Biodata

Name : Dr Meenal Kowshik

Present Position Associate Professor
Birla Institute of Technology & Science-Pilani,
K K Birla Goa Campus.

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BITS Pilani K K Birla Goa Campus,
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Date of Birth : 23.10.1974

Educational Qualifications:

S.No.	Degree	University	Year	Subjects	Class
1	BSc	Goa University	1995	Microbiology Chemistry	First
2	MSc	Goa University	1997	Microbiology	First
3	Ph.D	Pune University	2003	Microbiology	-

Title of PhD thesis: Microbial synthesis of semiconductor and transition metal nanoparticles, their physico-chemical characterization and evaluation as nanomaterials.

Details of employment:

Associate Professor in the Department of Biological Sciences at BITS Pilani, K K Birla Goa Campus, March 2013-

Assistant Professor in the Department of Biological Sciences at BITS Pilani, K K Birla Goa Campus, Jan 2006- Feb 2013

Lecturer in the Department of Biological Sciences at BITS Pilani, K K Birla Goa Campus, June 2004-Dec 2005

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Sanctioned Research Projects:

Biological Synthesis of Metal Sulfide and Metallic Nanoparticles Using Halophilic Archaebacteria, Ministry of Earth Sciences, 2011-2014. (Principal Investigator).

Effect of nanoparticles on small GTPases and Protein synthesis, BRNS, 2011-2014. (Co-Investigator)

Chemical modification of some metal ion binding peptides with photoactive molecules, and investigations on their photo-induced DNA damage and photo-enhanced antimicrobial activity, DBT, 2010-2013. (Co-Investigator).

Studies of Haloarchaea producing polyhydroxyalkanoates, UGC, 2009-2012. (Co-Investigator).

Studies on marine micro-organisms for synthesis of nanoparticles, DST, 2006-2009. (Principal Investigator)

Preparation and characterization of nanosized TiO_2 and studies on its photodegradation capability of model organic pollutants, DST, Nanoscience and Technology Initiative program, 2007-2010. (Principal Investigator).

List of publications

Kshipra Naik, Amrita Chatterjee, Halan Prakash and **Meenal Kowshik**, Mesoporous TiO_2 nanoparticles containing Ag ion with excellent antimicrobial activity at remarkable low silver concentrations, *Journal of Biomedical Nanotechnology*, doi:10.1166/jbn.2012.1567, 2013.

Pallavee Srivastava & **Meenal Kowshik**, Mechanisms of Metal Resistance and Homeostasis in Haloarchaea, *Archaea.* doi.org/10.1155/2013/732864, 2013.

Pallavee Srivastava, Judith Braganca, Sutapa Roy Ramanan, **Meenal Kowshik,** Synthesis of silver nanoparticles using haloarchaeal isolate *Halococcus salifodinae* BK_3 *Extremophiles* doi: 10.1007/s00792-013-0563-3, 2013.

Maria Celisa Santimano & **Meenal Kowshik**, Altered growth and enzyme expression profile of ZnO nanoparticle exposed non-target environmentally beneficial bacteria, *Environmental Monitoring and Assessment*. Doi 10.1007/s10661-013-3094-6, 2013.

Maria Celisa Santimano, Ansie Martin, **Meenal Kowshik**, and Angshuman Sarkar, Zinc Oxide Nanoparticles Cause Morphological Changes in Human A549 Cell Line Through Alteration in the Expression Pattern of Small GTPases at mRNA Level, Journal of Bionanoscience Vol. 7, 300–306, 2013.

Vilas Desai, Bhanudas Naik, Narendra Nath Ghosh and **Meenal Kowshik,** Functionalization of AgCl/titania nanocomposite with folic acid - a promising strategy for enhancement of antimicrobial activity, *Science of Advanced Materials* Doi:10.1166/sam.2013.1472, 2013.

Vilas Desai and **Meenal Kowshik,** Synthesis and characterization of fumaric acid functionalized AgCl/titania nanocomposite with enhanced antibacterial activity, *Journal of Nanoscience and Nanotechnology*, 13, doi:10.1166/jnn.2013.7370, 2013

Sushma Jadalannagari, Ketaki Deshmukh, Sutapa Roy Ramanan, **Meenal Kowshik**, Antimicrobial activity of hemocompatible silver doped hydroxyapatite nanoparticles by modified sol-gel technique, *Applied Nanoscience*, DOI 10.1007/s13204-013-0197-x, 2013.

