

Purnima Basu Neogi

Current Position

Assistant Teaching Professor, School of Science, Engineering, and Technology

Penn State Harrisburg, Middletown, PA 17057

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Research Interests

Plant tissue culture and genetics. Somatic embryogenesis, secondary metabolite production through tissue culture. Engineering fatty acid metabolism in Cotton. Nano-Biophotonics using plant and cancer cells.

Education

1996 Ph.D. in Life Science (Plant Tissue Culture and Genetics) Devi Ahilya University, Indore, India
• Organogenesis, Embryogenesis and Anthocyanin accumulation in *in vitro* cultures of *Hyoscyamus muticus* L.

1991 Master of Philosophy (Life Science), Devi Ahilya University, Indore, India
• Cell Culture Studies in Barley (*Hordeum vulgare*)

1989 Master of Science (Genetics), Bhopal University, Bhopal, India

1987 Bachelor of Education (Biology, Chemistry), Bhopal University, India

1986 Bachelor of Science (Botany, Zoology, Chemistry) Bhopal University, Bhopal, India

Training

2023 **Assistant Teaching Professor, Biological Sciences, School of Science, Engineering, and Technology, Penn State Harrisburg, Middletown, PA.**

- **Teaching BIOL 110: Basic Concepts and Biodiversity, BIOL 110 Lab, BIOL 220W Populations and Communities, BIOL 240 W Function and Development of Organisms, BISC 002 : Genetics and evolution, SC 120N Plant people and Places, BIOL: 424 Uses of Plants, BIOL 406 Symbiosis**

2019-2022 **Lecturer and Faculty Advisor, Dept. of Biological Sciences, UNT, Denton, Texas.**

Teaching at least two courses per semester. I teach large classes with sometimes more than 150 students. I advise undergraduate students regarding their course work (2-hour appointment and 2-hours open advising sessions per week), Mentored undergraduate research students.

2011-2018 **Adjunct Lecturer/Research Scientist, Dept. of Biological Sciences, UNT, Denton, Texas.**

- Teaching Introductory Biology, Medical Terminology, Biology for Science Majors II, Human Heredity.
- Research in Bio-nanotechnology: Bio imaging using Zinc oxide nanoparticles in *Arabidopsis thaliana*, Zebra fish. ZnO nonlinear optical markers have been used to image plant cells with high resolution. Cancer

cell imaging using second harmonic microscopy.

- 2005-2011** **Lecturer/Research Scientist, (Dr. Kent D. Chapman) Dept. of Biological Sciences. UNT, Denton, Texas.**
- Engineering seed value in cotton. Reduced oil and protein accumulation in cotton seeds transformed with a Brassica non-functional allele of a *delta-12 desaturase*
 - Simultaneous quantification of oil and protein in cottonseed by low-field time-domain nuclear magnetic resonance
- 2003-2005** **Lecturer/ Postdoctoral Research Associate, Dept. of Biological Sciences. UNT, Denton, Texas.**
- Agrobacterium rhizogenes-mediated transformation studies in *Medicago truncatula*.
- 1998 - 2001** **Fellow of Science and Technology of Japan, National Institute of Agrobiological Resources, Tsukuba, Japan.**
- Development of efficient morphological markers using a) *ipt* (*Isopentenyl transferase*) gene in rice b) development of herbicide resistance in rice using *bar* gene (*Phosphophinothricin acetyl transferase*) c) *Protox* (*Protoporphyrinogen oxidase*) in *Arabidopsis*.
- 1996 – 1998** **Postdoctoral Researcher, Department of Chemical Engineering, Yamagata University, Japan.**
- Somatic embryogenesis, protoplast culture and regeneration in Safflower (*Carthamus tinctorius* L.)
 - Carthamine pigment accumulation in callus and suspension cell cultures of *Carthamus tinctorius* L.
- 1991 - 1996** **Research Assistant, Dept. of Life Sciences, Devi Ahilya University Indore, India.**
- Somatic embryogenesis and direct regeneration from various explants in *Hyoscyamus* species
 - Regeneration of haploid plants from anther and ovary culture in *Hyoscyamus* species
 - Transformation studies and secondary metabolite production including alkaloids and anthocyanin from callus and root.

