

# Thiya Mukherjee

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## Career Summary:

- I am a plant biologist with established expertise in plant physiology, biochemistry and molecular biology, cellular and developmental biology, and plant physiology.
- I am interested to investigate how central metabolism is linked to plant development. Unraveling this mystery is the key to solve the continuous threat to crop production and survivability under environmentally restricted conditions.
- 6+ years of post-PhD experience in plant and microbial carbohydrate metabolism, lipid metabolism, plant cellular and development and abiotic stress-tolerance.
- I strive for my science to advance sustainable agriculture throughout the world.

## Education:

2010-2016 Texas Tech University, Lubbock, TX

Biology, Ph.D.

2002-2007 University of Calcutta, Kolkata, WB, India

Botany, (B.Sc. and M.Sc.)

## Professional Experience:

2025- Texas A&M University-San Antonio, San Antonio, TX

Assistant Professor

2020- 2024 Donald Danforth Plant Science Center, Olivette, MO

Research Scientist

2017-2019 Kansas State University, Manhattan, KS

Post-Doctoral Associate

2016-2017 Complex Carbohydrate Research Center, UGA, Athens, GA

Post-Doctoral Associate

2008-2009 University of Calcutta, Kolkata, WB, India

Project Associate

## Publications:

### In preparation:


- GmSDP1 suppression alters carbon-partitioning over development and improves soybean seed size by increasing cell expansion. (2025) (**\*First and corresponding authorship**)
- Genetic alteration of UDPGDH and USPase activity in soybean seeds redirect carbon allocation towards oil biosynthesis. (2025) (**First authorship**)

### Under review:

- ◆ Kataya A, Nascimento da Silva JR, Xu C, Garneau M, Koley S, Kimberlin A, **Mukherjee T**, Mooney B, Allen D, Bates P, Koo A, Xu D and Thelen J. Comparative omics reveals unanticipated metabolic rearrangements in a high-oil mutant of plastid acetyl-CoA carboxylase (2024). (**under review in Journal of Proteome Research**)

### Published:

- ◆ **Mukherjee T** \*, Kambhampati S, Morley SA, Durrett TP and Allen DA \*. The Developmental Partitioning of Carbon Flux in Oil seeds (2024). **Plant Physiol.** <https://doi.org/10.1093/plphys/kiae595> (**\* indicates co-corresponding authors**)
- ◆ Ahmad B, Lerma-Reyes R, **Mukherjee T**, Nguyen HV, Weber AL, Schulze WX, Comer JR and Schrick K. Nuclear localization of HD-Zip IV transcription factor GLABRA 2 is driven by importin $\alpha$ (2024). **J Exp Bot.** doi:10.1093/jxb/erae326
- ◆ Wojciechowska I, **Mukherjee T**, Knox-Brown P, Hu X, Khosla A, Subedi B, Ahmad B, Matthews GL, Ashley AP, Thompson KA, Peery ST, Szlachetko J, Thalhammer A, Hinch DK, Skirycz A, Schrick K (2024). Arabidopsis PROTODERMAL FACTOR 2 binds lysophosphatidylcholines and transcriptionally regulates phospholipid metabolism. **New Phytol.** doi: <https://doi.org/10.1111/nph.19917> (**\*\* highlighted in Commentary**)

