Dr. D.Y. Patil Vidyapeeth's
Dr. D. Y. Patil Biotechnology and Bioinformatics Institute
Mumbai-Bangalore Express High way, Tathawade, Pune 411033
Mail: info.biotech@dpu.edu.in, **Website:** http://biotech.dpu.edu.in

Dr. Ganesh Mahadeo Nawkar

Designation: Assistant Professor

Email ID: ganesh.nawkar@dpu@edu.in

Qualification: Ph.D. Environmental Biotechnology

Area of Specialization: Plant photobiology and developmental biology, Plant abiotic stress response, Crop resilience

Research Interest: With a strong foundation in agriculture and specialized expertise in plant molecular biology, developmental biology, and stress physiology, my research focuses on enhancing crop resilience through plant biotechnology. My work bridges insights from the model plant Arabidopsis to agriculturally critical crops, addressing climate change challenges. I have explored light signaling, abiotic stress interactions, and the role of air channels in plant tissues beyond gas exchange, uncovering their importance in light sensing and optical properties. Currently, I am dedicated to understanding air channel maintenance in crops to develop waterlogging-tolerant varieties with improved hypoxia stress resilience.

EDUCATIONAL QUALIFICATIONS:

	Degree	Year	Subject	University/Institution	% of marks
1.	B.Sc.	2007	Agriculture	Mahatma Phule Krishi Vidyapeeth, Rahuri	87.5%
2.	M.Sc.	2009	Biotechnology	Tamil Nadu Agricultural University, Coimbatore	91.3%
3.	Ph.D.	2016	Environmental Biotechnology	Gyeongsang National University, South Korea	95%

ACADEMIC AND RESEARCH EXPERIENCE:

S.No.	Positions held	Name of the Institute	From	To
1.	Assistant Professor	Dr. D.Y Patil Biotechnology & Bioinformatics Institute, Tathawade, Pune-411033, India	2024 August	Present
2.	Visiting Faculty	Institute of Bioinformatics & Biotechnology (IBB), Savitribai Phule Pune University	2023 August	2024 June

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		(SPPU), Pune, India		
3.	Assistant Professor	Biotechnology Department, Modern College of Arts, Science and Commerce, Savitribai Phule Pune University (SPPU), Pune, India	2023 August	2024 June
4.	Post-doctoral Fellow	University of Lausanne, Switzerland	2018 March	2023 February
5.	Post-doctoral Fellow	Gyeongsang National University, South Korea	2016 March	2017 November

AWARDS AND ACHIEVEMENTS:

S.No	Name of Award	Awarding Agency	Year
1.	Special Award for Outstanding Dedication in Practical Teaching	University of Lausanne, Switzerland.	2021
2.	Marie Curie Post-doctoral Fellowship	European Commission	2018
3.	Outstanding Poster Presentation Award	KSMCB International Conference, South Korea	2017
4.	Brain Korea 21 Plus (BK21 Plus) Scholarship	Korean government	2017
5.	National Research Foundation of Korea Scholarship	Korean government	2015
6.	Brain Korea 21 Plus (BK21 Plus) Scholarship	Korean government	2014
7.	Tmt. Ammani Ammal Award (University Gold Medal)	Tamil Nadu Agricultural University, India	2010
8.	Dr. M. V. Rao and Shri. P. S. Rama Mohan Rao Award	Tamil Nadu Agricultural University, India	2010
9.	Department of Biotechnology (DBT) Scholarship	Indian government	2007
10.	ICAR Junior Research Fellowship	Indian government	2007 (declined)

REVIEWER:

No.	Year	Affiliation	Details
1	2023	Review Editor	On the Editorial Board of Photomorphogenesis and Development (specialty section of Frontiers in Photobiology)
2	2023	Guest Editor	Special Issue on Effects of Environmental Stresses on Plant Physiology (Life journal)

SCIENTIFIC COMMITTEE MEMBER:

No.	Year	Affiliation	Details
1	2014	Member	Korean Society for Molecular and Cellular Biology
2	2017	Member	American Society of Plant Biologists

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PUBLICATIONS:

(https://scholar.google.ch/citations?user=_8tkw-YAAAAJ&hl=en)

