

INSIDE THE CSIR BIOMANUFACTURING INDUSTRY DEVELOPMENT CENTRE - BIDC









OVERVIEW

The CSIR Biomanufacturing Industry Development Centre (BIDC) is a world-class facility established to translate biotechnology-based concepts into market-ready products and services. The facility offers competency throughout the value chain, from laboratory-scale concept validation through to technology prototyping and pilot manufacture.

OUR OBJECTIVES ARE TO

- Stimulate the growth of a biomanufacturing-based economy and create sustainable jobs in a new industry value-chain
- Support Small, Medium and Micro Enterprises (SMMEs) to develop bio-based manufacturing processes and products that meet customer requirements within short time frames to exploit existing market opportunities
- Partner with existing industry to co-develop products and technologies
- Assist R&D institutes to translate their research into products and services

The facility comprises laboratories for molecular biology, applied chemistry, biocatalysis, natural products chemistry, process chemistry, food technology, as well as laboratory-scale process development. These facilities are complemented by high-end analytical infrastructure and skills within the CSIR.

OUR PRODUCT FOCUS AREAS

The BIDC focuses on industrial biologics (e.g. biological water treatment and sanitation solutions, enzymes, whole-cell biocatalysts, research reagents); products for human and animal health care (e.g. vaccines, diagnostics, probiotics).

BIOPROCESSING, AGROPROCESSING CAPABILITIES AND INFRASTRUCTURE INCLUDE

UPSTREAM (USP) AND DOWNSTREAM (DSP) BIOPROCESS TECHNOLOGY DEVELOPMENT The team has significant expertise and a proven track record in the development of:

- Complete inoculum trains and fermentation processes at scales ranging from 500ml to 1000L using bacterial, yeast, fungal, plant and algal systems
- Agroprocessing capabilities from microliter to 400 Litre scale
- Extraction and formulation of natural ingredients for cosmeceuticals, nutraceuticals, food and the complimentary medicines sector
- Protein purification capabilities from microliter to multi-litre scale.
- High-end analytical capabilities Mass spectrometry, NMR

The team also has expertise and a track record in a wide range of process options for DSP development. These range from crude cell separation via centrifugation or filtration to more complex chromatographic purification, solvent extraction and various drying process options.



Product development

Biological product development is complicated due to the sensitive nature of organisms, extracts or products produced. The group is able to transform sensitive product intermediates into saleable final products with improved shelf stability using the various process options available.

Process validation

Process validation is critical to successful technology transfer for scalable manufacture. Here the team focuses on demonstrating reproducibility across the entire process while ensuring the necessary quality control measures and systems are in place.

• Technology packaging and transfer

All technical information is packaged into a series of reports that inform the final process. These provide inputs into the development of a process model that allows for the demonstration of efficiencies/non-efficiencies across the process. The technology package further contains detailed standard operating procedures and raw material certificates of analysis that allows for easy technology transfer.



• Techno-economic assessment and evaluation The process model presents a detailed account of performance across all process unit operations. This allows the team to prepare a detailed cost of production for each product. In addition, process flow sheet and factory/plant layout is prepared, which contains detailed information of the equipment and utilities required. This allows the team to do techno-economic assessment of the business with projected cash flows and resultant Internal Rate of Return (IRR) and Net

Agile product development

Present Values (NPVs).

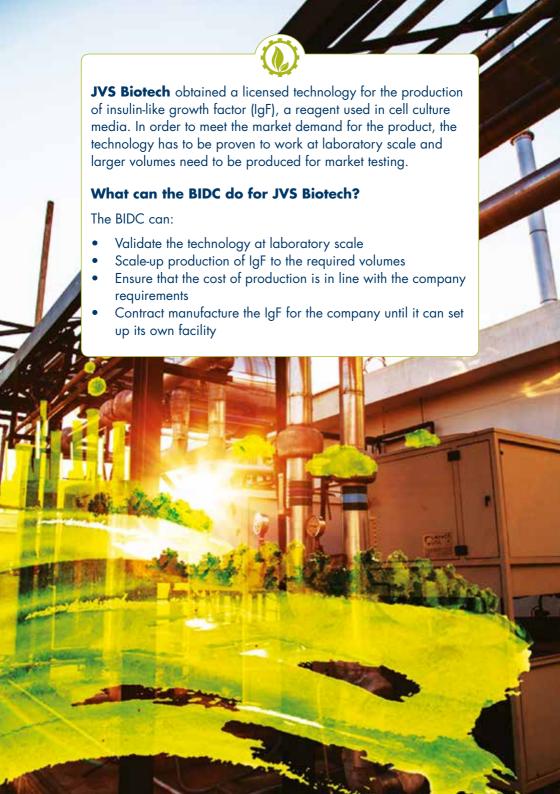
Agile product development allows the team to rapidly develop products based on platform technologies that exist with the group. Time frames from lead to final product can range from as little as 3 months to about a year. Prototypes for market testing are produced throughout this process.

Support of emerging enterprises and existing industry

The BIDC is accessible to the regional system of innovation and can provide contract R&D, process development, process optimisation, scale-up, regulatory support, commercial manufacturing services, incubation of SMMEs and codevelopment of products and technologies with existing industry to enable the development of a vibrant and sustainable bioeconomy in Africa.









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