- ♦ **Mukherjee T**, Tully TLA, Allen DK. GmMFT: a potential step forward in soybean breeding for high oil and yield (2023). *New Phytol.* doi: 10.1111/nph.18950
- ♦ Koley S, Chu KL, **Mukherjee T**, Morley SA, Klebanovych A, Czymmek KJ, Allen DK. Metabolic synergy in Camelina reproductive tissues for seed development (2022). *Sci. Adv.* doi: 10.1126/sciadv.abo7683
- ♦ **Mukherjee T**, Subedi B, Khosla A, Begler EM, Stephens PM, Warner AL, Lerma-Reyes R, Thompson KA, Gunewardena S, Schrick K (2022). START domain mediates Arabidopsis GLABRA 2 transcription factor dimerization and turnover independently of homeodomain DNA binding. *Plant Physiol.* 00:1-20 doi: 10.1093/plphys/kiac383 (\*\* highlighted in News and Views)
- ♦ Aznar-Moreno JA<sup>1</sup>, **Mukherjee T**<sup>1</sup>, Morley SA, Duressa D, Kambhampati S, Chu KL, Koley S, Allen DK, Durrett TP (2022). Suppression of *SDP1* improves soybean seed composition by increasing oil and reducing undigestible oligosaccharides. *Front. Plant Sci.* 13 doi:10.3389/fpls.2022.863254 (1 indicates equal contribution)
- ♦ **Mukherjee T**, Lerma-Reyes R, Thompson K, Schrick K (2019). Making glue from seeds and gums: working with plant-based polymers to introduce students to Plant Biochemistry. *Biochem. Mol. Biol. Educ.* 47:468-475. doi:10.1002/bmb.21252. 
- ♦ **Mukherjee T**, Gitz D, Payton P, Kanayama Y, Granot D, Holaday AS (2018). Does over expression of tomato fructokinase (*LeFRK1*) in cotton enhance yield? *J. Cotton Sci.* 22: 183-190.
- ♦ Paper J, **Mukherjee T**, Schrick K (2018). Bioorthogonal click chemistry for fluorescence imaging of choline phospholipids in plants. *Plant methods* 14: 31 doi: 10.1186/s13007-018-0299-2
- ♦ Li Z, **Mukherjee T**, Bowler K, Namdari S, Snow Z, Prestidge S, Carlton A, Bar-Peled M (2017). A four-gene operon in *Bacillus cereus* produces two rare spore-decorating sugars. *J.Biol.Chem.* 292: 7636-7650. doi: 10.1074/jbc.M117.777417
- ♦ **Mukherjee T**, Ivanova M, Dagda M, Kanayama Y, Granot D, Holaday AS (2015). Constitutively overexpressing a tomato fructokinase gene (*LeFRK1*) in cotton (*Gossypium hirsutum* L.cv. Coker 312) positively affects plant vegetative growth, boll number and seed cotton yield. *Funct. Plant Biol.* 42: 899-908. doi: 10.1071/FP15035

## Grants:

- ♦ Co-PI: Engineering increased protein and oil in soybeans for improved seed value, **United Soybean Board** (\$211,652) (10/1/2024-9/30/2025) Grant number 24-203-S-B-1-A (renewal) (PI: **Dr. Doug Allen**)
- ♦ Co-PI: Engineering increased protein and oil in soybeans for improved seed value, **United Soybean Board** (\$207,183) (10/1/2023-9/30/2024) Grant number 24-203-S-B-1-A (PI: **Dr. Doug Allen**)
- ♦ Postdoctoral Grant: Homeodomain proteins linking lipid metabolism to gene expression in plants. **NIH**, Kansas IDeA Network of Biomedical Research Excellence, Grant number P20 GM103418 (\$37,750) (2018/2019) (PI: **Thiya Mukherjee**)

## Awards:

- ♦ Travel award **26<sup>th</sup> International Symposium on Plant Lipids, ISPL** (2024)
- ♦ Professional development award **Committee for Scientific Training and Mentoring, DDPSC** (2024,2022)
- ♦ Travel award **American Society of Plant Biologists** (2021)
- ♦ Travel award **Gordon Research Conference Plant lipids: Structure, Metabolism and Function** (2019)
- ♦ Travel award **Midwest Section ASPB** (2018)
- ♦ Graduate student oral competition **Southern Section ASPB** (1<sup>st</sup>Place, 2015)
- ♦ Texas Tech University **Annual Biological Sciences Symposium** (1<sup>st</sup> Place: 2013, 2<sup>nd</sup>Place:2012)
- ♦ Texas Tech University **Annual Graduate Student Poster Competition** (1<sup>st</sup> Place: 2012, 2013)
- ♦ Volunteer appreciation certificate **American Society of Plant Biology** (2012)
- ♦ Teaching appreciation award, **TTU/HHMI Science Education Program Center for the Integration of Science Education and Research** (2011)

- ♦ Chakraborty Memorial Merit Award to top MSc. student, **University of Calcutta (2007)**

