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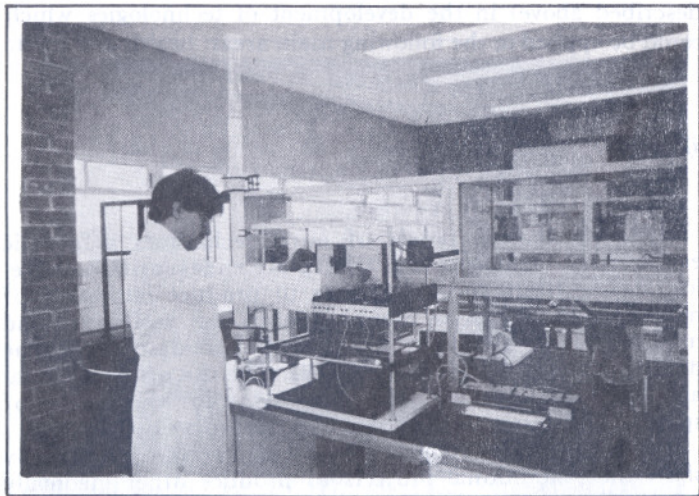
## Objetives

1. To gain basic knowledge in Biology within the Center's areas of competence.

2. To construct the framework needed for the basic knowledge that will help generate biotechnologies.

3. To encourage the establishment of a link between the University and the private sector through mechanisms that foster the use of biotechnologies.

4. To participate in the decentralization of research and higher education and in the training of specialized staff.



### Areas of Research

#### 1. *Basic Research.*

The Center conducts basic research that will help generate understanding in the following areas:

i) Molecular Biology of Nucleic Acids (organization, control and manipulation of specific regions of the genome, genetic engineering, DNA replication and chemical synthesis of DNA).

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ii) Biochemistry of proteins and peptides (development of purification methods for proteins and peptides; biochemistry, molecular biology and physiology of neuropeptides, isolation of antigens and production of antibodies; characterization of venom, from poisonous animals).

iii) Genetic microbiology and genetic improvement of -- strains from organisms of basic and industrial interest (*E.coli*, *X. campestris*, *K. lactis*, *S. thyphi*, *S. Streptomyces* sp., *Pseudomonas* sp., etc.).

iv) Fermentation, scaling up and bioengineering of processes (development of biological techniques at a level of pilot plant, basic studies on fermentation, kinetics, separation, etc.

v) Enzymatic engineering (development of a basic methodology in the use of immobilized enzymes in different reactors).

## 2. Applied Research.

It is our objective to utilize existing knowledge as well as new information generated through basic research (in the areas described above) in the development of technologies which could be applied to the following main areas: health and food.

### i) Health

By exploiting the power of novel techniques in genetic engineering, the scientists at CIIGB are endeavoring to develop strains from microorganisms to produce molecules of medical interest such as, human insulin, over production and modification of antibiotics, like penicillin amidase, and in the design of microbiological electrodes. The use of monoclonal antibodies and specific DNA fragments for the design of specific diagnostic systems, are also been developed.

There is the possibility of initiating, within a relatively short time, additional projects to produce other medically relevant peptides such as, a specific antiserum against viral, parasites, and enterobacteria antigens. Another aspect of the work being carried out is the characterization and fractionation of venoms from poisonous animals and insects.

### ii) Food

Scientists at CIIGB work on different areas of unconventional food such as: production of unicellular protein

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from methanol and milk serum. An additional line of research applies enzymatic engineering to the food industry. There is on going work on designing systems of immobilized enzymes which are relevant to the food industry, such as lactase.

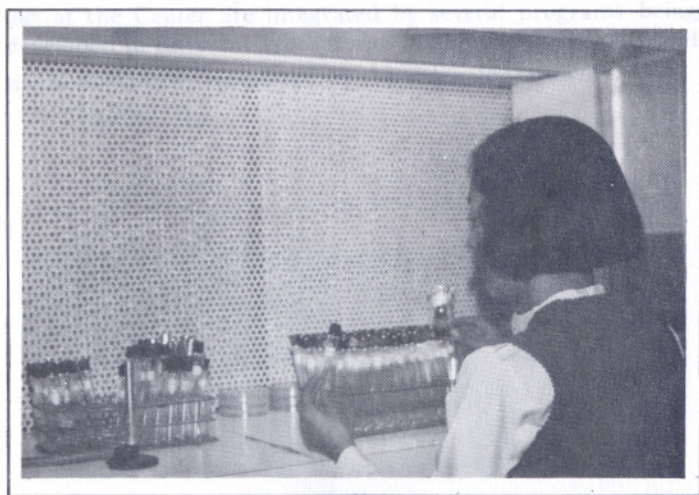
In the area of microbiological electrodes, technologies to immobilize viable cells and enzymes in different supports, have been developed.

Electrode prototypes, which detect glucose and lactose and which also determine the biochemical demand of oxygen and the concentration of antibiotics, have been designed.

Another dimension of the research being done is the production of other types of biomolecules of interest to the oil and food industries such as the polysaccharide xantan.

### *3. Teaching and Development of Human Resources*

The academic staff actively participates in the formation of students who are attending the School of Science and Human



nities of the UNAM and who are enrolled in one of the two following programs: bachelor, master and doctorate in Biomedical Research and specialization, master and doctorate in Biotechnology.

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Finally, the academic staff and students have organized a serie of ongoing conferences in the areas of Molecular Biology and Medicine which take place at the Medical School of the Universidad Autónoma del Estado de Morelos (UAEM).