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Research & Development

White Biotechnology

White biotechnology at BASF – Ludwigshafen



White biotechnology is a key technology in BASF. It has the potential to manufacture products more efficiently than with conventional chemical processes. It is also useful for enabling completely new products not accessible using conventional synthesis approaches.

BASF uses the biotechnological methods of fermentation and biocatalysis in order to manufacture products such as vitamins, enzymes and chiral chemicals.

(01) Molecular biology lab

30/05/2016; 05:08; A1/A2: direct sound; FullHD



In the research lab for white biotechnology, the microorganisms are grown on agarose plates. Under sterile conditions, they are isolated and are analyzed and optimized with molecular biological methods.

Later these strains will be cultivated in the bioreactor. These techniques enable the microorganisms to produce enzymes at large scale. Enzymes are proteins that act as catalysts to enable or accelerate biological and chemical processes.

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(02) DNA-electrophoresis

30/05/2016; 03:18; A1/A2: direct sound; FullHD



Gelelectrophoresis is an important analytical method in biotechnological research. With gelelectrophoresis, DNA can be made “visible”. Scientists in white biotechnology research in BASF use this method to check if the desired genes have been transferred to the microorganisms.

These microorganisms will later be cultivated in a bioreactor to produce enzymes – first in the lab and later at a technical scale.

(03) Fermentation lab

30/05/2016; 04:14; A1/A2: direct sound; FullHD



BASF scientists cultivate microorganisms to produce enzymes, for example Phytase, which is used for animal nutrition products.

For the fermentation process which takes place inside the bioreactor, the microorganisms are provided with oxygen, the right substrate solutions and optimal temperatures. Periodically samples are drawn from the bioreactor, which are analyzed further.

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(04) Conserving resources with microorganisms

30/05/2016; 05:06; A1/A2: direct sound; FullHD



In white or industrial biotechnology, BASF investigates methods and processes for efficient and resource-conserving manufacture of chemical and biochemical products.

With it, BASF uses natural synthesis to manufacture products which cannot or not competitively be produced through conventional chemical methods and reactions. The centers of research for white biotechnology are Ludwigshafen, Germany, as well as Tarrytown and San Diego, California.

(05) Large-scale fermenter in the pilot plant

21/09/2016; 08:37; A1/A2: direct sound; FullHD



Monitoring of the progress of fermentation in a 5000-liter fermenter in the biotech pilot plant.

The biotech pilot plant is equipped with a large number of pilot-scale reactors complete with process control system for the active further development and optimization of existing processes and the development of new large-scale fermentation processes.