Research No. 7

Basic studies in Biotechnology

This line of research comprises basic studies relevant to key areas in the generation of biotechnologies. In many cases, these studies have resulted from the Center's need to develop its own specific technologies. Nevertheless, the programs and projects tend to develop areas of research with more general objectives.

Programs

7.1 Fermentation technology.

7.2 Enzyme technology.

7.3 Downstream processing.

7.4 Perspective studies in biotechnology.

Program 7.1 Fermentation technology.

The primary goal of this program is the development of technology to obtain a product of interest in the areas of food and health. Various types of microbial cultures are used. Our study focuses on the engineering parameters which affect a fermentation process, emphasizing the mass and heat transfer phenomena (fermentation engineering), the scale up criteria and the optimization of production processes. This optimization is done from an operative unit up to the integral process. Finally, we study the control of the process through the development of equipment and control strategies.

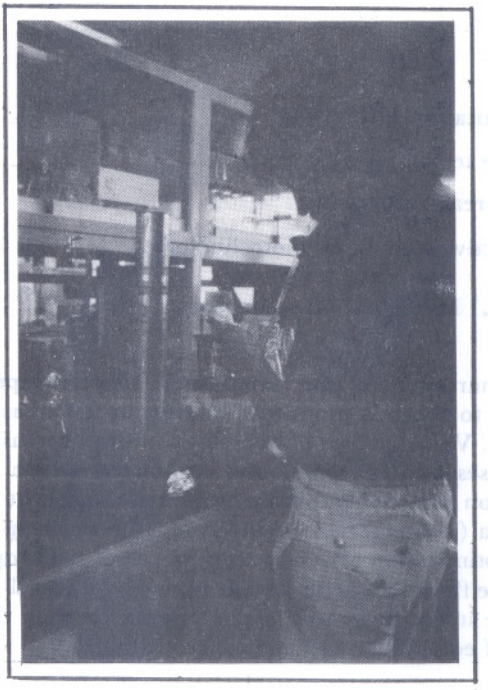
Specific projects

Projects directed towards the study of fermentation engineering;

Basis of engineering and scale up conditions in the production of xanthan gum.
B. Torrestiana, E. Brito, G. Delgado, R. Herrera, R.M. Corona and E. Galindo
1985/P/A/E/DBT/UEPP

Influence of superficial oxygen transfer on total transference.
A. Martínez and M. Salvador
1986/I/DBT/UEPP

Distribution of impellers and their influence in oxygen transfer in bioreactors.
A. Martínez and M. Salvador
1986/I/DBT/UEPP



Projects directed towards the study of optimization processes:

The influence of nitrogen sources in the production of single cell protein from milk whey.
M. García and M. Salvador
1986/T/W/C/DS T/UEPP

The influence of oxigen tension in the production of enzymes.
L. Pedraza, R. Mojica, S. Sánchzz and M. Salvador
1986/T/S/DBT/UEPP

The production of ethanol and its recovery during yeast fermentation.
M. Salvador
1986/ I/A/DBT/UEPP

Antibiotic production in plug flow columns: perspectives and modeling.
M.R. Celis and M. Salvador
1986/I/S/DBT/UEPP

Selection of scale up criteria in the production process of 6-APA.
L. Pedraza, M.E. Rodríguez, F. Neri and M. Salvador
1986/I/S/DBT/UEPP

Analysis of carbon source requirements in a feebback culture for the production of Beta-galactosidase in *Kluviveromyces fragilis* cells.
J. Torres, A. López and L. Casas
1985/T/P/S/DBT/UEPP

Projects directed to the study of scale up processes:

Relation of the oxygen transfer coefficient (Kla) on the production of Beta-galactosidase in *K. fragilis*.
J. Torres, A. López and L. Casas
1985/T/A/S/DBT/UEPP

Projects directed towards the designs of equipment:

Design and characterization of biosensors to measure compounds of clinical and industrial interest.
J. García, J. Pimentel, M. Alvarez and E. Galindo
1983/P/A/S/DBT

Program 7.2 Enzyme technology.

The aim of this program is to utilize the specific activity of an enzyme to procure a less expensive conversion. The enzymes can be used either in a purified form or contained in free or immobilized cells. To accomplish our goal, we carry on studies on the following: kinetic characterization of the enzyme of interest; development of new supports for the immobilization of the biocatalysts obtained and design and characterization of biocatalysts applied to enzymatic reactors.

Specific projects

Projects directed towards the kinetic characterization of enzymes;

Kinetic characterization of the Beta-galactosidase from *E. coli and K. fragilis.*
L. García, M. García, A. Canales, R. Quintero, A. López, E. Castillo, C. Peña and L. Casas
1983/P/A/S/DBT

Projects directed to the development and characterization of enzyme and cell supports:

Development and characterization of enzyme supports derived from galactans, galactomanans and polyoles.
F. Domínguez, E. Brito and L. Casas
1984/T/A/DBT

Characterization of various supports derived from cellulose acetate.
E. Castillo and L. Casas
1985/P/A/S/DBT

Projects directed towards development and characterization of biocatalysts:

Immobilization and characterization of a biocatalyst with Beta-galactosidase activity from *K. fragilis* cells immovilized in cellulose acetate fibers.
M. García, E. Castillo, A. López and L. Casas
1983/P/A/DBT

Development of an immobilization method for proteins in nylon.
J. García and E. Galindo
1983/P/A/S/DBT

Utilization of immobilized enzymes in the generation of hydrogen peroxide for milk conservation.
A. Luna, M. García and L. Casas
1986/P/A/DBT

Projects directed to the study and application of enzymatic reactors:

Design and characterization of an enzymatic reactor for the hydrolysis of lactose.
E. Castillo, L. Casas and A. López
1985/P/A/S/DBT/UEPP

Program 7.3 Downstream processing.

The aim of this program is to develop recovery processes suitable for the types of biotechnological applications on which the Center's research lines are focused.

Specific projects

Research studies on the recovery purification of xantan from a fermentation broth.
M.E. Ramírez, R. González, J. Torres, F. García, E. Brito and E. Galindo
1985/P/A/E/DBT/UEPP

Yeast recovery with Beta-galactosidase activity and without zimase activity from a fermentation broth.
C. Peña, J. Torres and L. Casas
1985/P/A/S/DBT/UEPP

Extraction and purification of the Beta-galactosidase from yeast.
S. Méndez, M. González and L. Casas
1985/P/A/S/DBT/UEPP

Studies on the recovery of single cell protein from fermented broths.
M. Salvador
1986/T/A/DBT/UEPP

Program 7.4 Prospective studies in biotechnology.

Through this program we inform researchers on the development of those projects which have potential for commercial applications. The specific areas we will cover include: technological policy, project evaluation, and industrial application.

Specific projects

Diagnostic kits: technological and market analysis.
E. Galindo
1986/I/S/DBT