



COLLEGE of
BIOLOGICAL SCIENCE

DEPARTMENT OF MOLECULAR
AND CELLULAR BIOLOGY

Announcement:

All interested members of the university community are invited to attend
the Final Oral Examination for the degree of **Master of Science** of

THOMAS KADANTHOTTU KUNJUMON

On Thursday, August 15, 2024 at 1:00 p.m. (SSC 2315)

Thesis Title: AN INVESTIGATION INTO MEMBRANE CONTACT SITES
BETWEEN THE ENDOPLASMIC RETICULUM AND PLASTIDS

Examination Committee:

Dr. Joseph Colasanti, Dept. of Molecular and Cellular Biology (Exam Chair)

Dr. Jaideep Mathur, Dept. of Molecular and Cellular Biology

Dr. Ian Tetlow, Dept. of Molecular and Cellular Biology

Dr. Yang Xu, Dept. of Molecular and Cellular Biology

Advisory Committee:

Dr. Jaideep Mathur (Advisor)

Dr. Ian Tetlow

Dr. Jennifer Geddes-McAlister

Abstract: Direct communication as well as inter-organelle exchanges are facilitated by membrane contact sites (MCS) where organelle membranes encounter close apposition. Among the known plant MCSs, involving major organelles like the plasma membrane, mitochondria and Golgi bodies discovered, the endoplasmic reticulum (ER) often serves as the common interacting organelle. Plastid associated membranes (PLAMs) which includes the ER, features a unique lipidome at plastid-ER interface is hypothesised to accommodate proteins fostering contact sites. Given the extensive lipid flux at this region, lipases, crucial in lipid modifications, likely aid in the lipid exchange at the plastid-ER contact sites. This study uses time-lapse imaging to analyze plastid movement and pleomorphy in transgenics expressing fluorescent fusion proteins targeted to the plastid stroma and ER, along with *Brassica napus* chloroplast lipase protein1 (BnCLIP1), a lipase and other proteins localized to the plastid envelope to demonstrate their role in plastid and stromule behaviour, while also elucidating their functional implications.

Curriculum Vitae: Thomas completed his B.Sc. in Agriculture at the Kerala Agricultural University, India in 2021. He then began his M.Sc. in Molecular and Cellular Biology in Fall 2022 under the supervision of Dr. Jaideep Mathur.

Publications: Mathur, J., **Kunjumon, T. K.**, Mammone, A., & Mathur, N. (2023). Membrane contacts with the endoplasmic reticulum modulate plastid morphology and behaviour. *Frontiers in plant science*, 14, 1293906. <https://doi.org/10.3389/fpls.2023.1293906>

Thomas Kadanthottu Kunjumon, Puja Puspa Ghosh, Laura M J Currie, Jaideep Mathur, Proximity driven plastid-nucleus relationships are facilitated by tandem plastid-ER dynamics, *Journal of Experimental Botany*, 2024; erae313, <https://doi.org/10.1093/jxb/erae313>