Teaching and advising

2023-2025 **School of Science, Engineering, and Technology
Penn State Harrisburg**

➤ **Courses Teaching at present:**

Basic Concepts and Biodiversity (BIOL110)
 Basic Concepts and Biodiversity (BIOL110L)
 Genetics and evolution (BISC 002)
 Populations and Communities (BIOL: 220W)
 Function and Development of Organisms (BIOL: 240W)
 Function and Development of Organisms (BIOL: 240M)
 Plant people and Places (SC120N)
 Uses of Plants (BIOL: 424)
 Symbiosis (BIOL:406)

2004-
2022

**Biological Sciences, University of North Texas, Denton, TX
(2 undergraduate level courses per semester)**

◆ ***Courses Taught:***

Basic Concepts and Biodiversity (BIOL110)
Genetics and evolution (BISC 002)
Uses of Plants (BIOL: 424)
Genetics (BIOL 3451)
Genetics Lab (BIOL 3452)
Contemporary Biology (BIOL 1112)
Biology for Science Majors I (BIOL 1710)
Honors Biology for Science Majors I (BIOL 1711)
Biology for Science Majors II (BIOL 1720)
Honors Biology for Science Major II (BIOL 1722)
Medical Terminology (BIOL 3500)
Human Heredity (BIOL 3350)

Faculty advising duties:

- Guide undergraduate students to understand the university's core curriculum, assist them to plan their course work, and develop an appropriate educational program outline in their chosen major.
- Meet with current and prospective students for their advising questions related to major/minor requirements in Biological Sciences.
- Course evaluation for the College of Sciences. Evaluate transfer credits prior to orientation to facilitate the transfer process for students and the college.
- Assist students to find appropriate resources available.
- Offer career counseling advice to students along with academic advising.
- Respond to advising questions *via* email.
- Process course enrollment requirements and requests through CSRS system. Help undergraduate students with research opportunities in our department and within the College.
- Participate in orientations, advising seminars, accepted students program: campus fair and academic fair, majors fest information fair, campus and community resource fair, meeting with Pre-Med student organization, participation in recruitment and retention activities.

Teaching and Instruction training programs:

- **Academic Advising: "Advising Matters:** The Importance of a Shared Understanding of Academic Advising" and "Relationships in Academic Advising: Establishing Rapport and Building Trust with Students "The University Advising Council, Academic Support and Advising Services, Penn State Harrisburg, February 2025.
- **Annual Program Assessment Workshop:** Organized by The Center for Teaching Excellence, November 2024.
- **Academic Advising:** The University Advising Council, Academic Support and Advising Services, Penn State Harrisburg, October 2024.

- **"GenAI Summer Splash: Riding the Generative AI Wave for Teaching":** Harrisburg Center for Teaching Excellence, HBG, July 2024.
- **Supporting Linguistically Diverse Students for Academic Success:** organized by the center for Teaching Excellence at Penn State Harrisburg, **March 2023**.
- **Building Cultural Competence for Inclusive Classrooms:** organized by the center for Teaching Excellence at Penn State Harrisburg, **March 2023**.
- **AAC&U TIDES Institute:** [Teaching to Increase Diversity and Equity in STEM \(TIDES\) Institute](#) organized by the Association of American Colleges and Universities (AAC&U) to learn new ways to teach and make all STEM students feel welcome, safe, and accepted in their classrooms and the greater scientific community, **Summer, 2021**.
- **Equity and Diversity Workshop:** ABCA training, "Inclusive Practices in the STEM Classroom" at UNT, **December 2021**.
- **Team-Based Learning workshop by Michele and Bruce:** Mastering Team-Based Learning at UNT organized by faculty success on how to implement TBL in a fully-online course. Demonstration of effective ways to facilitate discussions within the online classrooms, **February 2020**.
- **"Women Driving STEM":** Dr. Richard Golden from UNT's Jewish and Israel Studies Program organized a panel discussion on the topic "WOMEN DRIVING STEM "by the American Friends of the Hebrew University, **January 2021**.
- **Defining Neurodivergence** by Dr. Lauren Mathew: Attended the session presented by The NTFMN Leadership Team, in **February 2020**.
- **Teaching Portfolio Workshop** organized by the Non-Tenure Track Faculty Mentoring Network, **December 2020**.
- **Active Learning Strategies for Hybrid Classrooms** organized by the Non-Tenure Track Faculty Mentoring Network, **October 2020**.
- **Co-organized "Mobile Summer Institute on Scientific Teaching":** Dr. Lee Hughes and Dr. Mark Burleson at the University of North Texas.: Focus of the Scientific teaching was on Undergraduate STEM Education (MoSI), **May 13-17, 2019**.
- **" Mobile Summer Institute on Scientific Teaching":** Attended summer Institute. The focus of the Scientific teaching was on Undergraduate STEM Education (MoSI) organized by Dr. Lee Hughes and Dr. Mark Burleson at the University of North Texas, **May 15-19, 2017**.
- **"Biology Forum on Undergraduate Education in the Life Sciences" (BIOFUELS)** at UNT

Committees Served

- **Student Affairs Committee:** 2024-2025 Academic Year, Penn State Harrisburg.
- **Assessment Committee Chair:** Biological Sciences, Biology and Science Program, Penn State Harrisburg.
- **Faculty Hiring Committee:** Served as a committee member for hiring Biological Science faculty, Biology and Science Program, Penn State Harrisburg.
- **Recruitment Committee:** Serving as a committee member since Fall 2023, Biology and Science Program, Penn State Harrisburg.