## Science Communication:

- ♦ **Conference presentations (2011-2024)**
  - From metabolism to development: Understanding the full circle of crop production (*Invited lecture, Texas A & M University-San Antonio, November 2024*)
  - Customizing carbon partitioning: A pathway to enhance soybean seed value and yield (*26<sup>th</sup> International Symposium on Plant Lipids, ISPL, July 2024, University of Nebraska-Lincoln, Lincoln, NEB*)
  - Metabolic Symphony: Exploring Transcription Factors and Carbon-partitioning in Cellular Development (*Seminar Series Invited Speaker: University of Missouri-Kansas City, June 2024*) (*Seminar Series Invited Speaker: Texas A&M-San Antonio, March 2024*) (*Seminar Series Invited Speaker: East Tennessee State University, January 2024*)
  - Can we make a bigger and better soybean? (*Donald Danforth Plant Science Center, Scientific Retreat, 2023, lightning talk*)
  - Altering carbon-allocation in soybean to improve seed value (*Gordon Research Conference, Plant lipids: Structure, Metabolism and Function, Galveston, TX, 2023*)
  - Altering carbon partitioning over development to improve soybean composition (*Molecular and Cellular Biology of the Soybean, Soy 2022, virtual*) and (*Mentoring Seminar Donald Danforth Plant Science Center, 2022*)
  - Analyzing carbon-allocation in soybeans with altered lipid metabolism (*Donald Danforth Plant Science Center, Scientific Retreat, 2021, virtual*)
  - Tweaking biopolymers for crop improvement from gene expression to metabolism (*One Day International Webinar on Innovation and Advances in Plant Science, Purulia, WB, India, 2020, virtual*)
  - Plant HD-Zip transcription factors drive epidermal cell fate via lipid-binding START domains (*Gordon Research Conference, Plant lipids: Structure, Metabolism and Function, Galveston, TX, 2019*)
  - Homeodomain proteins linking lipid metabolism to gene expression in plants (*The 17<sup>th</sup> Annual Kansas IDeA Network of Biomedical Research Excellence (K-INBRE) Symposium and K-INBRE Development Research Project Core meeting, Kansas City, KS, 2019*)
  - A homeodomain transcription factor, its START domain and epidermal development in plants (*Annual Meeting of the Midwest Section of the American Society of Plant Biologists, Ames, IA, 2018*)
  - The effect of constitutively over-expressing the gene for tomato fructokinase (*LeFRK1*) on cotton yield in greenhouse and field trials (**2014**) Constitutively over-expressing a tomato fructokinase gene (*LeFRK1*) in *Gossypium hirsutum* L. enhances seed cotton yield and fiber mass under both well-watered and drought-stressed conditions (**2013**) Enhancing Cotton Fiber Elongation and Cellulose Synthesis by manipulating Fructokinase activity (**2012**) (*Annual Biological Sciences Symposium, Texas Tech University, Lubbock, TX*)
  - Constitutively over-expressing a tomato fructokinase gene (*LeFRK1*) in cotton, *Gossypium hirsutum* L., (c.v. Coker 312) positively affects plant vegetative growth, boll number, and seed cotton yield (**2015**) Constitutively over-expressing a tomato fructokinase gene (*LeFRK1*) in *Gossypium hirsutum* L. enhances seed cotton yield and fiber mass under both well-watered and drought-stressed conditions (**2013**) Enhancing Cotton Fiber Elongation and Cellulose Synthesis by manipulating Fructokinase activity (**2011**) (*Annual Meeting of the Southern Section American Society of Plant Biologists, ssASPB, Dauphin Island, AL 2015, Little Rock, AR 2013, Ocean Spring, MS 2011*)
  - Over seven posters at, *Soybean Breeders Workshop, Physiology and Breeding Innovation (Saint Louis, MO 2023)*, *Annual Meeting of the American Society of Plant Biologists (ASPB 2021 virtual, Portland, OR, 2014, Austin, TX, 2012)*, *Ogallala Aquifer Program Workshop (OAP, Manhattan, KS 2015, Lubbock, TX 2014)*, *Annual Graduate Student Poster Competition, Texas Tech University (Lubbock, TX 2013, 2012)*

## Invitations:

- ♦ Panelist at the 'Industry, Government and Academia Mentorship Panel' **Gordon Research Seminar Plant lipids: Structure, Metabolism and Function (2025). Pomona, CA**

## Service:

- ◆ **Panel judge**  
National Science Foundation Plant Biotic Interactions (PBI) and Physiological Mechanisms and Biomechanics Program (May 2023)
- ◆ **Peer-Review Journal/Grant Reviewer /Review Editor**
  - Plant Physiology (2024)
  - Physiologia Planterum (2024)
  - Journal of Agriculture and Food Chemistry (2024)
  - Frontiers in Plant Physiology (2024)
  - Frontiers in Plant Science (2024)
  - Jove (Guest editor, 2024)
  - NSF grant (Ad hoc reviewer, 2023)
  - NSF panel (Plant Biotic Interactions and Physiological Mechanisms and Biomechanics Programs, 2023)
  - Frontiers in Plant Science (Review editor, 2023)
  - Frontiers in Genome Editing (Review editor, 2023)
  - Plant Science (2023)
  - Horticultural Research (2023)
  - Plant, Cell & Environment (2023)
  - Physiologia Planterum (2022)
  - Journal of Experimental Botany (2022)
  - New Phytologist (2023, 2022)
  - Analytical Biochemistry (2021)
  - The Plant Cell (2020)
  - Scientific Reports (2018)
  - Journal of the American Oil Chemist's Society, JAOCS (2023/2018)

