian Patent:** [Suman Jha](#), Manoranjan Arakha, Parth Sarthi Nayak, “Method for continuous production of silver nanoparticle using *Bacillus thuringiensis*” (CBR No. 2977), Ref. N. 201631007436. [TEMP/E-1/6629/2016-KOL](#). ([Published, May 2017](#))

Publications (total no.: 41, h index: 18, total citation: 1813 – Scopus data)

Scopus Author ID: [24503197200](#); Google Scholar ID: [Suman Jha](#)

(Important recent publications from N.I.T. Rourkela, India, only)

1. Asthana, S., Bhattacharyya, D., Kumari, S., Nayak, P.S., Saleem, M., Bhunia, A. & [Jha, S.*](#) (2020) Interaction with zinc oxide nanoparticle kinetically traps α -synuclein fibrillation into off-pathway non-toxic intermediates. *International Journal of Biological Macromolecules*, 150, 68-79. (IF: 6.95, Citations 14, [ijbiomac.2020.01.269](#))
2. Nayak, P.S., Borah, S. M., Gogoi, H., Asthana, S., Bhatnagar, R., Jha, A. N. & [Jha, S.*](#) (2019) Lactoferrin adsorption onto silver nanoparticle interface: implications of corona on protein conformation, nanoparticle cytotoxicity and the formulation adjuvanticity. *J. Chemical Engineering*, 361, p470-484. (IF: 13.27, Citations 44, [cej.2018.12.084](#))
3. Arakha, M., Borah, S.M., Saleem, M., Jha, A.N. & [Jha, S.*](#) (2016) Interfacial assembly at silver nanoparticle enhances the antibacterial efficacy of nisin. *Free Radical Biology and Medicine*, 101, 434-445. (Citations 33, [freeradbiomed.2016.11.016](#)).
4. Arakha, M., Pal, S., Samantrai, D., Panigrahi, T.K., Mallick, B.C., Pramanik, K., Mallick, B. & [Jha, S.*](#) (2015) Antimicrobial activity of iron oxide nanoparticle upon modulation of nanoparticle-bacteria interface. *Scientific Reports* 5, 14813. (Citations 510, [srep14813](#)).
5. Arakha, M., Saleem, M., Mallick, B.C., & [Jha, S.*](#) (2015) The effects of interfacial potential on antimicrobial propensity of ZnO nanoparticle. *Scientific Reports*, 5, 09578. (Citations 322, [srep09578](#)).

Book (02) / Book Chapter (05)

- Arakha, M, Pradhan, A.K. & [Jha, S.](#) (2021) Bio-Nano Interface: Application in food, healthcare and sustainability. Springer Singapore. (eISBN: [978-981-16-2516-9](#), Book)
- Arakha, M. and [Jha, S.](#) Interfacial phenomena on biological membranes. Springer-Verlag, GmbH Germany, 2018. (eISBN: [978-3-319-73326-5](#), Book)