- **Curriculum Committee:** Served as a committee member in Fall 2023 and spring 2024, Biology and Science Program, Penn State Harrisburg.
- **Student Awards committee:** Serving as a committee member since Fall 2023, Biology and Science Program, Penn State Harrisburg.
- **EMRAP committee:** Serving as a committee member for EMRAP since Fall 2024, Biology and Science Program, Penn State Harrisburg.
- **Plant Club Advisor:** Serving as faculty advisor for the student club since Fall 2024.
- **UNT Senate:** Senate member: Committee on the Status of People of Color as a Group VII representative (November 11, 2020- September 2023)
- **Scholarship Committee:** Undergraduate Biological Science Scholarship Committee
- **NTFMN leadership team:** Non-Tenure Track Faculty Mentoring Network
- **Advisory Committees:**
 1. Council of Advisors committee for the College of Sciences
 2. Health Professions Advisory Committee

Mentoring /Research Advising/Outreach activities

- **Honors student research:** Mannat Kaur Oberoi, Abigail Fortini, Katelyn Moyer, Prakriti Pokhrel, Makayla Shutt.
- **Tei-Muno, Dennis** (Special Problem BIOL4900) Effect of radiation on cells.
- **Sayed Ali Abhati** (Co-advisor) [2011] - MS Department of Mechanical and Energy Engineering (2010): Ultrafast laser sampling of a plant tissue and ion conductivity measurement for investigation of light stress generation mechanism.
- **Laurent Coque-** Ph.D., Biological Sciences (Advisor- Rebecca Dickstein) – Hairy root transformation studies in *Medicago truncatula*. [joint publication]
- **Kyung Min Lee-** Ph.D., Department of Mechanical Engineering and Physics (2011): Silver nanostructure sensing platform for maximum-contrast fluorescence cell imaging [joint publication]
- **Ben Urban** – Ph.D., Department of Physics (2012) – Second Harmonic Imaging of *in vivo* plants and cell culture. [joint publication]
- **Sween Butler-** Ph.D., Department of Physics, (2017) - *In-vivo* imaging using nanoscale non-linear optical markers. [joint publication]
- **Somak Das** – TAMS student, summer research (2007) Plant cell culture studies.
- **Mentoring research:** Honors students, Biology and Science Program, Penn State Harrisburg.
- Served as an external reviewer for the proposal in the National Science Foundation panel: Feb 2023
- Science Fair Judge for Hershey Elementary School.

Awards

- Biotechnology Research for Agriculture and Industrial Network (BRAIN) Fellowship (2000) – Ministry of Agriculture, Forestry and Fisheries, Japan
- STA Fellowship (1998)– Japan Science and Technology Agency, NIAR, JAPAN.

- Council of Scientific and Industrial Research (1994), India, Senior Research fellowship.
- Graduate Aptitude Test in Engineering (GATE) (1992) award provided by, All India Council for Technical Education” for perusing doctoral work.

Conferences/Workshops Organized

- Co-Organizer, International Workshop on Nanomaterials in Optoelectronics and Biology (2006), University of North Texas, Denton, Texas.
- Co-Organizer, Japan Society for Promotion of Sciences International Winter school in Nanobiotechnology, (2008), University of North Texas, Denton Texas
- Co-Organizer of 10th Association of Scientist of Indian Origin in America [ASIOA] (2008), Denton, Texas

Technical Training Workshops

- Minispec NMR Training 2006: Bruker Optics Inc, The Woodlands, TX
- Cellular and Molecular fluorescence 2008: Center for Commercialization of Fluorescence Technologies (CCFT), UNT Health Science Center, Fort Worth, TX

Research Funding

Completed:

Team Mentoring grant, September 2021,” Community College Transfer Student Success Initiative”. \$4,200.

Team Mentoring grant, September 2021,” Faculty Initiated Redesign of Stem Courses for All Students”. \$5000.

