

Industrial Biotechnology



Industrial (or white) biotechnology commonly involves the application of biological resources to traditional industrial processes, leading to the manufacture of products such as fuels, food and feed, paper, plastics and fine chemicals. Innovation in industrial biotechnology has followed the first wave of biotechnology innovation in the health sector but can now be recognised as a body of developing and developed technologies with growing markets.

The advantages of industrial biotechnology include the ability to reach new products, or achieve the production of known products more efficiently, often using readily available bulk feedstocks.

Using biological resources, such as enzymes and microorganisms, a wide range of end products may be produced. Examples include small molecule compounds via fermentation processes, polymers produced using cereal sources, and cellulose materials produced from wood-based substrates.

Unlike biotechnological innovation within healthcare and agriculture, biological resources used in industrial biotechnology are generally not intended to interact with other species or with the environment outside the reactor. As such, many of the ethical concerns surrounding biotechnology innovations in healthcare and agriculture do not apply to industrial biotechnology.

Patent claims for industrial biotechnology inventions can, in principle, be directed to fermentation media including the biological resource; bio reactors as a whole; new process steps; potentially the products produced; and in appropriate cases, newly identified and newly genetically modified microorganisms which affect the desired transformation.

Patent claims towards non-biological compounds, compositions, reaction mediums, reaction apparatus and chemical processes have a long history in European patent law, and globally. Many patentability issues surrounding such components have already been addressed and are therefore well understood.

Nevertheless, the unique problems that biotechnology raises can still be found when protecting innovations in industrial biotechnology. In particular, great care is needed when preparing patent applications in this field to ensure that the conventional legal requirements of sufficiency and inventive step can be satisfied. In some cases, biological materials will need to be deposited with authorised depository institutions – see AL Factsheet [Biological deposits](#) for more information - and sequence listings may need to be prepared – see AL Factsheet [Sequence listings](#). It is normal for patent applicants to seek broad claims, but patent offices are alive to the issue of whether inventions can be applied across the whole of the scope claimed. It is important that sufficient data is made available to provide support across as much of the scope breadth as is feasible.

An example of a patent application relating to industrial biotechnology is [WO 2015/022496](#) which is directed toward a process for producing methacrylic acid using a step which involves the production of mesaconic, citraconic or citramalic acid in a microorganism. Another example is [EP1753869B1](#) which claims a process for producing polylactic acid (PLA) from fermentation of renewable agricultural feed-stocks by *Lactobacillus* species.

We have explained the general principles of protecting inventions in the field of industrial biotechnology in this AL Factsheet but it is only an introduction, and any live situation will need individual assessment. Please contact us if you need more detailed information.