

Implications of Emerging Biotechnologies for Bioreactor Materials



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The need for this study arose from a discussion early on in the Network between EBNet academic and industry members about the implications of emerging industrial and environmental biotechnologies for producers and users of industrial bioreactors.

This topic is relevant both to EBNet's Anaerobic Fermentation (AF) WG and to the Bioelectrochemical Systems (BES) WG because of the relevance of Microbially-Induced Corrosion (MIC) in this context. Further discussions led to a joint-funded PhD and an extensive desk-based study, carried out by postdoctoral researcher Maria Ramos Suarez in conjunction with experts from industry and the University of Southampton. The full report covers multiple scenarios and consists of 40 pages incorporating 217 references.

Report

The report examines major emerging bioproduction processes in industrial and environmental biotech, based on the top 10 bio-based products - as selected by market size and research importance. It looks both at the conditions likely to occur during production and their significance for different bioreactor materials. Finally, it also looks briefly at the ranges of conditions likely to be in use as a result of extremophile exploitation, and at the significance of MIC.

As few studies have performed immersion tests of metal and polymer specimens within a bioreactor environment, and the information on corrosion and abrasion mechanisms is still limited, it is timely to identify any areas of inadequacy in the light of such emerging processes & conditions. The IB sector is expanding rapidly, necessitating such advancements in bioreactor materials to withstand corrosion and wear.

The full report is currently embargoed whilst a journal paper is in preparation but, once the paper is published, the report will be made freely available on the EBNet website.

Top 10 bio-based products
Biomethane
Biohydrogen
Bioethanol
Biobutanol
Lactic acid
Volatile fatty Acids (VFA)
Succinic acid
Biosurfactants
Polyhydroxyalkanoates (PHA)
Enzymes

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AF WG <https://ebnet.ac.uk/wg-details/wg-af>

BES WG <https://ebnet.ac.uk/wg-details/wg-bes>

For further information on outputs from this activity see Resources. <https://ebnet.ac.uk/resources>

IMPLICATIONS OF EMERGING BIOTECH FOR BIOREACTOR MATERIALS

