Thiya Mukherjee

15453 Lookout Road, Apt# 1201, Selma, TX 78154
Cell phone:(806)-224-3787, Office phone: (210)-784-2192
Email: tmukherjee@tamusa.edu ; thiyaplantsci@gmail.com
LinkedIN: https://www.linkedin.com/in/thiya-mukherjee-59281010b/
ORCID: https://orcid.org/0000-0003-4053-4501

Career Summary:

Plant biologist with expertise in molecular, cellular, and developmental biology, integrating physiology and biochemistry to understand how central metabolism regulates plant growth and stress resilience. With 15+ years of research in plant and microbial carbohydrate and lipid metabolism, my work aims to uncover metabolic mechanisms that can be leveraged to improve crop productivity and sustainability under environmental challenges.

Academic Appointments:

2025- current	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

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.)

Research Interests:

My research is driven by the goal of advancing sustainable crop improvement to meet the growing global demands for food, fuel, and fiber amid climate challenges. I aim to understand and optimize metabolic pathways that regulate plant development, with a particular focus on enhancing sink tissue function and productivity. Current projects focus on improving seed composition and yield in oilseed crops through metabolic engineering and developmental regulation.

Publications:

In preparation:

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

Published:

- Kumar R, Mulkey S, Shelake RM, Combs-Giroir R, **Mukherjee T**, Allen DK, Clemente TE, Stacey MG, Lorenz AJ, and Stupar RM. Targets and strategies to design soybean seed composition traits **(2025)**. ***TPJ*** https://doi.org/10.1002/tpg2.70115
- Deo B, Muthan B, Cruise T, **Mukherjee T**, Allen DK, and Sanjaya S. Flue gas desulfurization gypsum as a sustainable amendment for coal mine soil reclamation and bioenergy crop production **(2025)**. ***J. Environ Manage.*** DOI: 10.1016/j.jenvman.2025.127296
- Kataya A, Nascimento da Silva JR, Xu C, Garneau M, Koley S, Kimberlin A, **Mukherjee T**, Mooney B, Xu D, Bates P, Allen DK, Koo A, and Thelen J. Comparative omics reveals unanticipated metabolic rearrangements in a high-oil mutant of plastid acetyl-CoA carboxylase **(2025)**. ***J. Proteome Res.*** https://doi.org/10.1021/acs.jproteome.4c00947

- **Mukherjee T** *, Kambhampati S, Morley SA, Durrett TP and Allen DK *. 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 importinα **(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, Hincha DK, Skirycz A, and 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, and 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, and 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, and 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[1], **Mukherjee T [1]**, Morley SA, Duressa D, Kambhampati S, Chu KL, Koley S, Allen DK, and 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, and 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. F1000Prime RECOMMENDED
- **Mukherjee T**, Gitz D, Payton P, Kanayama Y, Granot D, and Holaday AS **(2018).** Does over expression of tomato fructokinase (*LeFRK1*) in cotton enhance yield? ***J. Cotton Sci.*** 22: 183-190.
- Paper J, **Mukherjee T**, and 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, Prestridge S, Carlton A, and 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, and 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:

Awarded:

- Engineering increased protein and oil in soybeans for improved seed value, **United Soybean Board** ($214,955) (10/1/2025-9/30/2026) (Co-PI amount $ 9339.20, subaward to Texas A&M University-SanAntonio) (PI- Doug Allen, primary organization: Donald Danforth Plant Science Center)
- 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) (Co-PI, **Covered salary and research expenses**, PI- Doug Allen, primary organization: Donald Danforth Plant Science Center)
- 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 (Co-PI, **Covered salary and research expenses**, PI- Doug Allen, primary organization: Donald Danforth Plant Science Center)
- Postdoctoral Grant: Homeodomain proteins linking lipid metabolism to gene expression in plants, **National Institutes of Health,** Kansas IDeA Network of Biomedical Research Excellence, ($37,750) (5/1/2018-4/30/2019) Grant number P20 GM103418 **(PI: Thiya Mukherjee)**

Science Communication:

Invited talks /oral presentations: (2011-2025)

