Mahmud Hassan, PhD

Department of Genetics and Plant Breeding | Patuakhali Science and Technology University | Dumki, Patuakhali-8602, Bangladesh | Phone# +8801707006769 | Email: mhassan@pstu.ac.bd
Google Scholar | Linkedin | ORCiD |

EDUCATIONAL QUALIFICATIONS

PhD | Plant Cell and Molecular Biology | The University of Melbourne | Australia	2018
MSc | Plant Genetics and Breeding | Bangladesh Agricultural University | Bangladesh	2010
BSc | Agriculture | Patuakhali Science and Technology University | Bangladesh	2008

RESEARCH AND PROFESSIONAL EXPERIENCES

Professor, Department of Genetics and Plant Breeding, Patuakhali Science and Technology University, Bangladesh	2017-2023
Research Scientist, Molecular Biology, Invaio Sciences Inc, Cambridge, MA, 02138-1127 USA	2022-2023
Postdoctoral Research Associate, Synthetic Biology Group Biosciences Division, Oak Ridge National Laboratory, USA.	2019-2021
Associate Professor, Department of Genetics and Plant Breeding, Patuakhali Science and Technology University, Bangladesh	2017-2023
Tutor, School of Biosciences, University of Melbourne, Australia	2017-2017
Assistant Professor, Department of Genetics and Plant Breeding, Patuakhali Science and Technology University, Bangladesh	2012-2017
Assistant Librarian, Central Library Patuakhali Science and Technology University, Bangladesh	2011-2012
Lecturer, Department of Genetics and Plant Breeding, Patuakhali Science and Technology University, Bangladesh	2017-2023

OTHER PROFESSIONA ACTIVITIES

Manuscript reviewer

- Frontiers in Plant Science
- Frontiers in Genetics
- International Journal of Molecular Sciences
- Frontiers in Ecology and Evolutio
- MDPI (Plants, International Journal of Molecular Sciences)

Editorial Role

- Guest Editor, Sustainability

Membership

- Member, American Society of Plant Biologist
- Member, Global Network of Bangladeshi Biotechnologist
- Member, Bangladesh Association for Plant Tissue Culture and Biotechnology
- Australian Society of Plant Scientists
- Australian Biotechnology Organizations

Media Coverage

- New biosensors shine a light on CRISPR gene editing (December 10, 2021)
  https://www.sciencedaily.com/releases/2021/12/211210102901.htm
  https://phys.org/news/2021-12-biosensors-crispr-gene.html

- New gene stacking method speeds up genetic transformation (June 14, 2023)
  https://www.isaaa.org/kc/cropbiotechupdate/article/default.asp?ID=20231

AWARDS AND HONORS

2022: Best publication award under junior category by Patuakhali Science and Technology University, Bangladesh.

2015: Faculty of Science Abroad Travelling Scholarship, University of Melbourne, Australia.

2015: Botany Foundation Travel Scholarship, Botanical Society of Australia.

2013: Genetics Research Award, University of Melbourne, Australia.

2013: Melbourne International Research Scholarship, University of Melbourne, Australia.

2013: Melbourne International Fee Remission Scholarship, University of Melbourne, Australia.

2011: Chancellor Gold Medal, Patuakhali Science and Technology University, Bangladesh

2009: National Science Information and Communication Technology (NSICT) Fellowship, Ministry of National Science, Information and Communication Technology, Bangladesh.

2008: UGC Merit Scholarship, University Grant's Commission (UGC) of Bangladesh.

FELLOWSHIP AND GRANTS

- Principal Investigator, Identification and characterization of apomictic genes in rice, funded by the University Grant's Commission of Bangladesh, funding amount BDT 150000/year for 1 year.

- Principal Investigator, Genetic variation for nitrogen use efficiency in rice plants, funded by the University Grant's Commission of Bangladesh, funding amount BDT 50000/year for 1 year.

