

PRESS RELEASE

Green Mining

BRAIN AG and CyPlus GmbH develop disruptive technologies for biological processing of precious metal ores

- **Industrially relevant production of precious metals realized on the metric ton scale, even after scale-up of bio-based method**
- **Precious-metal enrichment using microorganisms from the BRAIN BioArchives**
- **Expansion of the CyPlus product portfolio for Green Mining**
- **Market launch of initial products expected in the course of 2019**

The bioeconomy company BRAIN AG and CyPlus GmbH have announced the development of an initial range of market-relevant products for the global mining industry. This work has been carried out as part of a multi-year collaboration between the companies in the area of biological ore processing to extract gold and silver. On the basis of successful laboratory research up to the 100-liter scale, the partners then succeeded in scaling up the process to the metric ton level last October, thus reaching an important milestone in the last stage towards market maturity. The bio-based process could produce the desired precious metals from ores in industrially relevant yields, even for throughputs on the metric ton scale. The method is now being further improved for industrial application and this process is sufficiently advanced for the partners to expect the market launch of the first range of products as early as 2019.

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The extraction of precious metals from the ores is based on the use of naturally occurring and enhanced microorganisms from the BRAIN BioArchives. During the ongoing collaboration, the partners very soon reached the goal of identifying a variety of microorganisms that, having highly specific adhesion effects, give the gold and silver-bearing minerals a new physical property. This effect can be exploited to separate gold or silver specifically from gangue and enrich it in an integrated process step.

“Our research aims at developing bio-based methods that could offer innovative and sustainable processes for green mining in global markets for ore processing,” says Stefan Welbers, Senior Vice President and General Manager of CyPlus GmbH. “For this reason we’ve continuously kept the technical requirements and structural conditions in mines in mind. In the foreseeable future, for example, we’ll be able to offer mine operators the possibility of integrating advanced biotechnological methods into their current processes without significant investment costs or delays in operation. In this way, we’re expanding our technology portfolio to include biological components for efficient and eco-friendly processing of precious metals.”

Dr. Guido Meurer, member of the Management Board and Unit Head Producer Strain Development at BRAIN AG, says: “We’re delighted – and proud – that the BRAIN and CyPlus interdisciplinary team has succeeded in establishing a groundbreaking biological process for a new processing technology and developing it to high product maturity in just a few years. With our processes for Green Mining it will be possible in the future to exploit ore deposits containing precious metals even in regions where the conventional processes are out of the question. Green Mining is an increasingly important issue and an attractive field of business also in view of the increasing scarcity of raw materials.”

The partners have already filed a patent for the bio-based method, which describes the special microorganisms possessing selectively adhesive properties that can be used to enrich precious metals from ores.

Under the mining program, BRAIN is also researching into biological solutions for what is known as Urban Mining, where precious metals are obtained from side streams and waste streams such as slags, ashes, and electronic scrap. The BRAIN BioXtractor (see www.brain-biotech.de/en/bioextractor) has been established as a demo system for this purpose.



Finely ground gold ore for biological processing with Green Mining technologies developed by BRAIN and CyPlus.

Photo: BRAIN AG, Germany

Photo Download via Press Release online: <https://www.brain-biotech.de/en/press/>

About BRAIN

B.R.A.I.N. Biotechnology Research and Information Network AG (BRAIN AG; ISIN DE0005203947 / WKN 520394) is one of Europe's leading technology companies in the field of industrial biotechnology, the core discipline of Bioeconomy. As such, BRAIN identifies previously untapped, efficient enzymes, microbial producer organisms or natural substances from complex biological systems that can be put to industrial use. The innovative solutions and products developed by help of this "Toolbox of Nature" are successfully applied in the chemistry, the cosmetics and the food industries. BRAIN's business model is based on two pillars - BioScience and BioIndustrial. The BioScience segment comprises its frequently exclusive collaboration business with industrial partners. BioIndustrial comprises the development and commercialization of BRAIN's own products and active product components. Further information is available at www.brain-biotech.de/en.

About CyPlus

CyPlus is a globally established company in cyanides. The Evonik subsidiary provides innovative products, technologies and services to customers in the mining, chemical, pharmaceutical, and surface treatment industries. The company meets the extensive and strict requirements of the international mining industry as a supplier of cyanides in accordance with the provisions of the "International Cyanide Management Code" (ICMC). Production sites in Europe as well as sales and distribution offices on all continents provide customers swift and reliable service. CyPlus regards itself as a pacesetter of progress and sustainability. Further information is available at www.cyplus.com.

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