

Partners



Contact



Dr. Katrin Pollmann
Helmholtz Institute Freiberg
for Resource Technology at the
Helmholtz-Zentrum Dresden-Rossendorf
Phone +49 351 260 2946
k.pollmann@hzdr.de



Dr. Sabine Kutschke
Helmholtz Institute Freiberg
for Resource Technology at the
Helmholtz-Zentrum Dresden-Rossendorf
Phone +49 351 260 2151
s.kutschke@hzdr.de

Address

Bautzner Landstraße 400
01328 Dresden, Germany

www.hzdr.de/biotechnology

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Innovative Ore Processing by means of Biotechnology



BACKGROUND

Energy Efficient, Environmentally Friendly, Inexpensive

Biotechnological processes are an energy efficient, environmentally friendly, and inexpensive way for extracting and recycling important industry metals and strategic high tech raw materials. They represent a major research focus of the Helmholtz Institute Freiberg for Resource Technology (HIF). Here, methods involving bacteria, other microorganisms, and biomolecules are used to leach metals from the ore (bioleaching) and selectively separate them (biosorption, biomineralization).

Not only are these methods 100 percent biological, but they are also superior to more conventional methods in other respects: Today, metals usually occur in highly complex ores and at very low concentrations. This goes for naturally existing primary resources as much as it does for secondary resources that are found as part of e-waste, for instance. To utilize them, one needs innovative technologies. Biological methods are well suited to increasing both the amount and diversity of usable resources.

HIF scientists are investigating candidate biotechnological methods for extracting and processing metals and rare earths from primary and secondary resources, as well as e-waste.



Bacteria and other microorganisms are capable of metabolically leaching metals from ore bodies.

THE GOAL

Bacteria for Copper Mining: "Ecometals"

Up until now, microbial methods have been used primarily in copper mining. Although in Europe they have not yet established themselves as a means of extracting copper – in spite of the fact that Europe is a major producer of copper from black shale deposits, the second most important source of the metal. The ultimate goals of the HIF-coordinated "Ecometals" research project is to devise technologically feasible methods for leaching copper and other important associated elements from the ore (as well as from the residues of ore mining) and biologically separating copper from the leachates. These methods are intended for global application to different types of copper deposits, and, at the same time, are much more resource efficient and environmentally friendly.

Our Strengths

- // We are looking into innovative, environmentally friendly, and economically viable natural resource technologies which may be used to chart new technological territories for resource processing and recycling. We coordinate and work on projects at both the national and EU level.
- // We have long-standing experience in the study of microorganisms and their interactions with metals and continue to develop this research through to the application stage.
- // Our facilities are equipped with cutting-edge microbiology and molecular biology labs spanning the gamut from culturing microorganisms to biomolecular design to process analysis.

Interested in working with us? Get in touch!