- Co-principal Investigator, Exploring and exploiting of wheat genotypes for heat tolerance, funded by the University Grant's Commission of Bangladesh, funding BDT 50000/ year for 1 year.

PATENTS

- Yang X, Yuan G, Martin S, Hassan M.M., Tuskan GA. “Rapid Assembly of gRNA Arrays” US Provisional Application No. 63/345,460 (Filed date: May 25, 2022)
- Yang X, Yuan G, Lu H, Hassan M.M., Tuskan GA. “Split Selectable Marker Mediated Gene Stacking” US Provisional Application No. 63/408,485 (Filed date: September 21, 2022)

PRESENTATIONS

- Hassan M.M. (Sep 2023) Split-CRISPR to advance the CRISPR/Cas-based genome editing in plants. 5th International Conference on Biotechnology in Health and Agriculture (ICBHA), University of Dhaka, Bangladesh.
- Yuan G., Lu H., Hassan M.M., Yao T., Muchero W., Chen J.G., Yang X. and Tuskan G.A (Feb 2021) Application of Base Editing Technology in Poplar. 2021 DOE Genome Meeting, Washington, USA.
- Vergara M.M., Yuan G., Hassan M.M. et al (June 2020) RNA-based countermeasure against the CRISPR/Cas9 gene-editing tool. ORPA symposium, Oak Ridge, Tennessee, USA.
- Haiwei Lu., Hassan M.M. et al (July 2020) Discovery and functional characterization of poplar mobile proteins involved in plant-fungal communication, Plant Biology 2020, Washington, USA.
- Yang X., Hassan M.M. et al (January 2020) Can Poplar Plants Use Mobile Protein Signals to Influence Mycorrhizal Fungi? International Plant & Animal Genome XXVIII, San Diego, California, USA.
- Yang X., Hassan M.M. et al (February 2020) Experimental characterization of protein movement from plants to ectomycorrhizal fungus, DOE 2020 Genomic Sciences Program (GSP) Annual Principal Investigator (PI) Meeting, Washington, USA.
- Hassan M.M., William A., Tenazas F., Russell D.A., Robin C., and Golz J.F. (2017, March) Development of a germline-specific gene targeting system for Arabidopsis and Brassica species. Poster presented at the 5th Plant Genome and Gene Editing Congress. Amsterdam, Netherland.
- Hassan M.M., Zaw A., & Golz J.F. (2016, October) Improving the efficiency of female germline transformation in Canola. Poster presented at the Brassica2016 conference, Melbourne, Australia.
- Hassan M.M., Zaw A., & Golz J.F. (2015, September) Engineering flower structure for germline transformation of Brassica species. Talk delivered at Combio2015 conference. Melbourne, Australia.

BOOK CHAPTERS

- **Hassan M.M.,** Chowdhury A.K and Islam T. (2021) *In silico* analysis of gRNA secondary structure to predict its efficacy for plant genome editing. CRISPR-Cas Methods. 2: p15-22. Link
- Bhowmik P., **Hassan M.M.,** Uddin K., and Islam T. (2018) Chapter 26: Application of CRISPR-Cas9 genome-editing tool for the improvement of plant abiotic stress tolerance. In Approaches for Enhancing Abiotic Stress Tolerance in Plants. 442-459. CRC Press, Taylor and Francis Group, USA. Link

JOURNAL PUBLICATIONS

- Islam M.T., Liu Y., **Hassan M.M.,** Abraham P.E., Jacobson D., Tsai C.J., Buell C.R., Tuskan G.A. Yang X (2023) Advances in the application of single-cell transcriptomics in plant systems and synthetic biology. *BioDesign Research* (Accepted).

