NREL’s high-throughput screen facilitates the selection of novel H₂-producing algae.

Researchers at the National Renewable Energy Laboratory (NREL) have developed a powerful method for screening through million-member algal libraries for strains with increased hydrogen production.

The screen uses H₂-sensing bacteria that fluoresce when hydrogen is detected and is used as an agar overlay on top of growing algal colonies. The screen was first verified by comparing algal strains that differentially produce H₂ under conditions of high light. Subsequently, the system was used to parse through algal libraries, allowing the selection of a single H₂-producing algal colony out of a field of ~10,000 H₂ non-producers (see figure below). The system is also useful for screening for H₂-producing strains from libraries from natural algal populations.

The long-term objectives of this research are to understand the factors that influence the H₂-producing capability of microalgae and to develop practical algal systems for producing H₂ via photobiological water splitting, with the H₂ harvested directly from the gas phase of the cultures.

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