

PRESS RELEASE

BRAIN AG is an industrial alliance partner in German-French "EcoMetals" research programme

Zwingenberg, May 01, 2014 – Biotechnology company BRAIN AG is acting as an industrial partner in the German-French "EcoMetals" research programme planned to last three years. The international project was launched last week at a symposium held at the Helmholtz-Centre Dresden-Rossendorf (HZDR), the leading scientific partner of the project. The Federal Ministry of Education and Research (BMBF) has provided 4.2 million Euros funding for the seven German partners involved in the programme.

High-technology business locations in both Germany and France are highly dependent on metal imports. Most high grade metal deposits in Europe have already been exhausted and those which remain have a relatively low metal content. In many cases they are also too hard to reprocess due to complex mineralisation conditions. An important example is the so-called "Kupferschiefer" (copper shale), whose preparation is of major interest for the programme partners.

There is also a considerable amount of mining waste in Germany e.g in the "Mansfelder Land" and reprocessing this would appear to be profit-

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able from today's perspective, especially as the material is stored in heaps and so is relatively easy to access. New ground must be broken if these economically important, but very complex, raw materials are to be processed in an economically and environmentally sustainable way.

Innovative and sustainable methods for the extraction of copper and other valuable metals from European primary and secondary raw material sources will be developed for practical application as part of the "EcoMetals" research programme. The programme partners are focused on reprocessing copper shale from Poland, as well as copper-rich waste heaps from Germany and the by-products of French mining activities.

BRAIN is actively supporting this programme through both its research and its unique and extensive microbiological strain collection (a BioArchive comprising more than 30,000 organisms) in order to fully develop the new concept of "bioleaching" for eventual application.

Biohydrometallurgical methods, such as the dissolution of metals from the rock matrix using microorganisms (bioleaching), as well as the selective extraction of dissolved metals through bioabsorption or biomineralisation, have been found to be the most promising methods for handling these complex raw materials.

Dr. Yvonne Tiffert, microbiologist and "EcoMetals" project leader at BRAIN explains: "The BRAIN strain collection contains an enormous variety of microorganisms with different metabolic activities. We are confident that this includes numerous suitable candidates that would be able to extract metals from complex minerals even under harsh conditions such as high salt levels, high proportions of organic or inorganic components and even extreme pH values."

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"The programme alliance includes leading German and French experts in both basic research and industrial application in the field of biohydrometallurgy. Here, we have the ideal conditions for developing a practical, scalable process in a short time period that can then be used for the sustainable recovery of economically significant metal raw materials," adds Dr. Guido Meurer, Unit Head Strain Development and member of the executive committee at BRAIN.

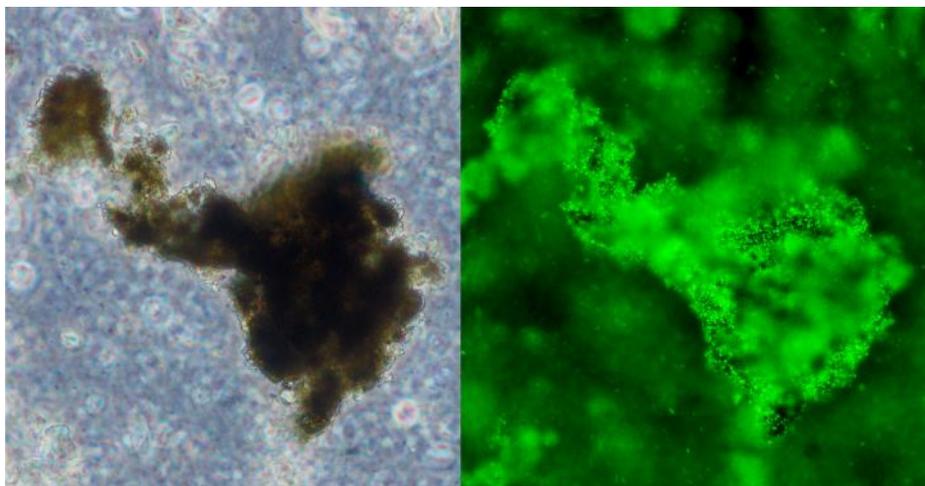
Other programme partners in the international alliance besides BRAIN are Polish mining company KGHM, the German Federal Institute for Geosciences and Natural Resources (BGR), Martin Luther University Halle-Wittenberg, Germany, Freiberg University of Mining and Technology, Germany, the German companies G.E.O.S. mbH, UVR-FIA GmbH, Aurubis AG, as well as the French Bio Intelligence Service, GéoRessources/Nancy, LaTep/Pau (Laboratoire de Thermique, Energétique et Procédés), Air Liquide, Milton Roy Mixing, as well as BRGM in Orléans.

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About BRAIN

BRAIN AG is Europe's leading industrial "white" biotech company and both discovers and develops novel bioactive natural compounds and proprietary enzymes for its partners and customers in the chemical and pharmaceutical industries, as well as the food and cosmetics industries. With its unique approach to the discovery and production of new biological compounds and biocatalysts, the company achieves creative solutions by harnessing nature's untapped biodiversity. Its success is built on its proprietary BioArchive comprising millions of genes, proteins and metabolic pathways from microbial isolates and metagenome libraries. Since its foundation in 1993, BRAIN has entered into over 80 strategic partnerships and alliances with nearly all the relevant companies within the chemical industry, for example BASF, Ciba, Clariant, Evonik, DSM, Genencor, Henkel, Nutrinova, RWE, Sandoz, Schering, Südzucker and Symrise, to name but a few. BRAIN currently employs 114 highly skilled personnel. For their groundbreaking industrial biotechnology activities for a sustainable „biologisation of the chemical industry“ using nature's toolbox for industrial processes, BRAIN and its CEO Dr. Holger Zinke received the "Deutschen Umweltpreis 2008" of the "Deutsche Bundesstiftung Umwelt", DBU.

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Micrograph showing interaction between microorganism and metal ore (200 μm in diameter); left: phase contrast micrograph of an ore sample; right: the same ore sample as on the left but stained with fluorescent vital dye "Syto-9". Living microorganisms are seen as green fluorescent dots adhering to the ore rock. © BRAIN AG archive; reproduction of images permitted when source is indicated.