- Khalil M.I., **Hassan M.M.,** Samanta S.C., Chowdhury A.K., Hassan M.Z., Ahmed N.U., Somaddar U., Ghosal S., Robin A.H.K., Nath U.K., Mostafa M.G., Burritt D.J., Van C.V., Gupta A., Tran P.L-S, Saha G. (2023) Unraveling the genetic enigma of rice submergence tolerance: Shedding light on the role of ethylene response factor-encoding gene SUB1A-1. *Plant Physiology and Biochemistry*, 25:206:108224. Link

- Kuntal De, Pal D., Shanks C., Yates T., Feng K, Jawdy S., **Hassan M.M.,** Prabhakar P., Yang JY., Chapla D., Moremen K., Urbanowicz B and Muchero W. (2023) The Plasminogen-Apple-Nematode (PAN) domain suppresses JA/ET defense pathways in plants. *bioRxiV*. Link

- Tannous J., Sawyer C., **Hassan M.M.,** Labbé J.L., Eckert C. (2023) Prospects of CRISPR-Cas9 RNP-Mediated Genome Editing of the Non-Model Plant Pathogen *Sphaerulina musiva*. *Frontiers in Genome Editing.* Link

- Yuan G., Lu H., De K., **Hassan M.M.,** Muchero W., Tuskan G.A., Yang X (2023) Split selectable marker systems utilizing inteins facilitate gene stacking in plants. *Nature Communication Biology* **6**, 567. Link

- **Hassan M.M.,** Martin S., Kai F., Yuan G., Matin M.Z., Muchero W., Griffths N., Weston D. and Yang X. (2023) Genome-wide identification and functional prediction of silicon (Si) transporters in poplar. *Plant Biotechnology Reports*. 17: 285–302 Link

- Liu Y., Guoliang Yuan G., **Hassan M.M.,** Abraham P.E., Mitchell J.M., Jacobson D., Tuskan G.A., Khakhar A., Medford J., Zhao C., Liu C-J., Eckert C.A., Doktycz M.J., Tschaplinski T.J. and Yang X. (2022). Biological and molecular components for genetically engineering biosensors in plants. *BioDesign Research*. Vol 2022, 9863496. Link

- Yuan G. Martin S., **Hassan M.M.,** Tuskan G.A. and Yang X. (2022) PARA: A new platform for the rapid assembly of gRNA arrays for multiplexed CRISPR technologies. *Cells*, 11(16), 2467. Link

- Yuan G., Lu H., De K., **Hassan M.M.,** Liu Y., Muchero W., Li Y., Abraham P.E., Tuskan G.A. and Yang X. (2022) An Intein-Mediated Split–nCas9 System for Base Editing in Plants. *ACS Synthetic. Biology*. 11, 7, 2513–2517. Link

- **Hassan M.M.** Yuan G., Liu Y., Alam M.M., Eckert C.A., Tuskan G.A., Golz J.F. and Yang X. (2022). Precise genome editing in plants using gene targeting and prime editing: existing and emerging strategies. *Biotechnology Journal*. 17(10):e2100673. Link

- Khalil MI, Hossain MR, Chowdhury AK, **Hassan M.M.*** (2022). Characterization of Bangladeshi Aus rice landraces under drought stress. *SABRAO Journal of Breeding and Genetics.* 54(1): 113-126. Link (**Corresponding author**)

- Yang X., Liu D., Lu H., Weston D.J., Chen J-G., Muchero W., Martin S., Liu Y., **Hassan M.M.,** Yuan G., Kalluri U.C., Tschaplinski T.J., Mitchell J. C., Wullschleger, Tuskan G.A. (2021) Biological parts for plant biodesign to enhance land-based carbon dioxide reduction. *BioDesign Research*, vol. 2021, 9798714. Link

- Yuan G., **Hassan M.M.,** Yao T., Lu, H., Vergara M. M., Labbe J. L., Muchero W., Chen J-G., Tuskan G.A., Abraham P.E., and Yang X (2021) Plan-based biosensors for detecting CRISPR-based genome engineering and transcriptional regulation tools. *ACS Synthetic Biology.* 10 (12): 3600–3603. Link