Charn Ushwachoke International Development Fund, August, 07, “Nano-biophotonics using ZnO nanoparticles.” \$10,000

Invited Lectures

1. Electronic Nanomaterials East, (2014), Beijing "Imaging plants using nonlinear optical properties of materials"
2. International Conference in Nano-medicine (2012), Matsue, Japan, "Multifunctional ZnO nanocrystals as a tool for diagnostics and nano-medicine"

Publications

1. D Reyes, H Heo, ÁM Martínez-Argüello, Y Fujita, PB Neogi, A Neogi, *IEEE Open Journal of Ultrasonics, Ferroelectrics, and Frequency Control*, " [Underwater analyte sensing using a phononic crystal waveguide-based interferometric acoustic spectrometer](#), vol. 4, pp. 216-226, 2024"
2. Sween B, **Purnima Neogi**, Ben Urban, Yasuhisa Fujita, Zhibing Hu, Arup Neogi; ZnO Nanoparticles in Hydrogel Polymer Network for Bio-Imaging. *Glob J Nano*. 2017; 1(5): 555572.

3. Ben E. Urban, **Purnima B. Neogi**, Surendra Kumar Rajpurohit, Pudur Jagadeeshwaran, Yasuhisa Fujita, Arup Neogi, *Optimization of Nonlinear Optical Properties of ZnO nanoparticles for Live Cell Imaging*, IEEE J. Spec. Topic in Quantum Electron, 2012, DOI: 10.1109/JSTQE.2012.2184793
4. Patrick J. Horn, Andrew R. Korte, **Purnima B. Neogi**, Ebony Love, Johannes Fuchs, Kerstin, Strupat, Ljudmilla Borisjuk, Vladimir Shulaev, Young-Jin Lee, Kent D. Chapman, *Spatial mapping of lipids at cellular resolution in embryos of Gossypium hirsutum*, L 2012, Plant Cell 2012, vol. 24 no. 2 622-636
5. Ben E. Urban, **Purnima B. Neogi**, Sween J. Butler, Yasuhisa Fujita, Arup Neogi, *Second harmonic imaging of plants tissues and cell implosion using two-photon process in ZnO nanoparticles*, J. Biophotonics, **4**, 1-9 (2011) DOI 10.1002/jbio.201100076
6. Patrick J. Horn, **Purnima Neogi**, Xenia Tombokan, Supriyo Ghosh and B. Todd Campbell, Simultaneous Quantification of Oil and Protein in Cottonseed by Low-Field Time-Domain Nuclear Magnetic Resonance; 2011; 88, Journal of the American Oil Chemists' Society.
7. Kyung-Min Lee, Arup Neogi, **Purnima Basu Neogi**, Minjung Kim, Bongsoo Kim, Rafal Luchowski, Zygmunt Gryczynski, Nils Calander, and Tae-Youl Choi, Silver nanostructure sensing platform for maximum-contrast fluorescence cell imaging, (2011), Journal of Biomedical Optics 16, 056008.
8. Daiyuan Zhang, Irma L. Pirtle, Stacy J. Park, Mongkol Nampaisansuk, **Purnima Neogi**, Sylvia W. Wanjie, Robert M. Pirtle and Kent D. Chapman Identification and expression of a new delta-12 fatty acid desaturase (*FAD2-4*) gene in upland cotton and its functional expression in yeast and *Arabidopsis thaliana* plants, Plant Physiology and Biochemistry, 2009: 47(6) 462-471.
9. Kent D. Chapman, **Purnima B. Neogi**, Kater D. Hake, Agnes A. Stawska, Thomas R. Speed, Matthew Q. Cotter, David C. Garrett, Thomas Kerby, Charlene D. Richardson, Brian G. Ayre, Supriyo Ghosh, and Anthony J. Kinney. Reduced Oil Accumulation in Cottonseeds Transformed with a *Brassica* Nonfunctional Allele of a Delta-12 Fatty Acid Desaturase (*FAD2*) *Crop Sci.* 2008; 48: 1470-1481
FAD2-2B cDNAs sequence deposited in GenBank (accession number **EU363790**) 2009.
10. Laurent Coque, **Purnima Neogi**, Catalina Pislariu, Kimberly A. Wilson, Christina Catalano, Madhavi Avadhani, D. Janine Sherrier, and Rebecca Dickstein. Transcription of *ENOD8* in *Medicago truncatula* Nodules Directs *ENOD8* Esterase to Developing and Mature Symbiosomes. *MPMI* 21:4 2008: 404-410
11. H. Liddar, J. Li, A. Neogi, **P.B. Neogi**, A. Sarkar, S. Cho, H. Morkoc, "Self-assembled deoxyguanosine based molecular electronic device on GaN, substrates, *Appl. Phys. Lett.*, 92,13309, (2008)
12. **P. B. Neogi**, A. A. Stawska, K.D. Hake, T. R. Speed, M. Q. Cotter, D. C. Garrett, T. Kerby, A. J. Kinney, K.D. Chapman, "Reduced oil and protein accumulation in cotton seeds transformed with a *Brassica* non-functional allele of a delta-12 desaturase (*FAD2*).", American society of plant biologists, Boston, 2006.
13. **P.B. Neogi**, L.Coque, R. Dickstein," The *Medicago ENOD8* nodulin gene encodes an esterase, localizing in specific tissues of root nodules," American society of plant biologists, Boston, 2006.

