The Compostable Bioprocess

If life science would be a country, it would rank third in plastic waste production, and 5th in CO_2 emission. We need to become more sustainable in terms of energy and plastic use. Sterilization before, and inactivation after use requires vast amounts of energy and water, while single use plastics are from petrochemical plastic and are incinerated after use. The concept of a circular life science and bioprocess, including composting can make a disruptive change and ensure that life science research and biomanufacturing comply with circular bioeconomy concepts.

BACKGROUND
Material streams from biotechnology are often sterilized by temperature or chemicals, before and/or after use, which relies on vast amounts of energy, water and is straining waste-water treatment. Additionally, single-use plastics used in life science are non-bio-sourced and end up being incinerated because they are not biodegradable. These waste-streams can be substantially reduced by a simple, easy-to-implement, and low-energy green solution: **Composting**.

TECHNOLOGY
The concept includes **composting the biomass** used for biotechnological production (CHO, HEK, Vero, Yeast, etc.) after any secondary products, e.g. proteins, have been extracted, ensuring degradation of residual DNA as demonstrated for transgenic plants. Poly-lactic-acid can be used as a **biodegradable** building material for bioreactors and other equipment as we have previously shown. The added benefit is: 3D-printing can be developed to sterilize the material during the printing process avoiding sterilization in an R&D context. Accordingly, energy consumption can be reduced by >90% and the entire single-use bioprocesses can be set up in a bio-sourced and biodegradable manner, complying with the requirements of a circular economy.

OFFER
We are searching for partners from biopharma, biotechnology and composting facilities. **Be the first one to demonstrate a compostable bioprocess** and the first one to **show a real circular bioprocess** meeting the national and international sustainability goals of 2040 and beyond.

acib-EXPERTS:
Priv.Doz. Peter Satzer, PhD
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AVAILABLE FOR:
• Joint Research Project
• Contract Research
• Funding calls (e.g. FFG-COMET, FFG-Bridge, EU-projects)

DEVELOPMENT STATUS:
Technology Readiness Level 2
(Technological concept formulated)

IPR:
Will be generated for you as our industrial partner

KEYWORDS:
Compostable
Bioprocess
(Bio)Plastics
Biopharmaceuticals
Sustainability
Carbon-Neutral
Upstream
Downstream

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