1. Nawkar GM*, Legris M, Goyal A, Schmid-Siegert E, Fleury J, Mucciolo A, De Bellis D, Trevisan M, Schueler A, Fankhauser C. (2023). Air channels create a directional light signal to regulate hypocotyl phototropism. **Science.** 382 (6673), 935-940. (**IF**=63.83)
2. Kang CH*****, Lee ES*****, Nawkar GM*, Park JH, Wi SD, Bae SB, Chae HB, Paeng SK, Hong HC, Lee SY. (2021). Constitutive photomorphogenic 1 Enhances ER stress tolerance in Arabidopsis. **Int J Mol Sci.** 22 (19), 10772. (**IF**=6.2)
3. Park JH, Kang CH, Nawkar GM, Lee ES, Paeng SK, Chae HB, Chi YH, Kim WY, Yun DJ, Lee SY. (2018). EMR, a cytosolic-abundant ring finger E3 ligase, mediates ER-associated protein degradation in Arabidopsis. **New Phytol.** 220 (1), 163-177. (**IF**=9.4)
4. Nawkar GM*, Lee ES, Shelake RM, Park JH, Ryu SW, Kang CH, Lee SY. (2018). The Activation of the transducers of unfolded protein response in plants. **Front. Plant Sci.** 9,214. (**IF**=5.6)
5. Lee BD, Kim MR, Kang MY, Cha JY, Nawkar GM, Sakuraba Y, Lee SY, Imaizumi T, McClung RC, Kim WY, Paek NC. (2017). The F-box protein FKF1 inhibits dimerization of COP1 in the control of photoperiodic flowering. **Nat.Com.** 8(1),1-10. (**IF**=16.6)
6. Nawkar GM*, Kang CH*, Maibam P*, Park JH, Jung YJ, Chae HB, Chi YH, Jung IJ, Kim WY, Yun DJ, Lee SY. (2017). HY5, a positive regulator of light signaling, negatively controls the unfolded protein response in Arabidopsis. **PNAS.** 114(8):2084-2089. (**IF**=11.1)
7. Nawkar GM*****, Maibam P*, Park JH, Woo SG, Kim CY, Lee SY, Kang CH. (2017). In silico study on Arabidopsis BAG gene expression in response to environmental stresses. **Protoplasma**. 254(1):409-421. (**IF**=2.9)
8. Chi YH, Melencion SM, Alinapon CV, Kim MJ, Lee ES, Paeng SK, Park JH, Nawkar GM, Jung YJ, Chae HB, Kang CH, Lee SY. (2017). The membrane-tethered NAC transcription factor, AtNTL7, contributes to ER-stress resistance in Arabidopsis. **Biochem Biophys Res Commun**. pii: S0006-291X (17)30072-4. Doi: 10.1016/j.bbrc. (**IF**=3.32)
9. Kang CH, Lee YM, Park JH, Nawkar GM**,** Oh HT, Kim MG, Lee SI, Kim WY, Yun DJ, Lee SY. (2016). Ribosomal P3 protein AtP3B of Arabidopsis acts as both protein and RNA chaperone to increase tolerance of heat and cold stresses. **Plant Cell Environ**. doi:10.1111/pce.12742. (**IF**=6.36)
10. Maibam P*****, Nawkar GM*, Park JH, Sahi VP, Lee SY, Kang CH. (2013). The influence of light quality, circadian rhythm, and photoperiod on the CBF-mediated freezing tolerance. **Int J Mol Sci.** 14:11527-11543. (**IF**=6.2)
11. Nawkar GM*****, 10. Maibam P*, Park JH, Sahi VP, Lee SY, Kang CH. (2013). UV-induced cell death in plants. **Int J Mol Sci.** 14:1608-1628. (**IF**=6.2)
12. Chae HB, Moon JC, Shin MR, Chi YH, Jung YJ, Lee SY**,** Nawkar GM, Jung HS, Hyun JK, Kim WY, Kang CH, Yun DJ, Lee KO, Lee SY. (2013). Thioredoxin reductase type C (NTRC) orchestrates enhanced thermotolerance to *Arabidopsis* by its redox-dependent holdase chaperone function. **Mol Plant.** 6(2): 323-336. (**IF**=27.5)
13. Kim SY, Jung YJ, Shin MR, Park JH, Nawkar, GM, Maibam P, Lee ES, Kim KS, Paeng SK, Kim WY, Lee KO, Yun DJ, Kang CH, Lee SY (2012). Molecular and functional properties of three different peroxiredoxin isotypes in Chinese cabbage. **Mol Cells**. 33: 27-33. (**IF**=4.25)
14. Kim WY, Lee SY, Jung YJ, Chae HB, Nawkar GM, Shin MR, Kim SY, Park JH, Kang CH, Chi YH, Ahn IP, Yun DJ, Lee KO, Kim YM, Kim MG, Lee SY (2011). Inhibitor of apoptosis (IAP)-like protein lacks a baculovirus IAP repeat (BIR) domain and attenuates cell death in plant and animal systems. **J Biol Chem**. 286(49):42670-42678.(**IF**=5.48)

15. Kim SY, Paeng SK, Nawkar GM**,** Shin MR, Kim SY, Park JH, Kang CH, Chi YH, Ahn IP, Yun DJ, Lee KO, Kim YM, Kim MG, Lee SY. (2011). The 1-Cys peroxiredoxin, a regulator of seed dormancy, functions as a molecular chaperone under oxidative stress conditions. **Plant Sci**. 181:119-124. (**IF**=5.2)

(* First author equal contributions)

BOOK CHAPTERS:

1. Nawkar GM*****†, Khare T*, Kumar V, Shelake RM. (2024). Light signaling and plant secondary metabolites. *In:* Nikalje GC *et al.* (eds)., Plant Secondary Metabolites and Abiotic Stress. Wiley. United Kingdom. († Corresponding author)

CERTIFICATIONS:

1. "Train the Trainer" course at the University of Lausanne (March 8 – 11, 2022).
2. Online course, "Writing in the Science," offered by the Stanford University (23 June 2020)
3. "First-steps with R in Life Sciences" course at the University of Lausanne (June 3 – 4, 2020).
4. Workshop on Illustrator provided by the Skills for Scientist program at UNIL (https://www.unil.ch/skillsforscientists/en/home/menuinst/workshops-and-events/previous-workshops/2021.html) to improve my figure preparation skills.