Sachin Seshadri, Anupama S & **Meenal Kowshik,** Biosynthesis of silver nanoparticles by the marine bacterium, *Idiomarina sp. PR58-8, Bulletin of Materials Science,* 35 (7) 1201-1205, 2012.

Sachin Seshadri, Saranya K & **Meenal Kowshik**, Biological Synthesis of Lead Sulfide Nanocrystallites by a marine yeast *Rhodosporidium diobovatum, Biotechnology Progress*, 27 (5) 1464-1469, 2011.

Sushma J, Sandeep More, **Meenal Kowshik** & Sutapa Roy Ramanana, Low temperature synthesis of hydroxyapatite nano-rods by a modified sol-gel technique, *Materials Science and Engineering C,* 31, 1534-1538, 2011.

Sachin Seshadri, & **Meenal Kowshik,** Deoxyribonucleic Acid Functionalized with Gold Nanoparticles: A Golden Route to Molecular Biology, Journal of Bionanoscience, 5, 18-25, 2011.

Saranya K, **Meenal Kowshik** & Sutapa Roy Ramanan, Synthesis of hydroxyapatite nanopowders by sol-gel emulsion technique, *Bulletin of Materials Science* 34 (7)1749-53, 2011.

Bhanudas Naik, Vilas Desai, **Meenal Kowshik**, Vadakkethonippurathu Sivankutty Prasad, Gerard Franklyn Fernando, Narendra Nath Ghosh, Synthesis of Ag/AgCl–mesoporous silica nanocomposites using a simple aqueous solution-based chemical method and a study of their antibacterial activity on E. coli, *Particuology*, 9:243-247, 2011.

M.M. Bijeesh, S. Arunkarthick, Arvind Krishanan, Nishith Rastogi, Geetha K. Varier, **Meenal Kowshik** and P.Nandakumar, Construction of a Simple Confocal Microscope, *Kiran*, 22:26-28, 2011.

Desai V & **Kowshik M**, Antimicrobial activity of titanium dioxide nanoparticles synthesized by sol gel process, *Research Journal of Microbiology,* 4:97-103, 2009.

Kakarlapudi R, Mulage P, Sharma S and **Kowshik M,** Biological synthesis of silver nanoparticles using marine bacterial culture isolated from the west coast of India, *Proceedings of International Conference on Applied Bioengineering*, Sathyabhama University, Chennai, 12-15, 2007.

Kowshik M, Ashtaputre S, Kharrazi S, Vogel W, Urban J, Kulkarni SK and Paknikar KM Extracellular synthesis of silver nanoparticles by a silver-tolerant yeast strain MKY3, *Nanotechnology,* 14: 95-100, 2003..

Kowshik M, Deshmukh N, Vogel W, Urban J, Kulkarni SK and Paknikar KM, Microbial synthesis of semiconductor CdS nanoparticles, their characterization, and their use in the fabrication of an ideal diode, *Biotechnology and Bioengineering,* 78: 583-588, 2002.

Kowshik M, Vogel W, Urban J, Kulkarni SK and Paknikar KM, Microbial synthesis of semiconductor PbS nanocrystallites, *Advanced Materials,* 14: 815-818, 2002.

Kowshik M and Paknikar K M, Biological strategies for the production of metal-based nanocrystallites, *Physics Education,* 19: 31 -40, 2002.

Kowshik M and Nazareth S, Biosedimentation of mine tailngs by *Fusarium solani, Journal Industrial Pollution Control,* 17: 341-346, 2001.

Kowshik M and Nazareth S, Metal tolerance of *Fusarium solani, Ecology, Environment and Conservation,* 6: 391-395, 2000.

Kowshik M and Nazareth S, Biosorption of metals by *Fusarium solani, Asian J. Microbiol. Biotech. & Env. Sc*. **1** 57-61, 1999.