- *GmSDP1* suppression: A strategy to improve soybean economic value ***(Invited talk, virtual conference: NC 1203: Lipids in Plants: Improving and developing sustainability of crops 'Lipids of crops', September 2025)***
- Connecting metabolism to development- The role of transcription factors and carbon partitioning ***(Invited talk, Biology seminar series, Texas State University, San Marcos, TX, April 2025)***
- From metabolism to development: Understanding the full circle of crop production ***(Invited lecture, Texas A &M University-San Antonio, San Antonio, TX, November 2024)***
- Customizing carbon partitioning: A pathway to enhance soybean seed value and yield ***(26th International Symposium on Plant Lipids, ISPL, University of Nebraska-Lincoln, Lincoln, NEB, July 2024)***
- Metabolic Symphony: exploring transcription factors and carbon-partitioning in cellular development ***(Seminar Series Invited talk: University of Missouri-Kansas City, Kansas City, KS, June 2024) (Seminar Series Invited talk: Texas A&M-San Antonio, San Antonio, TX, March 2024) (Seminar Series Invited talk: East Tennessee State University, Johnson City, TN, January 2024)***
- Can we make bigger and better soybean? ***(Lightning talk, Donald Danforth Plant Science Center, Scientific Retreat, Saint Louis, MO, June 2023)***
- Altering carbon-allocation in soybean to improve seed value ***(Gordon Research Conference, Plant lipids: Structure, Metabolism and Function, Galveston, TX, February 2023)***
- Altering carbon partitioning over development to improve soybean composition ***(Virtual conference: Molecular and Cellular Biology of the Soybean, Soy 2022, August 2022)*** *and* ***(Mentoring Seminar Donald Danforth Plant Science Center, Saint Louis, MO, October 2022)***
- Analyzing carbon-allocation in soybeans with altered lipid metabolism ***(Virtual conference: Donald Danforth Plant Science Center, Scientific Retreat, Saint Louis, MO, October 2021)***
- Tweaking biopolymers for crop improvement from gene expression to metabolism ***(Invited talk, virtual conference: International Webinar on Innovation and Advances in Plant Science, Purulia, WB, India, November 2020)***
- 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, February 2019)***
- Homeodomain proteins linking lipid metabolism to gene expression in plants ***(The 17th Annual Kansas IDeA Network of Biomedical Research Excellence (K-INBRE) Symposium and K-INBRE Development Research Project Core meeting, Kansas City, KS, January 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, mwASPB, Ames, IA, March 2018)***
- The effect of constitutively over-expressing the gene for tomato fructokinase (*LeFRK1*) on cotton yield in greenhouse and field trials ***(March 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 ***(March 2013)*** Enhancing cotton fiber elongation and cellulose synthesis by manipulating Fructokinase activity ***(March 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 ***(March 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 ***(March 2013)*** Enhancing cotton fiber elongation and cellulose synthesis by manipulating Fructokinase activity ***(March2011) (Annual Meeting of the Southern Section American Society of Plant Biologists, ssASPB, Dauphin Island, AL, 2015, Little Rock, AR, 2013, Ocean Spring, MS, 2011)***

Poster presentations: (2011-2025)

- *GmSDP1* suppression alters carbon-partitioning over development and increases seed size through enhanced cell expansion ***(Gordon Research Conference, Plant lipids: Structure, Metabolism and Function, Pomona, CA, February 2025)*** and *(**Annual Meeting of the American Society of Plant Biologists, ASPB, Milwaukee, WI, July 2025)***
- Customizing carbon partitioning: A pathway to enhance soybean seed value and yield ***(Donald Danforth Plant Science Center, Scientific Retreat, Saint Louis, MO, June 2024)***
- Improving soybean seed value by altering storage reserve biosynthesis and turnover ***(Soybean Breeders Workshop, Physiology and Breeding Innovation, Saint Louis, MO, February 2023)***
- Analyzing carbon-allocation in soybeans with altered lipid metabolism ***(Annual Meeting of the American Society of Plant Biologists, virtual, July 2021)***
- 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 ***(Annual meeting of the Southern Section American Society of Plant Biologists, ssASPB, Dauphin Island, AL, March 2015)***
- Potential role of constitutive over-expression of *LeFRK1* in *Gossypium hirsutum* with respect to yield parameters under field condition. ***(Ogallala Aquifer Program Workshop, OAP, Manhattan, KS, March 2015)***
- The effect of constitutively over-expressing the gene for tomato fructokinase *(LeFRK1)* on cotton yield in greenhouse and field trials. ***(Annual Meeting of the American Society of Plant Biologists, Portland, OR, July 2014*)** and ***(Ogallala Aquifer Program Workshop, OAP, Lubbock, TX, March 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 ***(Annual Graduate Student Poster Competition, Texas Tech University, Lubbock, TX, May 2013)*** and ***(Annual meeting of the Southern Section American Society of Plant Biologists, ssASPB, Little Rock, AR, March 2013)***
- Enhancing cotton fiber elongation and cellulose synthesis by manipulating Fructokinase activity ***(Annual Meeting of the American Society of Plant Biologists, Austin, TX, July 2012)***
- Enhancing cotton fiber elongation and cellulose synthesis by manipulating Fructokinase activity ***(Annual Graduate Student Poster Competition, Texas Tech University, Lubbock, TX, March 2012)*** and ***(Annual meeting of the Southern Section American Society of Plant Biologists, ssASPB, Ocean Spring, MS, March 2011)***

Teaching Interests:

My teaching interests center on helping students understand the mechanisms and biological processes that govern cellular and developmental functions in organisms, with a particular emphasis on plants. A key component of my graduate-level teaching is to provide students with hands-on research experiences through short, curriculum-based projects that integrate experimental inquiry with conceptual learning.

