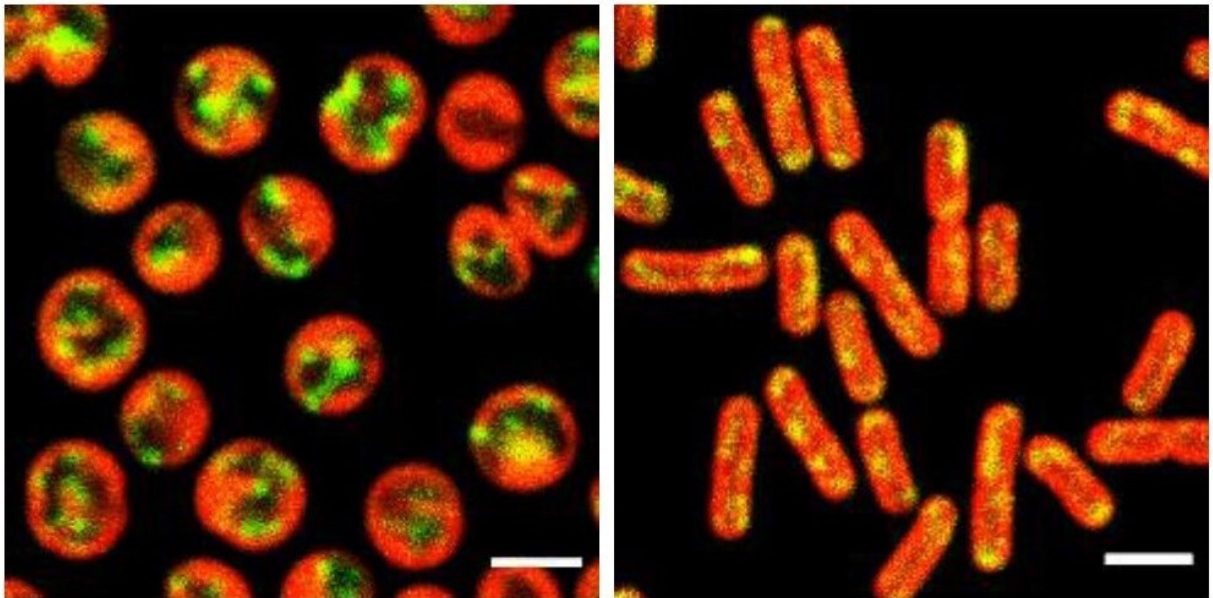


# Researchers discover how messenger RNAs transport information to where photosynthesis takes place

September 8 2020

---



Confocal microscope image of two different cyanobacterial strains: Autofluorescence of the pigments of the thylacoid membrane (red), the signals of mRNAs (green) and the colocalization of both signals (yellow). Credit: Conrad Mullineaux

In photosynthesis, solar energy is converted into chemical energy, which is then used in nature to produce organic molecules from carbon dioxide. In plants, algae and cyanobacteria, the key photosynthesis reactions take place in two complex structures known as photosystems. These are located in a special membrane system, the thylakoids.

However, many details of their molecular structure and the way the proteins are incorporated into the membranes have yet to be explored. A team led by Professor Conrad Mullineaux from the Institute of Biology and Chemistry at Queen Mary University London, UK, Professor Annegret Wilde and Professor Wolfgang Hess from the Institute of Biology III at the University of Freiburg and Professor Satoru Watanabe from the Institute of Biosciences at the Agricultural University of Tokyo, Japan, has published a study in the current issue of *Nature Plants*: The mRNAs are transported to the thylakoid membranes and the respective proteins are produced there on the spot.

The researchers used molecular genetic, bioinformatics and high-resolution microscopic approaches at the single cell level for their investigations. The results confirm that mRNA molecules encode much more than just the sequence of the [protein](#). They also carry signals that appear to control the position and coordination of the photosystem structure. The team was able to identify two proteins likely to be involved in this process by interacting with these mRNAs. The researchers say this opens the way to a detailed understanding of the molecular mechanisms involved and provides new approaches to make these processes useful for photobiotechnology.

**More information:** Moontaha Mahbub et al, mRNA localization, reaction centre biogenesis and thylakoid membrane targeting in cyanobacteria, *Nature Plants* (2020). [DOI: 10.1038/s41477-020-00764-2](https://doi.org/10.1038/s41477-020-00764-2)

Provided by University of Freiburg

Citation: Researchers discover how messenger RNAs transport information to where photosynthesis takes place (2020, September 8) retrieved 21 June 2024 from <https://phys.org/news/2020-09-messenger-rnas-photosynthesis.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.