EPIGEUM (Research Skill Courses):

1. "Data Management Plan" course at the University of Lausanne (25 – 26 January 2021).
2. Microscopy course offered by the Central Imaging facility at UNIL (https://cif.unil.ch/courses-available-through-the-cif/).
3. Online training sessions organized by Zeiss Microscopy (https://www.zeiss.com/microscopy/int/cmp/afs/21/webinar-series) to update my microscopy skills.

CONFERENCES (Abstracts/Oral/Poster):

Invited talks/ Oral presentations:

1. Hypocotyl optics regulate directional growth towards light. Young Researchers Symposium on Plant Photobiology (YRSPP), Freiburg, Germany. *(Abstract selected for a talk on 10th March 2022.)*
2. Effect of the light environment -limiting conditions- on plant growth and defense. National Symposium on "Plant Health Management". Navsari Agriculture University, Gujrat. *(Invited talk on 3rd November 2020 online mode).*
3. How is the light gradient formed during phototropism across the Arabidopsis hypocotyl? Young Researchers Symposium on Plant Photobiology (YRSPP), Cologne, Germany. *(Abstract selected for a talk on 5th October 2018.)*
4. Characterization of Arabidopsis inhibitor of apoptosis lacking a baculovirus IAP repeat (BIR) domain plays (IAP)-like protein role in cell death pathway in plant and animal systems. 24th International Conference on Arabidopsis Research (ICAR), Sydney, Australia. *(Abstract selected for a talk in a Workshop on 27th June 2013).*
5. Exploring the mechanisms of directional light sensing in plants. Mini-symposium organized by Humboldt Academy Pune at Biochemical Sciences Division, CSIR-NCL, Pune, India. (*Invited talk on 8th November 2024*).

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Poster presentations:

1. An ABC transporter mutant with a transparent hypocotyl shows reduced phototropism. International Symposium on Plant Photobiology (ISPP), Cold Spring Harbor Laboratory, USA. (Online mode).
2. ABC transporter mutant with transparent hypocotyl showed reduced phototropism. International Symposium on Plant Photobiology (ISPP), Barcelona, Spain.
3. Transcriptional Response of Arabidopsis BAG Genes to Environmental stresses. The 27th International Conference of the Korean Society for Molecular and Cellular Biology (KSMCB), Seoul, South Korea.
4. Molecular and functional characterization of peroxiredoxins in Chinese cabbage. The 3rd International GNU Symposium on Agrobiotechnology, Jinju, South Korea.
5. Heat-induced chaperone activity of serine/threonine protein phosphatase 5 enhances thermotolerance in Arabidopsis thaliana. International Symposium on Plant Photobiology, Beijing, China.

WORKSHOPS:

1. Successfully organized and conducted a *National Hands-on training workshop on "Techniques in Molecular Biology"* from *13/09/2023-16/09/2023* at Modern College, SPPU, Pune.
2. Successfully organized and conducted a *Hands-On-Training Workshop on "Aquatic Animal Health Management"* from *12/04/2024-13/04/2024* at Modern College., SPPU, Pune.

BIOINFORMATICS AND BIOTECHNOLOGY SKILLS:

Bioinformatics Skills

1. **Sequence Analysis**: BLAST searches, sequence alignment, and annotation using tools like NCBI, PLAZA, and Ensembl Plants.
2. **Gene Expression Analysis**: RNA-Seq data processing and interpretation using bioinformatics pipelines.
3. **Phylogenetic Analysis**: Construction of evolutionary trees to study gene conservation across species.
4. **Promoter and Cis-Regulatory Element Identification**: Analysis using tools like PlantCARE and PLACE databases.
5. **Genome Editing Target Design**: CRISPR guide RNA design and off-target prediction using bioinformatics tools.
6. **Database Management and Visualization**: Familiarity with tools like R for data processing and graphical representation.

Biotechnology Skills

1. **Molecular Cloning**: PCR, restriction digestion, ligation, and transformation techniques.
2. **Plant Genetic Transformation**: Proficiency in *Agrobacterium*-mediated transformation.
3. **Genome Editing**: CRISPR/Cas9-mediated genome editing and promoter activation systems.
4. **Gene Expression Analysis**: Quantitative RT-PCR and reporter gene assays.
5. **Protein Expression and Purification**: Expertise in recombinant protein production using bacterial systems.
6. **Microscopy**: Fluorescence microscopy and confocal imaging for cellular and anatomical studies.
7. **Plant Physiological Measurements**: Photosynthetic parameters, gas exchange analysis, and stress physiology assays.
8. **Plant Stress Analysis**: Expertise in biotic and abiotic stress experiments, including hypoxia tolerance and waterlogging stress.