

Dr. Neethu Hari



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PROFESSIONAL

Designation and Affiliation

Lecturer (on contract basis)

Department of Biotechnology,
University of Kerala,
Kariavattom Campus.

Research Interests

- Development of nanomaterials for nanomedicine based applications
- Polymer Nanomaterials for Food Packaging and Drug delivery
- Animal cell culture
- Nano-based Tissue Engineering
- Molecular microbial analysis
- Molecular biology
- QD nanomaterials for Bioimaging purpose

Education:

Ph.D. in Biotechnology (December 2019)

M.Phil. Nanobiology (May 2012) - A grade

M.Sc. Biotechnology (May 2010) -1st class (67.5%)

B.Sc. Botany and Biotechnology (April 2008) -1st class with distinction (84.2%)

Awards/ Honors/ Fellowships:

Best Paper Award (Raman Optronics Webinar Series 2020)	Dec.2020
Best Oral presentation Award (National Seminar on Frontiers in Biotechnology, University of Kerala)	Mar.2017
Best Oral Presentation Award (11 th Asia Pacific Chitin and Chitosan Symposium & 5 th Indian Chitin and Chitosan Society Symposium)	Sep.2016
Best Paper Award (MARC Life Sciences 2015)	Dec.2015
Junior Research fellowship (Kerala University)	Jan.2014 -June. 2017
Qualified certified peer reviewer course (Researcher academy, Elsevier)	Sep. 2019
Qualified Certified online course on Nanotechnology, Law and Policy (Udemy)	2020
Qualified as certified Publons Academy Peer Reviewer	2020

Membership

- Nano and Molecular Society (2020)

Invited Talks and Class:

- Invited Talk on 'Recent Trends in Nanobiotechnology' at Department of Botony, St. Johns College, Anchal, Feb. 2020.
- Invited for a class on Nanomedicine at Department of Biotechnology, Mar Ivanios College, Thiruvananthapuram – March 2020

Teaching experience:

M.Phil Nanoscience and Nanotechnology

- Lecturer (on contract basis) at the Department of Nanoscience and Nanotechnology, University of Kerala (2013-2014).

P.G. Biotechnology

- Took Nanobiotechnology class for P.G. Biotechnology students in Department of Biotechnology, University of Kerala during my Ph.D. research work (2015-2019)
- Lecturer (on contract basis) at the Department of Biotechnology, University of Kerala (2021- Present)

Reviewer of Journals:

Peer Reviewer (International journal of Nanomedicine-Dove Medical Press)	2019 & 2020
Peer Reviewer (Drug design, Development and Therapy-Dove Medical Press)	2019
Peer Reviewer (Current science- Indian Academy of Science)	2019
Peer Reviewer (Macromolecular Symposia – Wiley Online Library)	2019 & 2020

Research experience:

Ph.D. Research work

My Ph.D. work was aimed at development, structural and functional characterization of biodegradable polymer films and polymer nanoparticles. We also focused on the modification of packaging film by the incorporation of different types of essential oils (clove oil, peppermint oil and orange oil) & starch nanocrystals and its applications in the food industry. The research work contributed in successfully developing a novel method to increase the shelf life of packaged foods through modified active packing films which can find potential applications in the food industry.

M.Phil. Research work

The work mainly includes the development, characterization, and biological evaluation of silver nanoparticles by green synthesis method. Here silver nanoparticle is synthesized by reduction method using *Allium cepa* and *Allium sativum* and evaluated the synergistic antimicrobial activity of green synthesized silver nanoparticle with β -Cephem and Penem antibiotics.

M.Sc. Project work

Here the work involves the identification of differential genes responsible for the development of retinal ganglionic cells. This clone is from the cDNA library which is specifically developed by the suppression subtractive hybridization of E13 retina and E13 brain, it should have specific role in retinal development at E13 stage. While using strategies like regenerative medicine, the importance of such differentially expressed genes can be utilized for better development of RGCs from embryonic stem cells.