## Leadership Roles:

- ◆ **Co- chair (*The Committee for Scientific Training and Mentoring, DDPSC, 2022-2023*)**
  - Liaison between Danforth non-PI scientific community and DDPSC administration.
  - Responsible for organizing professional development workshops.
  - Provide travel and/professional development awards to CSTM members.
  - Organizing annual career fair BIOBASH, networking and social events
- ◆ **Member of the leadership team (*Sci-ROI-GLOBAL, <https://sciroi.net>, 2022*)**
  - Liaison between Scientific community member across globe and Indian Agbiotech industries.
  - Responsible for organizing scientific and career workshop.
- ◆ **Science representative of DDPSC research (*Agriculture College and Career Night, Waterloo High School, Waterloo, IL, 2022*)**
  - Describing on going scientific research at the DDPSC to embark young students in the plant research.
- ◆ **Moderator, Concurrent Symposium 29: Biotechnological approaches to solve food and nutrition problems (*American Society of Plant Biology, ASPB 2021*)**
  - Welcome audience in the virtual platform.
  - Listen to speakers, understand the subject, and prepare questions for them.
  - Engage audience and prompt them to ask question in the chat section of the zoom virtual platform.
  - Draft questions from the virtual platform to a google document and communicate with partner moderator.
- ◆ **Oral presentation judge (*Collegiate School of Medical and BioScience St. Louis Public Schools, 2021*)**
  - Judged Internship and Capstone projects.
- ◆ **Communication chair (*Kansas State University Post-Doctoral Association, KPA, 2018-2019*)**
  - Liaison between the Office of Vice-President Research and the post-doctoral fellows.
  - Postdoc recruitment record keeping.
  - Co-ordinated professional development workshops like grant writing and resume.

- National Postdoctoral Association week planning (postdoc-mentor luncheon, early career faculty seminar).
- ◆ **Poster presentation judge (*Kansas State University, 2018*)**
  - Judged posters presented by graduate students at the K-State Graduate Research, Arts and Discovery (GRAD) forum.
- ◆ **President (*Texas Tech University Association of Biologists, TTUAB, 2013-2014*)**
  - Hosting a welcoming event incoming for graduate students.
  - Inviting scientists for the departmental seminar series.
  - Hosting monthly meetings with four other partnering officers to set SMART goals for the benefit of the organization.
  - Entrusting responsibilities to fellow officers to support student travel and research awards.
  - Communication with both scientific and non-scientific communities for fundraising.
  - Organizing annual event Annual Biological Science Symposium (TTABSS).

## Teaching Experience:

- ◆ **Teaching Assistant and guest lecturer (2009-2016)**
  - Labs: Cell biology, Introductory Plant Science, Environmental Biology
  - Lecture: Advanced Plant Physiology for graduate students, Biology of Plants for undergraduates.
- ◆ **Student Mentoring (2012-2021)**
  - Trained one graduate and 11 undergraduate students to design and perform experiments at bench and field sites.
- ◆ **Workshop instructor (*GROW and EXCITE summer workshop, Kansas State University, 2018*)**
  - Designed an innovative activity as a part of the Girls Researching Our World (GROW) program to encourage young girls and improve their participation in the STEM world.
- ◆ **Workshop instructor (*Scottish Church College, Kolkata, WB, India, 2012*)**
  - How to prepare for GRE and TOEFL examinations for outgoing undergraduates

## Membership:

- ◆ Botanical Society of Bengal (Life member)
- ◆ American Society of Plant Biologists, ASPB (2010-current)
- ◆ Midwest Section American Society of Plant Biologists, mwASPB (2018-current)
- ◆ Sigma Xi The Scientific Research Honor Society, Kansas State University Chapter (2019-2020)
- ◆ Southern Section American Society of Plant Biologists, ssASPB (2009-2016)
- ◆ American Association for the Advancement of Sciences, AAAS (2009-2010)

## Professional development workshop:

- ◆ 2023 mentee at the Bayer University Mentoring Program