

Reducing green house gases with cyanobacteria

SciLifeLab, Science for Life Laboratory, is a Swedish research center within molecular biosciences with focus on health and environment. To further strengthen the research environment at SciLifeLab the center regularly recruits young, talented research leaders to become SciLifeLab fellows. Each fellow is recruited by one of the center host universities and receives funding from them.

One of the SciLifeLab fellows is Paul Hudson whose research focuses primarily on metabolism of photosynthetic cyanobacteria. The idea is to manipulate the bacteria to make chemicals and fuels from carbon dioxide, water and light, which are all free abundant resources. Paul's aim is always to link fundamental science with an application.

“Our dream is to create a microorganism that can simultaneously reduce greenhouse gases and produce something of value, like a fuel or chemical that we right now can only get from oil”. Paul said.

SciLifeLab – a national resource

SciLifeLab is a Swedish research center within molecular biosciences with focus on health and environment. It is also a national center with the mission to develop, use and provide advanced technologies. The center infrastructure encompasses a multitude of biomolecular technologies and bioinformatics services. National funding makes SciLifeLab's services and expertise available to researchers in all of Sweden.

The center is a joint effort by four Swedish universities (Karolinska Institutet, KTH Royal Institute of Technology, Stockholm University and Uppsala University). Founded in 2010, the center today encompasses more than 1 200 researchers mainly located in and around the two center nodes in Stockholm and Uppsala.

Paul did his PhD at the University of California, Berkeley, US, and then moved on to a Post Doc position in proteomics at KTH Royal Institute of Technology in Sweden before he applied for the SciLifeLab fellows program.



Photo: Susanna Appel

Paul Hudson

“There was this concept at SciLifeLab of building up expertise in high throughput genomics and systems biology and I thought it would be interesting to apply these new technologies to study and engineer an ancient organism like cyanobacteria. The start up-package offered lots of financial support, which was appealing of course.”

“Right now we are applying systems biology tools to cyanobacteria in a way that I think is only possible at SciLifeLab. Being here has changed our scientific approach to old problems; as a result I have started thinking about cellular processes in a different way. I also get a lot of great input from the other SciLifeLab fellows. For example, I sit next to Vicent Pelechano who is an expert in RNA sequencing techniques. Applying these makes our research unique in the field of metabolic engineering.”

Recently, Paul's group also expanded to study other bacteria, such as those that use hydrogen gas as their energy source. That is very relevant for Sweden because the country has an abundance of sources for hydrogen like the forest industry and hydroelectric power where electricity is used to split water and make hydrogen.

“Sweden is good for me professionally because there are many avenues of support for environmental research. The government and the industry in Sweden are unified in this and are consistent and serious in wanting to reduce greenhouse gases. I can definitely see myself staying in Sweden.”