Teaching Experience:

- **Course instructor** ***(Texas A&M University-San Antonio, 2025)***
  Labs: Developmental Biology (Biol 4402), Cell Biology (Biol 2431)
  Lecture: General Biology I- attributes of living system (Biol 1306), Developmental Biology (Biol 4402), Seminar in Integrative Biology (Biol 4101), Cell Biology (Biol 2431), Seminar in Cell/Molecular Biology (Biol 4102), Advanced Topics in Cell and Molecular Biology (Biol 5309), Research Methods in Cell and Molecular Biology (Biol 5304)
- **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.
- **Teaching Assistant and guest lecturer** ***(Texas Tech University, 2009-2016)***
  Labs: Cell biology, Introductory Plant Science, Environmental Biology
  Lecture: Advanced Plant Physiology for graduate students, Biology of Plants for undergraduates

- ***Student Mentoring*** **(**2012-2025)
  Texas A&M University-San Antonio
  Achini Sudusinghe- Thesis Master's
  Aishwarja Dey- Thesis Master's
  Jessey Carreon- Undergraduate, Junior
  Gabriel Garza- Undergraduate, Junior
  Leticia Cole- Undergraduate, Junior
  During postdoctoral and doctoral period
  One graduate and 11 undergraduate students
- **Workshop instructor *(Scottish Church College, Kolkata, WB, India, 2012)***
  How to prepare for GRE and TOEFL examinations for outgoing undergraduates

Awards/Certificates:

- ASPB **Women's Young Investigator Travel Award, WYITA** to attend Plant Biology Annual meeting *(2025)*
- Travel award **Gordon Research Conferences' Predominantly Undergraduate Institution (PUI), GRC** *(2025)*
- Certificate for being **one of the top 250 professors in the US based on total study actions in a course, on CircleIn** *(for General Biology I- Attributes of Living System, Texas A&M University-San Antonio, San Antonio, TX, Spring & Fall 2025)*
- Travel award **26th 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** *(1stPlace, 2015)*
- Texas Tech University **Annual Biological Sciences Symposium** *(1st Place: 2013, 2ndPlace:2012)*
- Texas Tech University **Annual Graduate Student Poster Competition** *(1st Place: 2013, 2012)*
- 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)*

Service:

- **Invited panelist**
  Panel: 'Industry, Government and Academia Mentorship Panel' Gordon Research Seminar Plant lipids: Structure, Metabolism and Function (2025)
- **Discussion leader**
  Session: 'Lipid metabolism and function' Gordon Research Conference: Plant Lipids: Structure, Metabolism and Function (2025)
  Session: 'Psychology and Criminology', RISE symposium: Research, Innovation and Scholarly Exploration, Texas A&M University-San Antonio, TX (2025)
  Concurrent Symposium 29: 'Biotechnological approaches to solve food and nutrition problems' American Society of Plant Biology, ASPB 2021
- **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 (2025, 2024)
  - Crop Science (2025)
  - Physiologia Planterum (2024)
  - Journal of Agriculture and Food Chemistry (2024)
  - Frontiers in Plant Physiology (2024)

- Frontiers in Plant Science (2024)
- NSF grant (Ad hoc reviewer 2025,2023)
- 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 Reseach (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)

♦ **Conference presentation judge**
Oral presentation judge, Organismal Biology, RISE symposium: Research, Innovation and Scholarly Exploration, Texas A&M University-San Antonio, TX (2025)
Oral presentation judge, in the Research Catalyst Global Symposium in the Agricultural and Plant Sciences Program, organized by NaviClar, in collaboration with Euraxess India and supported by the Indian National Young Academy of Sciences (INYAS), in association with the European Molecular Biology Organization (EMBO)
Oral presentation judge, Captone and Internship projects, Collegiate School of Medical and BioScience St. Louis Public Schools (2021)
Poster presentation judge, graduate student posters at K-State Graduate Research, Arts and Discovery (GRAD) forum (2018)

♦ **Nominated attendee of conference**
Nominated by Texas A&M University-San Antonio's Office of Research and Health Science to represent the university at Food-Energy-Water-Health Nexus Symposium, College Station, TX (2025)

♦ **Faculty advisor**
Biology club, Texas A&M University-San Antonio, San Antonio, TX (2025-26)

♦ **Member of Faculty hiring committee**
Instructional faculty in Chemistry/ Biochemistry, Department of Natural Sciences, Texas A&M University-San Antonio, San Antonio, TX (2025)

♦ **Member of American Society of Plant Biology, Committee**
Women in Plant Biology (2025-2028)

♦ **Science representative for STEM education**
Plant Science Saturday, hosted by American Society of Plant Biologists (ASPB) to offer hands of activities and plant science experiments to engage local families, children and public in the world of plant science, Milwaukee, WI (2025)
Donald Danforth Plant Science Center research representation at Agriculture College and Career Night, Waterloo High School, Waterloo, IL (2022)

♦ **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.

♦ **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).

♦ **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).

Membership:

♦ Botanical Society of Bengal (Life member)
♦ Member of Lipid in Plants: Improving and developing sustainability of crops (Lipids of Crops), NC_temp 1203 (Invited position,2025-current)
♦ 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-current)
♦ American Association for the Advancement of Sciences, AAAS (2009-2010)

Professional development workshop:

♦ 2023 mentee at the Bayer University Mentoring Program