

Unravelling the evolution of eukaryotes

“The diversity of living things is not just big organisms that you can see, like trees or birds, but most of it is actually single-celled organisms and are important to study to understand how the world came to be.” said Fabien Burki.

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

Fabien did his undergraduate studies and PhD in Geneva, Switzerland. Then he went to Canada for a one year postdoc in Vancouver but ended up staying for nearly seven years before his family decided to go back to Europe and Fabien joined SciLifeLab.

“This fellowship is a great chance because it is good money and really flexible. This is important when you

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.

build your group so you can develop the research that you want. The research environment in Uppsala is also one of the best places in Europe to develop my kind of research.”

Fabien’s group comprises one PhD student and three postdocs at the moment. They mainly use comparative genomics and phylogenomics to reconstruct the evolutionary history of eukaryotes - the eukaryote tree of life - and understand some of the major transitions in eukaryotic evolution like the acquisition of photosynthetic ability.



Fabien Burki

Investigating an unknown phylum

“We are also working on a group of organisms, telonemids, that might be a phylum of their own. They emerged hundreds of million years ago and seem to be unrelated to any other known group. We use transcriptomics and genomics to understand what these cells are, what they do and how they relate to other eukaryotes.”

Another line of research in Fabien’s group is about understanding the diversity, evolution, and host interaction of a poorly known group of micro-eukaryote parasites. This group, *Ascetospora*, includes serious pathogens of oysters and mussels that represent one of the biggest threats to the growing aquaculture industry, yet genome data are almost completely lacking.

“There has been a recent push in Sweden to develop a sustainable aquaculture industry. One of the strongest arguments for developing shellfish aquaculture in Sweden is that coastal waters are free of some of these pathogens, including the nasty *Bonamia* and *Marteilia*. Using state-of-the-art molecular methods, we want to see if this is really the case and look into the genome of these pathogens to develop better diagnostic tools.”