

Press release

Biological gold recycling: BRAIN Biotech AG collaborates with PX Group on the PX Urban Mining Initiative

- **Development of BioXtractor V2 pilot by BRAIN and PX Group and production of first BioGold nuggets from a local waste stream**
- **Extension of cooperation between the two companies as part of the PX Urban Mining Initiative**
- **PX Urban Mining Initiative is a collaborative approach and is open to additional partners with complementary technologies**

ZWINGENBERG, Germany and La Chaux-de-Fonds, Switzerland, 13.02.2025 - BRAIN Biotech AG, leading provider of solutions for the biologization of industry, and the PX Group, expert in the refining of precious metals from various segregated flows, are pleased to announce their collaboration within the framework of the PX Urban Mining Initiative. The extension of the partnership in this initiative stems from the successfully established collaboration between the two companies, which focused on developing a proof of concept for the biological recovery of gold from e-waste and other gold-containing side streams.

The BioXtractor is a container-based mobile pilot plant originally developed by BRAIN Biotech for the biological extraction of metals. The new version BioXtractor V2 was financed by PX Group and is now jointly owned by BRAIN Biotech and PX Group. The container is located at the PX Group's site in La Chaux-de-Fonds, Switzerland, where the gold-containing side streams are gathered and processed. The partners aim to test its performance in a production environment and have refined the BioXtractor plant to the point where the first gold nuggets (BioGold™) were successfully produced from urban waste in 2024.

Dr. Esther Gabor, Head of Microbial Strain development at BRAIN Biotech: “We are very excited about the achievements of the last years. PX Group believed in our technology from day one. Now, that we have successfully scaled up the process to the cubicmeter-scale, we are looking to extend the technology to additional side streams.”

Dr. Alexandra Levesque, Head of Chemical R&D at PX Group: “The BioXtractor perfectly fits in our PX Urban Mining initiative and closes a loop in getting access to BioGold™. Our goal is to integrate the biological extraction process as a key component alongside other technologies to enable the recycling of all materials in e-waste, including copper, plastics, and other metals. The collaboration with BRAIN Biotech has been highly successful, and we look forward to continuing our joint efforts on this important initiative in the future”.

The expanded collaboration between BRAIN Biotech and PX Group is a key part of the PX Urban Mining Initiative, an industry and academic network focused on developing and implementing disruptive, complementary technologies to provide the market with traceable and responsibly sourced urban-mined metals.

BRAIN Biotech is contributing its proprietary bioleaching technology as the core technology for recovering of BioGold™. The PX Urban Mining Initiative is open to additional partners who wish to contribute complementary technologies, drive a proximity approach and induce a change of culture in the industry.

More recycled gold recovery through biological process

Approximately 4000 tons of gold are consumed worldwide each year. Approximately 67% of this gold is still extracted from primary ores. With declining ore grades and rising exploration costs, as well as negative environmental impacts, this approach is increasingly being questioned and is economically vulnerable.

Most existing e-waste recycling processes are under environmental scrutiny because they rely on energy-intensive smelting processes that emit large amounts of greenhouse gases. With rising energy and CO₂ costs, smelting for recycling is not a viable long-term option for the future. For this reason, BRAIN Biotech developed the microbial bioleaching process for the recovery of precious metals at its Zwingenberg site to bring it to pilot scale together with an industrial partner.

The BioXtractor was intentionally designed and constructed as a mobile unit, allowing the biological extraction process to be tested directly at potential application sites and integrated into existing process chains. Its installation at PX Group's industrial site in Switzerland now serves as the foundation for validating and further developing the process at a pilot scale.

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Pictures for the press:



Picture left: *The BioXtractor V2 at the PX Group site in La Chaux-de-Fonds, Switzerland. Copyright: PX Group*

Picture right: *The first gold nuggets (BioGold™) produced from municipal waste as early as 2024. Copyright: PX Group*

About PX Group

Founded in 1976 by Pierre-Olivier Chave, PX Group has grown into a key player in the metallurgy sector. With approximately 600 employees across its companies in Switzerland (PX Précimet and PX Précinox) and Malaysia (Swiss Profile), the Group embodies Swiss precision and expertise, placing itself as a leader in precision metallurgy in the last two decades. PX Group continues to push the boundaries of what's possible, providing tailored solutions, elevating industry standards and meeting customer expectations. With a commitment to precision and excellence, the company plays across a diverse range of industries,

including medical, dental, luxury goods, watchmaking, jewellery, and various other niche markets. The aeronautics, banking, automotive and high-tech industries also benefit from company's unique expertise.

The Group's activities are focused on the manufacture of semi-finished products such as profiles, tubes and rings, in both precious and non-precious metals, via rolling, drawing and punching operations. The group also offers hard metal machining solutions for shaped, standard and threading tools. Last but not least, one of the pillars of our expertise lies in our mastery of alloy production and our gold recycling and refining capabilities. To constantly improve customer satisfaction, the Group funds its own research and development department to create new alloys and sustainable processes. The department also develops national and international partnerships, encouraging innovation and research. Committed to human and environmental values, the company supports the development of alternative and renewable energies. Thanks to its PX Impact® label, the Group has developed its own responsible gold supply chain, guaranteeing not only the traceability of ethical gold – from extraction to processing in Switzerland – but also contributing to a real improvement in the living conditions of local mining communities. The Group is committed to responsible gold production and works on a daily basis to reduce its environmental footprint, by implementing measures to support artisanal mines in abandoning the use of mercury in their gold extraction.

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BRAIN Biotech Group

The BRAIN Biotech Group is a leading company in the research, development and production of specialty enzymes with a focus on the food and life science industries. In addition, the Group develops microbial production organisms and scalable bioprocesses for the economic production of specialty enzymes and other proteins. Customized innovative biological solutions for more sustainable products and processes round off the portfolio.

The parent company of the BRAIN Biotech Group is BRAIN Biotech AG. The business activities of the integrated company are divided into the two segments BRAINBiocatalysts (development, production and distribution of specialty enzymes, microorganisms, ingredients) and BRAINBioIncubator (research-intensive development projects, pharmaceuticals). For production, the Group operates fermentation plants in the UK as well as production facilities in continental Europe and the USA.

BRAIN Biotech has been listed on the Frankfurt Stock Exchange since February 9, 2016 (Ticker: BNN; ISIN DE0005203947 / WKN 520394). The company employs around 325 people at several locations and generated revenues of EUR 54.6 million in the 2023/24 financial year. Further information can be found at: www.brain-biotech-group.com.

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Disclaimer

This press release contains forward-looking statements. These statements reflect the current views, expectations and assumptions of the management of BRAIN Biotech AG and are based on information currently available to management.

Forward-looking statements do not guarantee the occurrence of future results and developments and are subject to known and unknown risks and uncertainties. The actual future results of BRAIN Biotech AG and the BRAIN Biotech Group and developments concerning BRAIN Biotech AG and the BRAIN Biotech Group may therefore differ materially from the expectations and assumptions expressed herein due to various factors. These factors include, in particular, changes in the general economic situation and the competitive situation. In addition, developments on the financial markets and exchange rate fluctuations as well as national and international legislative changes, particularly regarding tax regulations, and other factors may have an influence on the future results and developments of BRAIN Biotech AG.

BRAIN Biotech AG assumes no obligation to update the statements contained in this release.