No. of M. Phil. Projects Undertaken- 6

No. of M.Sc. Projects Undertaken- 16

M.Phil. and M.Sc. Projects Under taken (Selected ones)

1. Fabrication and characterization of chitosan-based nanofilms for tissue engineering applications (M.Phil. Project, 2014).
2. Biogenic synthesis and characterization of copper nanoparticles using *Aloe vera* and its biological evaluation (M.Phil. Project, 2015)
3. Synthesis and Characterization of Novel Chitosan based Films Incorporated with Starch Nanocrystals and Orange oil (M.Sc. Project, 2016)

4. Microbial synthesis (extracellular and intracellular) of CdTe quantum dots for biolabeling application (M.Sc. Project, 2018)
5. Synthesis, characterization and biological application of chitosan nanoparticle incorporated with β -carotene (M.Sc. Project, 2018)
6. Synthesis and characterization of albumin nanoparticles loaded with the extract of *Hemigraphis colorata* for wound healing applications (M.Phil. Project, 2019).
7. Green synthesis and characterization of zero valent iron nanoparticles by the leaf extract of *Myristica fragrans* for water remediation (M.phil Project, 2019)
8. Development of PLA based scaffolds incorporated with nano formulation of β -Carotene for tissue engineering application (M.Sc. Project, ongoing).

Practical experience:

Animal cell culture, tissue engineering, synthesis of nanomaterials, general microbiology especially anoxic/anaerobic studies and molecular biology, PCR technique, Cloning, XRD, FTIR, TGA, essential bioinformatics tools *etc.*

Instrumental knowledge:

Hands on experience in operating instruments like lyophilizer, microplate reader, rota vapor, vacuum concentrator, PCR machine, gel electrophoresis, gel documentation system, centrifuges, deep freezers, chemiluminescence, spectrophotometers *etc.*

Research Publications:

1. No. of research publications In Peer reviewed Journals: 12
2. No. of Book chapters published: 4

Publications:

1. **Neethu H**, Supriya R & Ananthakrishnan J N., Cancer Diagnostics and Therapeutics : Recent advances in Nanomedicine, ***Research Journal of Biotechnology***, 16, (2021), 221- 230 (Impact factor-0.21)
2. Manu J M, **Neethu H**, Raveendran K P, Ananthakrishnan J N, Sreelekha T T., Galactoxyloglucan Endowed Biogenic Nano-immunobiotics Arrests Microbial Growth and Elicits Antitumor Immunity, ***ACS Applied Biomaterials***. (2020), 3(2), 801-814.
3. **Neethu H**, Stegiya F, Alakananda G R N & Ananthakrishnan J N., Synthesis, characterization and biological evaluation of chitosan film incorporated with β -Carotene loaded starch nanocrystals, ***Food packaging and shelf life***, 16, (2018), 69-76. (Impact Factor- 4.244)

4. Smrithi S, Supriya R, **Neethu H**, Ananthakrishnan J N., Nanocomputing in medicine, *Literary Findings*, 1V-1 (Special edition), (2018), 119-121.
5. **Neethu H**, Karthika S, Supriya R & Ananthakrishnan J N., Physico-chemical and biological properties of starch nanocrystals and orange oil incorporated chitosan film. *Journal of Polymer Materials*, 34, (2017), 261-274. (Impact factor- 0.32)
6. Manu J M, Nair J B, Adukkadan R N, **Neethu H**, Pillai R K, Ananthakrishnan J N, Maiti K K & Therakathinal S T., Exploration of biogenic Nano-chemobiotics fabricated by silver nanoparticle and galactoxyloglucan with an efficient biodistribution in solid tumor investigated by SERS fingerprinting, *ACS Applied Materials and Interfaces*, 9, (2017), 19578–19590 (Impact factor- 8.75)
7. Anupama V N, Ananthakrishnan J N, Mary P, **Neethu H** & Nidhin B., Evaluation of currently employed food preservation conditions to tackle biofilm forming food pathogens, *Journal of Food Safety*, 38, (2017), e12407.(Impact factor-1.13)
8. **Neethu H** & Ananthakrishnan J N., Development and characterization of chitosan-based antimicrobial films incorporated with streptomycin loaded starch nanoparticles. *New Horizons in Translational Medicine*, 3, (2016), 22–29.
9. **Neethu H**, Tincy K T & Ananthakrishnan J N., Comparative study on antibiofilm activity of capped silver nanoparticles. *Journal of Aquatic Biology and Fisheries*, 2, (2014), 390 -392.
10. **Neethu H**, Tincy K T & Ananthakrishnan J N., Comparative study on the synergistic action of differentially synthesized silver nanoparticles with β -Cephem antibiotics and chloramphenicol. *Journal of Nanoscience*, Vol. 2014, (2014), 8 pages.
11. **Neethu H**, Tincy K T & Ananthakrishnan J N., Comparative study on the synergistic action of garlic synthesized and citrate capped silver nanoparticles with β -Penem antibiotics. *ISRN Nanotechnology*, Vol.2013, (2013), 6 pages.
12. **Neethu H & Ananthakrishnan J N.**, Effect of chitosan-based coating enriched with starch nanocrystals and orange oil on the nutritional properties of tomatoes. *Research Journal of Biotechnology*, (2020), Just accepted. (Impact Factor -0.21)

