

OptoBio: conversion of light to transport fuels through integrated optoelectronic cell factories

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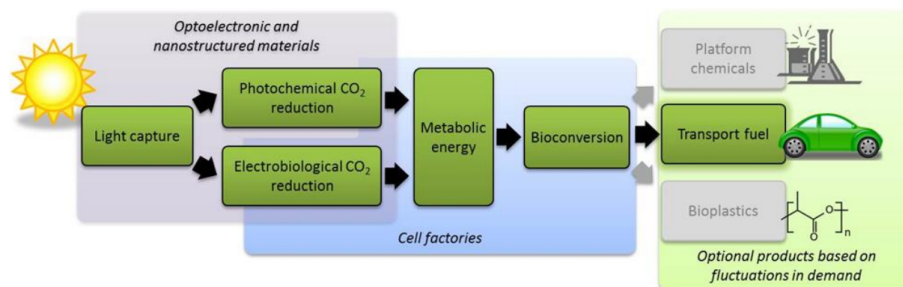
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The aim of the OptoBio project is to increase the efficiency of the conversion from sunlight and CO₂ to specific fuel components by the development and the integration of non-biological and biological systems.

Synthetic optoelectronic systems possess the potential to increase the overall light-harvesting efficiency, by converting light to electricity or hydrogen, by using nanoscale structures as photovoltaic materials, electron guides and for enhancing microbial immobilization, and by photoelectrochemical water splitting, as well as photoelectrochemical reduction of CO₂ to an auxiliary carbon source. The byproducts of the optoelectronic system can be used as a source for the microbial bioconversion in the final fuel components. The major benefit is the possibility to combine all the above innovations into one system.



Nanostructured optoelectronic material systems are being developed by Aalto University, while the electrobiological components are the objective of VTT; the project is funded by the Academy of Finland, Aalto University, and VTT, with the goal to improve the energetic self-sufficiency of Finland as well as to contribute to the technologies devoted to reduce the dependency from fossil fuels.