

Biomanufacturing Definition 101

1. WHAT IS BIOMANUFACTURING?

Biomanufacturing is the use of biological mechanisms to i) synthesize products ii) act as tools or iii) undertake processes, at a scale required for commercial use.

Biomanufacturing can use different sources for the desired biological mechanisms:

- Animal and human cells;
- Plants, either individual cells or whole plants;
- Micro-organisms such as yeast, bacteria, fungi, and microalgae;
- Viruses.

Biomanufacturing can either use biological processes to synthesize desired products, or the biological material is the product itself.

2. WHAT ARE DIFFERENT TYPES OF BIOMANUFACTURING?

- Immunotherapy, where human cells are a biomanufactured **product**, having been modified to target cancer using the patient's own immune system.
- Food ingredients including alternative proteins and other ingredients such as vitamins can be synthesized by microorganisms through a biomanufacturing **process** commonly referred as fermentation.
- Viral vectors are a biomanufactured **tool** where viruses are adapted to deliver genes into cells for use in gene therapies or in vaccine manufacture.

3. HOW DOES BIOMANUFACTURING PLAY A ROLE IN OUR LIVES?

Biomanufacturing is applicable across many sectors, helping to create products and processes that are part of our everyday life, including medical therapies, food and animal feed ingredients, fuels, textiles, plastics, cosmetics, detergents, and intermediates for other manufacturing processes.

This all contributes to the bioeconomy, which is recognised as economic activity linked to life sciences.

4. WHY IS BIOMANUFACTURING IMPORTANT?

Biomanufacturing is increasingly used around the world, as scientists and engineers are able to achieve reliable and consistent manufacture at higher scales and with increasing complexity and efficiency.

The primary drivers behind the growth of biomanufacturing include:

- Creating novel products that were not previously available: Advanced therapies and vaccines are examples, allowing previously untreatable or incurable diseases to be addressed.
- Transforming current manufacturing: Biomanufacturing processes can create products using reduced energy, resources and requirement for fossil fuels, fewer petrochemical products, simplifying processes, plus reducing demands on biodiversity through replacing the need for natural extraction.