

Cuban socialism advances biotechnology

written by Gregory E. Williams
May 15, 2023



In Havana, our delegation visited the Centro de Ingeniería Genética y Biotecnología de Cuba - in English, the Center for Genetic Engineering and Biotechnology in Cuba. SLL photo

Twentieth anniversary of the Human Genome Project

April was the 20th anniversary of the official completion of the Human Genome Project (HGP). This was an international collaboration to identify all the DNA sequences comprising the human genome.

Planning for this colossal effort began as far back as 1984. The execution took 13 years, from 1990 to 2003. In actuality, the identification of nucleotide base pairs making up the genome was only 92% complete in 2003, when the project was declared completed. It was not until 2021 that the genome was sequenced, with only 0.3% of base pairs remaining undetermined.

The achievement by 2003 was astonishing. Countless hours of human labor combined with advances in computing power resulted in a nearly complete picture of the human genome only 50 years after the DNA structure was determined. The project was driven primarily by public collaboration - not market forces - with a relatively free exchange of information. Researchers worked in some 20 institutions in six countries, including China.

Since 2003, major milestones have been reached. For example, as of March this year, a Mississippi woman named Victoria Gray is experiencing a complete cessation of all symptoms of sickle cell anemia, a painful disease mainly affecting Black people. She began receiving experimental gene therapy using CRISPR technology in 2019. This would not have been possible without the HGP and other recent advances in genetics.

Advances hampered by the profit motive

The full potential of these and other scientific advances is hampered by the profit motive inherent in the capitalist mode of production. Consider that recombinant human insulin has been on the market since 1982, yet 1.3 million diabetic people in the U.S. rationed insulin in 2021; the Biden administration has moved to bring down prices, but, again, this is 41 years after the product became available.

In a period marked by anti-intellectualism, academic and even journalistic information remains behind paywalls. On the other hand, disinformation - as with the far right's anti-vaccine propaganda - is often free.

And on top of the more "normal" limitations placed upon scientific development are imperialist blockades and sanctions. The anti-imperialist movement should be clear that sanctions are war by other means. The blockade of Cuba is designed to put maximum pressure on the population to force regime change, benefitting foreign capitalists. It is designed to hurt common people, especially children and older people. The Cuban government estimates that as of spring 2022, they have lost more than \$150 billion because of the blockade. That is \$150 billion that could have gone toward health care, housing, or combatting climate change. It could have gone toward improving infrastructure to withstand the frequent hurricanes that batter the island.

Cuba develops biotechnology industry

Cuba is known around the world for its medical professionals. Cuban nurses and doctors go where there is need, to any country where they can travel. But Cuba is also distinguishing itself with world-class biotechnology research and manufacturing.

In Havana, our delegation visited the Centro de Ingeniería Genética y Biotecnología de Cuba - in English, the Center for Genetic Engineering and Biotechnology in Cuba, established in 1986. Multiple staff were gracious enough to take a couple of hours out of their workday to explain the history of this industry in Cuba, detailing achievements made despite seemingly impossible conditions imposed by the blockade. This demonstrates how seriously they take internationalist solidarity. As with everywhere else we went, the staff emphasized the importance they give to interchange with people from the U.S.

This institution had humble beginnings when, in 1980, Fidel Castro met with U.S. oncologist Dr. Randolph Lee Clark and others to discuss the promise of interferons and other cutting-edge medicines. Fidel had a grand vision for this industry in Cuba. He understood how it could improve people's lives, developing alongside the free, comprehensive health care system.

Today, this sector can manufacture over 70% of the medicines used on the island. This strengthens the resilience and sovereignty of the national economy and assures access for the population. Since 2012, the biotechnology industry has been grouped principally under the state-owned BioCubaFarma, uniting multiple pre-existing entities. According to the presentation we saw, BioCubaFarma has 996 products on the national market, with 76% relating to public health.

By prioritizing this sector and integrating it with on-the-ground health care through socialist planning, Cuba has radically decreased the incidence of infectious diseases. The entire population up to 40 years old has been immunized against Hepatitis B, which kills up to 1 million people worldwide each year. As of 2021, Cuba has fewer than 100 cases of acute Hepatitis B. No cases have been reported for people 15 years old and younger.

This is just one example. Cuba is also on track to eliminate meningitis.

BioCubaFarma has produced a recombinant human epidermal growth factor - a drug called Heberprot-P - which improves healing of advanced diabetic foot ulcers. Around the world, patients with diabetic foot ulcers have a mortality rate of almost 50% within five years, making this condition a significant public health concern, including in the U.S.

To date, this industry has produced five vaccines against COVID-19, with Cuba's Abdala being the first COVID-19 vaccine developed in Latin America. Abdala has a 92.28% efficacy at three doses. Importantly, these vaccines do not require special

refrigeration, making them suitable for wide distribution in the developing world.

In all, the presenter explained the development and impact of around 13 different biotechnology products. All of these are the result of heroic efforts in the face of the blockade. He was clear that the full development of the sector is impossible so long as the blockade is in place. As a worker in a U.S. molecular biology lab, this writer knows that all of the materials and equipment needed to carry out even the most basic research in these areas are expensive. It is difficult for laboratories in Cuba to replace non-functioning equipment or to obtain chemical reagents. He described these difficulties as “a continual nightmare.”

For these reasons, biotechnology development is held back. This harms the Cuban people, who are deprived of income and more rapid scientific development. But it also harms people worldwide who could benefit from access to Cuba’s products. That includes people in the U.S., especially the working class and oppressed.

For the free exchange of information

The Human Genome Project showed that great advances in knowledge and technical ability are possible with international collaboration and a free exchange of information. That project itself was nearly thwarted by forces representing a different vision - one which saw genetic therapies and even genes as exploitable for profit. This is emblematic of science under capitalism. Fortunately, the public project won out. But in general, the existence of capitalism and imperialism thwart the full flowering of human potential, including scientific advancement.

Cuba’s scientific achievements under present circumstances are enormous. BioCubaFarma does have collaborative projects in some countries, including China and Spain. But without the blockade, much more would be possible. Imagine if researchers from Cuba and the United States could work together without this interference. Imagine how much poor and oppressed people in the U.S. would

benefit from Cuban medicines and aid from their incredible medical professionals. Imagine the benefit to Cuba if its products were widely available in the U.S.

The working class in the U.S. has no interest in continuing the blockade. For us - as for the working class in Cuba - it is a detriment. What will benefit us, again, is the free exchange of knowledge and expertise. What will benefit us is internationalist collaboration.

