Geomicrobiology and metagenomics of deep terrestrial subsurface

Research
We study geobiochemistry and geomicrobial processes in deep terrestrial subsurface environments. Our main interests include bioenergy processes required to maintain life in deep earth crust as well as biotechnological applications of extremophilic microorganisms and their metagenomes.

The main research areas
- Development of methods for sampling of the deep terrestrial biosphere
- Development of molecular biological methods to study the function and diversity of deep microbial communities
- Bioenergy processes such as methanogenesis, hydrogen formation and autotrophic carbon fixation
- Metagenomics of extremophilic microbial communities
- Linking of microbiological data to geochemistry and geophysics

Applications
- Safety assessment of final disposal of radioactive waste
- Bioenergy
- Novel enzymes and bioactive compounds

Collaboration
- Geological Survey of Finland (GTK), Outokumpu Deep Drilling Program
- International Continental Deep Drilling Program (ICDP)
- Institute of Biotechnology, University of Helsinki, Pyrosequencing

Examples on the recent and on-going public research projects:
- Geomol (2006-2010). Geomicrobial processes of deep subsurface – KYT research programme

Contact information
Merja Itävaara, Chief research scientist, merja.itavaara@vtt.fi
Mari Nyysönen, research scientist, mari.nyysonen@vtt.fi
Malin Bomberg, research scientist, malin.bomberg@vtt.fi