

Center for Genetic Engineering and Biotechnology

COMPANY PROFILE



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Company profile

The Center for Genetic Engineering and Biotechnology (CIGB) was founded on the 1st. July 1986 in Havana, Cuba, by then President Commander in Chief Fidel Castro Ruz.

Later, in 1989 at CIGB headquarters was founded in the province of Camagüey and in 1990 another headquarters was founded in the province of Sancti Spíritus.

The CIGB is subordinate to the Superior Organization of Business Management BioCubaFarma.

- **Industry:** Biotechnology and Drug Manufacturers
- **Sector:** Healthcare
- **Type:** Public Company
- **Founded:** 1986
- **Headquarters:** Playa, La Habana
- **Company size:** ≈ 1600 employees



Mission and Vision

We have the challenge of achieving innovative products with high added value that generate a positive impact on human, animal and plant health, as well as industrial productions, in harmony with the environment, to contribute to the socioeconomic development of Cuba.

Mission

Our mission is to research, develop, produce and commercialize novel biotechnological and pharmaceutical products, with a positive impact on human, animal and plant health, and on industrial productions, in harmony with the environment. Contribute to the socioeconomic development of Cuba.

Vision

Our vision is to maintain leadership as one of the companies with the greatest scientific-technical contribution to health, and to achieve a solid international position with biotechnological innovation, in harmony with the environment, for sustainable socioeconomic development.



Our values

Our values

Our company encourages and strengthens values shared by the majority of workers, which contribute to a motivational, innovative and participatory climate, and favor the quality of work, productivity and competitiveness, in order to solve health and nutrition problems that plague Cuba and the world:

- Loyalty to the principles of the Revolution
- Responsibility
- Professionalism
- Ethics
- Commitment
- Discipline
- Quality
- Consecration
- Sense of belonging
- Initiative
- Creativity
- Humanism
- Excellence

We are a productive scientific complex

We develop vaccines, drugs and diagnostics for human, animals and plants.

COVID-19 vaccines and products

Novel and traditional that are used in Cuban treatment protocols for COVID-19, such as the Abdala vaccine. Cuba deploys mass vaccination of its population with its own vaccines.

Food sustainability

The food sustainability of the nation is prioritized through own scientific solutions that raise productive performance.

Main processes

Research

We cover biomedical, agricultural, preclinical and clinical research.

Biomedical Research

Our basic and applied biomedical research, with a high component of innovation, allows us to obtain and develop biotechnological and pharmaceutical products, with added and competitive value, aimed at solving health problems, aimed at cancer therapy, inflammation, infectious, cardiovascular, neurodegenerative and autoimmune diseases, as well as healing and cytoprotection, taking into account environmental sustainability. For this we have the departments of Vaccines, Pharmaceuticals, Systems Biology, Chemistry-Physics, and Control of Scientific-Technical Activity.

Agricultural Research

Our agricultural biotechnological research responds to the need to increase agricultural and livestock production in Cuba, for the sustainable satisfaction of the food demands of the

Cuban population and the decrease in food imports. They are aimed at obtaining vaccines, veterinary drugs, bioproducts, improved crops applicable to agriculture and intensive crops and obtaining industrial enzymes, aware of our responsibility with human safety and protection of the environment.

Preclinical Research and Animal Experimentation

We are responsible for the design and development of the preclinical programs of the different products developed at the Center for Genetic Engineering and Biotechnology, and we are in charge of guaranteeing the use and care of laboratory animals to support research, biotechnological development and control of product quality, under the supervision of the Institutional Committee for the Use and Care of Laboratory Animals (CICUAL/CIGB).

We are governed by national and international regulations, and we comply with the ethical principles related to the use of laboratory animals and quality requirements, through good

Main processes

preclinical practices and good practices of the medical-pharmaceutical industry, applied to the use of laboratory animals. All these processes are supported by a documentary system that includes a program for the use of the laboratory animal in the CIGB, an environmental monitoring program, and duly approved operational procedures for all activities, which constitute powerful tools to guarantee repeatable, reliable results and insurance.