14. **P. B. Neogi**, M. Nakashima, S. Toki, H. Ichikawa, "Development of an efficient morphological marker using *ipt* (*isopentenyl transferase*) gene in rice", (Communicated '08).
15. J. Li, A. Sarkar, **P. Neogi**, H. Morkoc, A. Neogi, "*Design of hybrid GaN photonic bandgap structures embedded with olegonucleotide based molecular wires for UV-Visible regime*" Extended Advanced International Meeting on Optical Materials, Tucson (2005).
16. M. Nakashima, **P. B. Neogi**, H. Nakamura, N. Mimida, A. Tagiri, H. Onodera, S. Toki, J. Hashimoto, H. Ichikawa, "A D-type cyclin from rice potentially involved in leaf formation," 46th Annual Meeting of the Japanese Society of Plant Physiologists, Niigata, Japan (2005),
17. A. Neogi, J. Li, A. Sarkar, **P.B. Neogi**, and H. Morkoc, "Self-assembled modified deoxyguanosines conjugated to GaN quantum dots for biophotonic applications", *Electronic Letters*, **40**, 1605 (2004).
18. A. Neogi, **P.B. Neogi**, and H. Morkoc, "Radiative Decay Engineering in GaN quantum dots for biomedical application", Applied Physics Society, Austin 2003.
19. M. Nakashima, **P.B. Neogi**, E. Okano, J. Hashimoto, T. Sasaki, and H. Ichikawa, "*Oryza sativa* (*japonica* cultivar- group) *OsCycD* mRNA for cyclin, complete cds., DDBJ/EMBL/Gene Bank nucleotide sequence under the accession no. AB080248 (2002)
20. **P.B. Neogi**, Y. Nishizawa, K. Ono, H. Wabiko, M. Ugaki, S. Toki, H. Ichikawa, "Morphological and Conditional Negative Selection Markers for Efficient Gene Targeting in Rice", Proc. IX Int. Conference on Plant and Genome, pg. 99, (2001)
21. **P.B. Neogi**, S. Endo, H. Ebinuma, H. Wabiko, and H. Ichikawa, "*Agrobacterium tumefaciens* plasmid *pTiAKE10* *iaaM*, *ipt*, *6b* genes for tryptophan monooxygenase" partial and complete cds DDBJ/EMBL/Gene Bank nucleotide sequence under the accession no. AB032122 (1999)
22. **P.B. Neogi** and J. Onodera, "Direct somatic embryogenesis, regeneration and pigment accumulation in *Carthamus tinctorius* L.", Proc. American Asso. for Advancement of Sciences, Anaheim, California (1999).
23. H. Tanaka, **P.B. Neogi**, N. Naoko, Y. Tabei, Y. Ban, T. Kayano and F. Takaiwa, "Regeneration Conditions for Soybean (*Glycin max*(L.) Merr.)", Extended Abstract Ann. Meet, of Japanese Soc. of Breeding (1998).
24. **P. Basu**, S. Chand, "Tropane alkaloids from callus cultures, differentiated roots and shoots of *Hyoscyamus muticus* L." *J Plant Biochem. Biot* 7 (1): 39-42 (1998).
25. S. Chand, **P. Basu**, "Embryogenesis and plant regeneration from callus cultures derived from unpollinated ovaries of *Hyoscyamus muticus* L.", *Plant Cell Rep.* 17 (4): 302-305 FEB 1998
26. **P. Basu**, S. Chand, "*Anthocyanin accumulation in Hyoscyamus muticus* L tissue cultures," *J. Biotech.* 52 (2): 151-159 DEC 10 1996; Erratum:, *J Biotech.* 58 (3): 209-209 DEC 3 1997.