

# *Cuba: A Nation of Scientists*

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On January 15, 1960, then Prime Minister of the Revolutionary Government Fidel Castro stated: "The future of our country has to be necessarily a future of men and women of science."

The prophetic statement was made when the island still had an illiteracy rate of over 20%, when there were few research centers, the exodus of professionals was beginning, and the number of professors and teachers was far from able to support this aim, which many considered unachievable.

The path then to achieving the ambitious goal, announced by Fidel, began to be outlined in the heat of the 1961 Literacy Campaign. In 1962, the National Commission of the Academy of Sciences was created.

On the initiative of the late leader, Cuba took its first steps into biotechnology in the early 1980s, at the same time developed countries began to develop the sector.

Among the first institutions created in the country to foster the progress of different areas of knowledge were the Center for Agricultural and Livestock Health, the Center for Neuroscience, the Immunoassay Center and the Center for Genetic Engineering and Biotechnology.

For a poor and blockaded country, investing considerable resources in scientific research was undoubtedly an unusual event.

Officially open in Havana by leader Fidel Castro on July 1st, 1986, the Center for Genetic Engineering and Biotechnology has contributed exceptionally to place Cuba among the world leaders in such an important sector, recognized as such by prestigious academics and specialized publications in the US

and around the world.

The Immunoassay Center was officially opened on September 7, 1987, to foster the design and production of technologies and strategies aimed at the massive research of various diseases. The institution has the capacity to develop the teams, means of diagnosis, and software it uses, as well as to provide technical assistance to all its clients in all services provides.

The Molecular Immunology Center is yet another jewel of Cuban science, whose most recent achievement was the design and development of CIMAVAX --a therapeutic vaccine against advanced lung cancer. The Immunology Center operates 325 laboratories throughout Cuba in addition to 469 laboratories in Latin America and 11 others in China. Up until September 2015, the center had obtained more than 300 patents abroad and nearly 200 were being processed.

It's worth noting though that the Center for Genetic Engineering and Biotechnology, the Immunoassay Center and the Molecular Immunology Center are just three of many other Cuban scientific research institutions attached to the Biotechnological and Pharmaceutical Industries Business Group, known as Biocubafarma, which was created on the initiative of late leader Fidel on December 7th, 2012. Biocubafarma is the result of the merger of two Cuban industries with more than 30 years of accumulated experience --the biotechnological and pharmaceutical industries.

Unlike other companies of its kind worldwide, Biocubafarma exhibits a 'distinctive feature'. It deals with the whole process of human life, from preconception to chronic, non-communicable diseases that are commonly associated with aging.

Another main feature is that it operates under the closed-cycle system, which means that it is in charge of commercializing all the products, technologies and services that the biotechnological and pharmaceutical industries have to offer.

Besides the economic contribution generated by exporting to 36 countries, the products created by Cuba's BioCubaFarma Group have the great value of contributing to the prevention and treatment of 26 diseases in Cuba.

The iconic institution also contributes products that are unique in the world. That is the case of the recombinant anti-hepatitis B vaccine (Heberbiovac B), registered in over 30 countries in Latin America, Asia and Europe, whose introduction in the national health system has enabled eradicating this severe disease among Cuban children under 5 years of age.

Its use has also significantly reduced the incidence of the disease on the general population, given that all young Cubans under 25 years old have been immunized against hepatitis B. The use of this product has been endorsed by the World Health Organization (WHO) since 2001.

The Cuban medication Heberprot-P for the treatment of diabetic foot ulcers is also unique. Registered in more than 20 countries, the injectable drug accelerates the healing of complex advanced-state wounds and ulcers in the lower limbs of diabetic patients, thus significantly reducing the risk of amputation. Over 70,000 patients around the globe have benefited from the use of Cuba's Heberprot-P medication.

Although the pharmaceutical and biotechnology industries are undoubtedly the most recognizable faces of Cuban science in the world, due to the development of cutting-edge technologies and products, Cuba is recognized also for its health cooperation programs with other nations and peoples of the world.

The arrival of the first Cuban medical brigade in Algeria in 1967 marked the beginning of what is now a long tradition of solidarity cooperation that has seen Cuban health professionals traveling around the globe to assist patients in mostly poor, under-served regions or in areas, anywhere in the world, devastated by either natural disaster or serious epidemics.

Another flag-ship program of Cuba's health cooperation with other countries, the Latin American School of Medicine (ELAM), was established on Fidel's initiative.

ELAM was first conceived from an idea by leader Fidel Castro, as part of Cuba's humanitarian and development aid response to the devastation caused by Hurricane Georges and Hurricane Mitch in 1998, which affected several countries in Central America and the Caribbean, including Cuba. In all more than 11,000 people died in the resulting floods and mudslides. In response 500 full medical scholarships per year for the next decade were offered by the Cuban government to students from four countries — the Dominican Republic, Haiti, Honduras and Nicaragua — seriously affected by the hurricanes.

Officially inaugurated in 1999, up until 2015 ELAM has graduated more than 39 thousand health professionals from 150 countries, mainly from poor communities in Latin America and the Caribbean as well as Africa and Asia.

ELAM's mission is to train competent and cooperative health professionals with the degree of MD (doctor of medicine), the same degree which is offered to medical graduates all over the Americas. The Cuban medical training model also emphasizes primary healthcare, community medicine and hands-on internship experiences. Once graduated, the young professionals return to offer their services to people in their own communities.

On January 15, 1960, then prime minister of the Revolutionary Government Fidel Castro, said that Cuba's future would necessarily have to be a future of men and women of science.

Half a century later the future envisioned by the late leader of the Cuban Revolution is now a tangible reality. Cuba is a country of researchers, specialists and highly skilled workers, boasting one of the world's most important bio-pharmaceutical industries, with achievements comparable to those of leading nations in this field of knowledge.

With his proverbial optimism, Fidel taught Cuban researchers to overcome major obstacles and never give up on realizing even the most Utopian of dreams.

Science is undoubtedly one the most important achievements of the Cuban Revolution and has had a vital impact on health care – not just in Cuba, but also in many countries around the world.

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