According to the sanitary hygiene status, our animals are kept in barrier areas (with controlled conditions), which have high-tech equipment, with a rigorous automated control of the environmental parameters of temperature, relative humidity and differential pressure. . Our scientific staff and specialists are highly qualified, have more than 15 years of experience, and are trained in different subjects of biological sciences and laboratory animal science, such as animal reproduction, toxicology, pharmacology, histopathology, environmental safety, bioethics. and immunology.

Clinical Research

Our clinical investigations are in charge of coordinating, designing, controlling the execution and termination of clinical studies and pharmacovigilance with pharmaceutical products, with the aim of obtaining health records in Cuba and other countries, to offer new therapeutic alternatives for diseases that constitute health problems and guarantee the subsequent commercial activity. We aspire to maintain excellence, the spirit of advancement and leadership in clinical research activity, to continue to achieve the highest quality standards, with satisfactory results to insert our products in the most demanding markets.



Main processes

Technological Development

We develop bioproducts using genetic engineering and biotechnology techniques, and we work on the continuous improvement of the products marketed by the Center for Genetic Engineering and Biotechnology. The technological development process includes the establishment of technologies in laboratories, with all the required quality parameters, governed by an integrated project management methodology, which guarantees adequate planning of the objectives and a systematic review of their progress. To do this, we combine good manufacturing practices (GMP) and good laboratory practices (GLP) and maintain a documented quality system that provides the highest quality and safety of the products and technologies that we are developing. Among the activities we carry out are:

- Development and optimization of fermentation processes.
- Production of pilot batches
- Reengineering of existing fermentation processes.
- Process integration for improvements of productivity.
- Modeling and simulation of downstream processes.
- Optimization and analysis of experiments using the QbD methodology.
- Methods of cell disruption of microorganisms.
- Methods for primary purification, including precipitation and liquid-liquid extraction.
- Preventive and therapeutic development of combined vaccines.
- Pegylation of biomolecules.
- Encapsulation in microspheres of proteins and peptides.
- Establishment of analytical methodology for the stability of intermediate studies and final products.
- Development of technological packages for technology transfer, request for approval of clinical trials and registration of new products.
- Assurance of compliance use of good laboratory and production practices during technology development and pilot batch production.

Main processes

Production

We design, produce, control and ensure the quality of our biopharmaceutical products and vaccines for the Cuban health system and for export to other countries. Our core business is the manufacture of active pharmaceutical ingredients (APIs) for the manufacture of vaccines, interferons and growth factors. We obtain antibodies that are used in the elaboration of diagnostic means and products for the treatment and improvement of animals and agricultural crops. We also take care of the activities of packaging and conditioning of finished products, and we participate in the transfer of technologies and incorporate new products from the research and development areas. For all this, we have production facilities, designed in accordance with current pharmaceutical industry standards and in harmony with international regulations on good manufacturing practices.

Our line of pharmaceutical productions, with principles of synthetic proteins and peptides, is used in the preparation of preventive vaccines for hepatitis B and influenza (flu); in the production of thrombolytics; in obtaining recombinant

human epidermal growth factor with healing activity (in injectable and topical formulation) for the treatment of diabetic foot ulcers and burns; as well as in the manufacture of alpha and gamma interferons (formulated individually or in combination) for the treatment of hepatitis, cancers, rheumatoid arthritis and COVID-19. We also produce blood products, such as transfer factor, with immunological activity.

Commercialization

We market a wide range of vaccines, biopharmaceuticals, disease diagnostic tests for the biomedical, agricultural and industrial sectors. We guarantee the export of goods and the positioning of our products in the target markets. We work in the variety of the exportable offer of Cuba. We maintain strict control of our products in the markets to which we are accessing. We diversify sales among various foreign markets and clients. To our clients in the world, we provide high-tech products that guarantee a higher quality of life for people.

Research Areas

Biomedicine

We research and development of vaccines and biopharmaceuticals for the diagnosis, treatment and prevention of diseases.

