MOLECULAR BIOTECHNOLOGY

Filamentous fungi are the world-champions of protein secretion and loving it! On the flipside, fungi can also cause infections and disease either alone or by interaction with other microorganisms. Research projects available within the group contribute to the development of new technologies for the production of industrially and medically important gene products and understanding protein secretion in the fungal cell factories. Also, understanding the molecular mechanisms underlying fungal pathogenesis is addressed with a view of developing new approaches for treating fungal diseases. In addition to research with fungi, we are exploring the capabilities of a eukaryotic protist in the context of making single cell food in collaboration with an industrial partner.

Our research uses a variety of contemporary molecular technologies applied to eukaryotic microorganisms. We use molecular tools for high level gene expression and knockout studies, and create and analyse genomic and proteomic data to understand cell metabolism, protein secretion and fungal pathogenesis. We make recombinant enzymes for industrial uses and develop synthetic biology methods for microbial strain improvement with a view of making things in a totally new way. This involves internal and external collaboration.

If you are interested in working with eukaryotic microorganisms on the topic areas discussed above, please come and talk to us so we can put together a project according to your interests. Our research organisms are:

- **Trichoderma reesei**
  Industrial producer of recombinant gene products

- **Scedosporium aurantiacum**
  A fungus found in the lungs of patients suffering from cystic fibrosis

- **Euglena gracilis**
  A protist using light for making single cell food
Selected publications


chem.mq.edu.au/academics/hnevalainen.html