Patents

1. A process for manufacturing gold metal nanoparticles
   Indian Patent No. 205346

2. A process for manufacturing metal sulfide nanoparticles
   Indian Patent No. 202756

3. A process for manufacturing silver metal nanoparticles
   Indian Patent No. 202757

4. Nanomaterial based DNA Delivery vehicle for bacterial transformation, Provisional Indian patent application number 1529/MUM/2013

Invited talks

- Naturally Occurring Nanoparticles, at the Monsoon International Workshop on Green Nanotechnology organized by Sam Higginbottom Institute of Agriculture, Technology & Science and University of Missouri, at Bogmallo Beach Resort Goa, from August 6-7th.
- Silver Nanocomposites for Biomedical Applications, at the Select Nanomedicine 2013 conference, at Barcelona, Spain during 11th and 12th of April 2013
- Biocompatible Silver Hydroxyapatite Nanoparticles Based Thin Film Coatings With Good Antimicrobial And Antibiofilm Activity at the 1st International Symposium on nanomedicine in drug delivery and cancer diagnosis, University of Delaware, Newark, USA. August 16-17th 2012
- Functionalization Of Silver-Titanium Dioxide Nanoparticles, A Novel Strategy For Enhancement Of Antimicrobial Activity at the Green Nanotechnology, 1st international workshop at Vishveshwaraya technological University, Belgaum, November 26-27th 2012
- Bionanomaterials: Synthesis and potential applications at UGC Sponsored National seminar on Nanomaterials and their Applications, 13 – 14 March 2012, KLE Society's Raja Lakhamangouda Science Institute, Belgaum-Karnataka
- Biological synthesis and applications of nanomaterials at UGC Sponsored National seminar on Nanomaterials: Synthesis, Characterization and Applications, 2-3 February 2012, Chowgule College of Arts and Science, Margao-Goa.
- Nanotechnology in Biomedical Applications for National Science Day celebration on 28th Feb 2012 at Dhempe College of Arts and Science, Panaji Goa.

PhD. Thesis Supervised

Synthesis of sol-gel based titanium dioxide photocatalyst: investigations on their modification, interaction with metal ions, and antimicrobial activity, Vilas Desai, Submitted in April 2013

Synthesis, characterization of nanostructured TiO_2 based composites and studies on their versatile biomedical applications, Kshipra Naik, In Progress

Biological synthesis of metallic and metal sulfide nanoparticles using halophilic archaea and bacteria, Pallavee Srivastava, In Progress

Mr Mohammed Mansoor Shaik (PhD Student)

Research Associate Supervised

Impact of Metal Oxides and Metallic Nanoparticles Towards Bacteria, Dr Maria Celisa Santimano (DBT RA; 2011-2012)

ME Thesis Supervised

Antibiofilm, cytotoxic and cytocompatible properties of silver hydroxyapatite nanoparticles coating for medical implants, Ketaki Deshmukh, May 2012.

Low temperature synthesis of hydroxyapatite,metal doped hydroxyapatite, hydroxyapatite chitin composite for biomedical applications, Sushma Jadalannagari, December 2011.

MSc Thesis Supervised

Preparation of hydroxyapatite nanopowder by sol gel emulsion technique, K Saranya, December 2008.

Membership of Professional Societies

Association of Microbiologists of India

American Society of Microbiology

Materials Research Society of India

Courses Taught

BIO F111: GENERAL BIOLOGY (Previously BIO C111)

BIO F 212: MICROBIOLOGY (Previously BIO C212)

BIO F211: BIOCHEMISTRY

BIO C331: BIOPHYSICS

BIO C322: ECOLOGY

BIO C332: GENETICS

BIO C 416: IMMUNOLOGY

BIO C391: INSTRUMENTAL METHODS OF ANALYSIS

BIO C 231: BIOLOGY PROJECT LABORATORY

TA C211: MEASUREMENT TECHNIQUES 1(Biology)

BIO G514: MOLECULAR IMMUNOLOGY

BIO G513: MICROBIAL FERMENTATION TECHNOLOGY

BIO G651: PROTEIN AND ENZYME ENGINEERING

BITS C382: READING COURSE

Project Based Courses

BITS C313; BITS C314: LABORATORY ORIENTED PROJECT

BITS C323; BITS C324: STUDY ORIENTED PROJECT

BITS G620; PROFESSIONAL PRACTICE I

BITS G621; PROFESSIONAL PRACTICE II

BITS G540 RESEARCH PRACTICE

BITS C421T THESIS

BITS 629T DISSERTATION

BIO C 491 SPECIAL PROJECTS