Research lines

- Vaccines
- Cancer
- Diabetes and scarring
- Cytoprotection
- Infectious diseases
- Bacterial diseases
- Autoimmune diseases
- Cardiovascular diseases
- Neurodegenerative diseases
- Ophthalmological diseases
- Dermatological diseases
- Hematological diseases
- Neurological diseases
- Gastrointestinal diseases
- Inflammation
- Fibrosis

Animal Biotechnology

Research and development of biomolecules, vaccines and diagnostics to veterinary medicine and aquatic organisms, through the use of molecular biology, genetic engineering and biotechnology.

Research lines

- Vaccines against ectoparasites
- Diagnosis of haemoparasites
- Vaccines against classical and African swine pests
- Diagnosis of classical and African swine pests
- Vaccines against brucellosis
- Diagnosis of brucellosis
- Expression in mammalian cells
- Products for application in aquatic organisms.

Research Areas

Plant biotechnology

Genetic transformation of plants and development of diagnostic systems for the control of pests and phytopathogens. Design and production of enzymes for industrial use.

- Functional genomics of plants
- Use of plant defensive system elicitors
- Plants as heterologous protein expression systems

Research lines

- Genetic improvement of corn
- Genetic improvement of soy
- Genetic improvement of sugarcane
- Bean genetic improvement
- Development of molecules for the protection of citrus fruits against Huanglongbing (HLB)
- Development of bioproducts, such as Hebernem, a bionematicide
- Plants as bioreactors
- Development of diagnostic systems for phytopathogens
- Diagnosis of plant pathogens and diseases
- Design and production of enzymes for industrial use through biotechnological processes
- Functional genomics of plants
- Use of plant defensive system elicitors
- Plants as heterologous protein expression systems

Industrial Enzymes

Agricultural biotechnology is also applied to the design of industrial enzymes.

We have designed the biotechnological industrial enzyme technology, with impact on the quality and production of sugar and its derivatives (dextranasa and invertasa), which has been transferred to the Cuban Institute for Research on Sugar Cane Derivatives (ICIDCA) of Grupo Azucarero AZCUBA.

With the enzyme Kestozyme (fructosyltransferase) produced by the CIGB, the Grupo Azucarero AZCUBA will produce tens of tons of fructooligosaccharides (FOS) in 2021, a prebiotic for functional food for humans and animals.

Research Areas

The production of the phytase enzyme is currently underway for its industrial production in Cuba, which will allow the use of monogastric animals in the plants, which will make it possible to replace imports and improve the conversion of food with the consequent increase in production.



Board of directors



PhD. Marta Ayala Ávila
General director



PhD. Jorge Valdés Hernández
Deputy Director General



PhD. Yassel Ramos
Deputy director



PhD. Enrique Pérez Cruz
**Director of CIGB
Sancti Spiritus**



PhD. Nemesio González
**Director of CIGB
Camagüey**



PhD. Gerardo Guillén Nieto
**Director of Biomedical
Research**

Board of directors



PhD. Mario Pablo Estrada
Director of Agricultural



PhD. Jorge Castro Velazco
**Director of Preclinical
Research and Animal
Experimentation**



PhD. Verena Muzio González
**Director of Clinical
Research**



PhD. Odalys Ruiz Hernández
**Director of Technological
Development**



MSc. Lourdes Costa Anguiano
**Director of Quality
Control**



Ing. Jorge Luis Vega Elias
Director of Production

Board of directors



Ing. Miriela Gil Mena
Director of International Sales



PhD. Rolando Páez Meireles
Director of Business Development



MSc. Yai Cruz Ruiseco
Director of Imports

Our COVID-19 vaccines and products



Abdala

First vaccine against COVID-19 in Latin America.



Mambisa

Anti-COVID-19 vaccine candidate, nasal application.



Nasalferon

Interferon alfa 2b for nasal application for the prophylaxis of SARS-CoV-2 virus infection.



Jusvinza

To control hyperinflammation, regulate the immune response y reduce the risk of mortality.

Our products



Heberon® Alfa R

Antiviral, antiproliferative and immunomodulatory.



HeberFERON®

Combination of interferon 2b and gamma for basal cell carcinoma.



Heberprot-P®

The only therapy in the world for the effective healing of diabetic foot ulcers.



PEG-Heberon®

Drug containing interferon alpha 2b for chronic hepatitis B and C.