Book chapters:

1. **Neethu H**, & Ananthakrishnan J N., (2015), Preparation and characterization of streptomycin loaded starch nanocrystals for controlled release of streptomycin and its antibacterial activity, *Revamping Microbial Biotech.*, Publications division, Manonmaniam Sundaranar University, Tirunelveli, Tamilnadu, ISBN: 978-93-81402-35-1.

2. **Neethu H**, Supriya R, Athira S D & Ananthakrishnan J N., (2019), New Insights into the Pharmaceutical and Food Based Applications of Starch Nanocrystals, ***Nanotechnology in Biology and Medicine: Research Advancements & Future Perspectives***, CRC Press, **Taylor & Francis**.
3. **Neethu H**, Supriya R & Ananthakrishnan J N, (2020), Nanosensors as Potential Multisensor Systems to Ensure Safe and Quality Food, ***Biotechnological Approaches in Food Adulterants***, CRC Press, Taylor & Francis.
4. Supriya R, **Neethu H** & Ananthakrishnan J N, (2020), Innovative and Emerging Technologies in the Detection of Food Adulterants, ***Biotechnological Approaches in Food Adulterants***, CRC Press, Taylor & Francis.

Conference papers (selected ones):

1. **Neethu H** & Ananthakrishnan J N, Development of active food packaging film containing starch nanocrystals and peppermint oil for shelf life extension of red meat, Natopnal conference on the Life Science Ecosystem, AIAM- 2021.
2. **Neethu H**, & Ananthakrishnan J N, Starch nanocrystals in developing antimicrobial for food packaging application, Raman Optronics Webinar Series, 2020, **(Best Paper Award)**.
3. **Neethu H**, & Ananthakrishnan J N, Physico chemical and biological property of chitosan- based film incorporated with starch nanocrystals and orange oil, National seminar on frontiers in biotechnology, 2017 **(Best Oral Presentation Award)**.
4. **Neethu H**, Heleena M & Ananthakrishnan J N, Physical and biological evaluation of novel chitosan-based film incorporated with starch nanocrystals and pepper mint oil, 11th Asia pacific chitin and chitosan symposium & 5th Indian chitin and chitosan society symposium, 2016 **(Best Oral Presentation Award)**.
5. **Neethu H** & Ananthakrishnan J N, Development and characterization of chitosan-based antimicrobial films incorporated with streptomycin loaded starch nanoparticles 5th Annual international convention of association of pharmacy professionals, 2016.
6. **Neethu H**, Stegiya F & Ananthakrishnan J N, Synthesis and characterization of chitosan-based films incorporated with β -Carotene loaded starch nanocrystals, MARC life sciences, 2015, **(Best Paper Award)**.
7. **Neethu H** & Ananthakrishnan J N, Preparation and characterization of streptomycin loaded starch nanocrystals for controlled release of streptomycin and its antibacterial activity, RMBT, 2015.

8. **Neethu H** & Ananthakrishnan J N, Preparation and characterization of starch nanocrystals for controlled release of β -Carotene, National seminar on Nanoscience and Nanotechnology, 2015.
9. **Neethu H**, Tincy K Thomas and Ananthakrishnan J N, Synthesis and Characterization of citrate capped silver nanoparticles and their antibacterial activity, Advances in tissue engineering and regenerative medical technology, 2014.
10. **Neethu H**, Tincy K Thomas and Ananthakrishnan J N, Comparative study on antibiofilm activity of capped silver nanoparticles, Ecosystem conservation, Climate change and Sustainable Development, 2013.
11. **Neethu H**, Tincy K Thomas and Ananthakrishnan J N, Green synthesis of silver nanoparticles using Allium sativum and its antibacterial activity, 25th Kerala Science Congress, 2013.
12. **Neethu H**, Tincy K Thomas and Ananthakrishnan J N, Comparative study on the synergistic action of green and chemically synthesized silver nanoparticles with B- Lactam Penem Antibiotics, Recent Advances and Challenges in Biotechnology, 2012.

References:

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