- Yuan G., Lu H., Tang D., **Hassan M.M.,** Li Y., Chen J.G., Tuskan G.A. and Yang X. (2021) Expanding the application of a UV-visible reporter for transient expression and stable transformation in plants. *Horticulture Research* 8, 234. Link

- HU XL., Lu H., **Hassan M.M.,** Zhang J., Yuan G., Abraham P.E., Shrestha H.K., Solis M.I.V., Chen J.G., Tschaplinski T.J., Docktycz M.J., Tuskan G.A., Chen Z.M. and Yang X (2021) Advances and perspectives in discovery and functional analysis of small secreted proteins in plants. *Horticulture Research* 8, 130. Link

- **Hassan M.M.,** Zhang Y., Yuan G., Kuntal De, Muchero W., Chen J.G., Tuskan G.A., Qi Y. and Yang X. (2021) Construct design for CRISPR/Cas-based genome editing in plants. *Trends in Plant Science*. 26, 11, P1133-1152. Link

- Yang X., Medford J.I., Markel K., Shih P., De Paoli H.C., Trinh C.T., McCormick A.J., Ployet R., Hussey S.G., Myburg A.A., Jensen P.E., **Hassan M.M.,** Zhang J., Muchero M., Kalluri U.C., Yin H., Zhuo R., Abraham P., Chen J-G., Weston D., Yang Y., Liu D., Li Y., Labbe J., Yang B., Lee J., Cottingham R.W., Martin S., Lu M., Tschaplinski T.J., Yuan G., Lu H., Ranjan P., Mitchell J., Wullschleger S.D., and Tuskan, G.A. (2020) Plant Biosystems Design Research Roadmap 1.0. *BioDesign Research*, Vol 2020, 8051764. Link

- Yuan G, **Hassan M.M.,** Liu D., Cushman J.C., Lu H., Chen J-G., Tschaplinski T.J., Tuskan G.A., and Yang X. (2020) Biosystem design to accelerate C3 to CAM evolution. *BioDesign Research*, Vol 2020, 9350905. Link

- **Hassan M.M.,** Yuan G., Chen J-G., Tuskan G.A., and Yang X. (2020) Prime editing technology and its prospect for future applications in plant biology research. *BioDesign Research*, Vol 2020: 9350905. Link

- Haque E., Taniguchi H, **Hassan M.M.,** Bhowmik P., Karim M.R., Smiech M., Zhao K., Rahman M., and Islam T. (2018) Application of CRISPR/Cas9 Genome Editing Technology for the Improvement of Crops Cultivated in Tropical Climates: Recent Progress, Prospects, and Challenges. *Frontiers in Plant Science*. 9:617. Link (**equal contribution**).

- Hassan M.N., Haque M.S, **Hassan M.M.,** and Haque M.S. (2014) An efficient protocol for somatic embryogenesis of garlic (Allium sativum L.) using root tip as explant. *Journal of Bangladesh Agricultural University*. 12 (1): 1-6. Link

- **Hassan M.M.,** Shamsuddin A.K.M., Islam M.M., Khatun K. and Halder J. (2012) Analysis of genetic diversity and population structure of some Bangladeshi rice landraces and HYV. *Journal of Scientific Research*. 4 (3): 757-767. Link

- Emon R.M., Gustafson J.P., Nguyen H., Musket T., Jahiruddin M., Islam M.A., Haque M.S., Islam M.M., Begum S.N., and **Hassan M.M. (**2010) Molecular marker-based characterization and genetic diversity of wheat genotypes in relation to born use efficiency. *Indian Journal of Genetics and Plant Breeding*. 70 (4): 339-348. Link

- Jewel A.A., Alam A.K.M.M., Latif M.A., Chowdhury A.K., and **Hassan M.M. (**2010) Multivariate analysis in lentil (Lens culinaris). Bangladesh Journal Plant Breeding and Genetics. 23 (1): 09- 12. Link