Our products



Hebervital®

Drug containing granulocyte colony stimulating factor (GCSF or Filgrastim).



HeberNasvac®

Therapeutic vaccine against chronic hepatitis B virus infection and its consequences.



Proctokinasa®

Suppository containing recombinant streptokinase for acute hemorrhoidal disease.



Hebertrans®

Contains transfer factor to treat cellular immunodeficiency, cancer, and other diseases.

Our products



Heberkinasa®

Recombinant streptokinase for lysis of intracoronary thrombi and prevent ischemic necrosis of the myocardium.

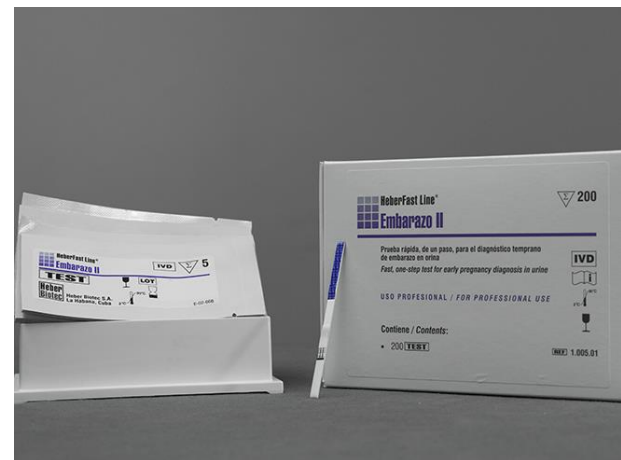


Hebermin®

Antimicrobial and bacteriostatic cream with rEGF for healing, burns, bedsores and surgeries.



HeberFast Line® MaterniTest II
Test for early pregnancy diagnosis.



HeberFast Line® Embarazo II
Test for early pregnancy diagnosis.

Vaccines and others products



HeberFast Line® anti-transglutaminasa

Test for early diagnosis of celiac disease.



Quimi-Hib®

Drug containing granulocyte colony stimulating factor (GCSF or Filgrastim).



Heberbiovac HB®

Recombinant vaccine against hepatitis B virus and its consequences.



Heberpenta®-L

Pentavalent liquid vaccine, which contains antigens against five diseases.

Our products



Acuabio V®

Nutritive supplement and stimulator of the innate immunity of aquaculture organisms of commercial interest.



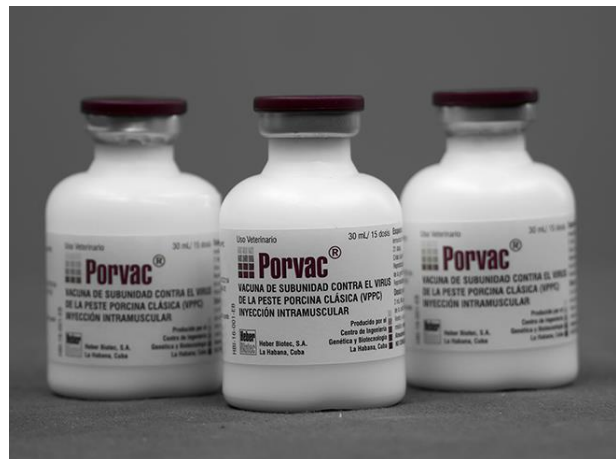
HeberNem®

Biological product to control of nematodes of different species and genera.



Gavac®

Immunogen against the Rhipicephalus (Boophilus) microplus tick of cattle.



Porvac®

Protein subunit vaccine against classical swine fever virus.



Center for Genetic Engineering and Biotechnology

Distinctive company of Cuban biotechnology which develops, produces, markets and exports innovative products, for key areas of the biomedical, veterinary, agricultural, aquaculture and industrial sectors, for one health. It has a portfolio of research and development (R&D) projects and products, protected by patents. Its more than 30 products marketed in more than 35 countries, include first and only drugs of its kind, to treat diseases that do not have other effective therapeutic solutions. Several of its medicines are inserted into national programs to offer comprehensive health care. We work with social responsibility and in harmony with the environment.

AVCIGB CENTRO
DE INGENIERÍA GENÉTICA
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