



Cuba in the time of coronavirus: exploiting a global crisis Part III. Interferon, Cuba's so-called "wonder drug" for COVID-19

by Maria C. Werlau

A drug produced by Cuba, the human recombinant interferon alpha 2b, has been hyped since early March 2020 in media reports, blogs, and social media posts all over the world as the "most effective" treatment or "the cure" for the new coronavirus product. Many glowing reports convey a misleading idea that the drug was "developed in Cuba" or "created" by its biotechnicians.¹ In fact, the drug has long been produced by numerous laboratories² and companies around the world and Cuba's version was developed in the 1980s thanks to generous contributions by scientists and institutions from the United States, Finland, and other countries. Cuba's product, generically known as IFNrec and marketed as is marketed as Heberon Alfa R, is merely "one of the 30 products chosen by the Chinese National Health Commission to treat the covid-19."³ Assuming it is safe and of the highest quality —unverified propositions— it is most likely just a cheaper product thanks to much lower production costs.

The drug was developed by Cuba's Center for Genetic Engineering and Biotechnology (CIGB), which is part of the Cuban state's biotechnology and pharmaceutical conglomerate, *BioCubaFarma*. The corporate conglomerate develops, manufactures, and commercializes human and veterinary vaccines, therapeutic molecules, peptides, monoclonal antibodies, diagnostic systems, functional foods, and aquaculture products⁴ through 34 companies and institutes that commercialize 300 products exported, until recently, to 43 countries.⁵ Currently produced by Cuba in partnership with China, the coronavirus pandemic has greatly helped expand and diversify the customer base.

Cuba's biotechnology industry was born in Texas!⁶

Cuba's entirely state-owned biotechnology industry originated from a November 1980 visit to Havana by oncologist Randolph Lee Clark, M.D. (1906-1994), of Houston's M.D. Anderson Hospital, considered the

¹ "Cuba solidaria ante propagación del coronavirus en el mundo," op. cit.

² Merck & Co., for instance, produces a similar product Intron A. (Enrique Torres, "Verdades y mitos sobre el medicamento cubano para tratar la covid-19," *Periodismo de Barrio*, Mar 20, 2020, <https://tinyurl.com/uyjidde4>.)

³ "Interferón alfa 2B: El medicamento cubano usado en China," *Granma*, Feb. 6, 2020; E. Torres, op. cit.) (The article cites Carlos Pereira, Cuba's ambassador to China.) Vinay, B.S., op. cit.

⁴ Eight institutions constitute the core of the *BioCubaFarma* network: The Center of Genetic Engineering and Biotechnology (CIGB), The Center of Molecular Immunology (CIM), The Finlay Institute (IFV), The Center of Immunoassay (CIE), The Neurosciences Center (CNEURO), The National Center for Scientific Research (CNIC), The Central Institute for Digital Research (ICID), and FARMACUBA (that manages the export of generic drugs, blood-derived products, and human placenta-derived products, and the import of raw materials, packaging materials, pharmaceuticals, reagents, equipment, and spare parts for the Cuban pharmaceutical and biotechnological industry). <https://biopharmadealmakers.nature.com/users/114910-biocuba-farma/posts/35960-biocubafarma-bringing-cuban-biopharma-to-the-world>.

⁵ O. Freire Santana, op. cit.

⁶ The history of Cuba's biotechnology industry was taken from: Dr. Rodolfo Stusser (Maria C. Werlau, telephone conversation, Apr. 3, 2020); Lilliam Riera, "Todo comenzó con el Interferón," *Granma*, Jun. 6, 2011; Orfilio Peláez, "Símbolo de un asombroso despegue," *Granma*, Jul. 1, 2016; and H. Yaffe, "Cuba's Contribution," op. cit.

leading cancer treatment center in the world,⁷ and a group of doctors and scientists from the U.S. They met with Fidel Castro “and convinced him that interferon was *the* wonder drug,”⁸ “the future.”⁹ Castro became obsessed with interferon and sent Cuban hematologist-immunologist Dr. Manuel Limonta with Dr. Victoria Ramirez to Houston to work at Dr. Clark’s lab, at his invitation. Limonta was not a researcher and was chosen due to his revolutionary credentials; he was a Lieutenant in the Directorate of Personal Security (Ministry of the Interior), Fidel Castro’s huge personal security force—or praetorian guard—and worked at the clinic for the exclusive use of Fidel and the top nomenklatura.¹⁰ The doctors



Fidel Castro with Dr. Randolph Lee Clark and U.S. scientists, Nov. 1980.

returned to Cuba with the latest research on interferon as well as key contacts, and soon six Cubans (led by Dr. Luis Herrera,¹¹ a geneticist, and the late Dr. Pedro López Saura, a biochemist) were on their way to Finland under the auspices of Finnish doctor Kari Cantell, who in the 1970s had isolated interferon from human cells. They spent twelve studying procedures and techniques, returning to Cuba with the formula for interferon. Cuban scientists were then sent to study techniques and procedures in Germany, France, Japan, the Soviet Union, and Eastern European countries.



Dr. Randolph Lee Clark

Castro embraced biotechnology in his quest to overcome Cuba’s complete dependency on commodities (sugar, nickel, tobacco, and rum) and catapult the small country into a select group of scientifically-advanced nations. The “Biological Front” was established in 1981 to develop a biotechnology sector that could generate export revenues. The first lot of the leukocyte interferon was harvested in May 1981 in a government house in Havana (Protocol House No. 149 at Reparto Atabey). It was used during an epidemic of hemorrhagic conjunctivitis and a subsequent dengue epidemic. The Cubans learned to produce large commercial quantities of interferon, a primary goal of their efforts, and in January 1982 was inaugurated the Biological Research Center, a forerunner of the CIGB, later established by a group of six Cuban specialists led by Dr. Herrera and Dr. López Saura. A large investment was made to build “state of the art” facilities and the showpiece Center for Genetic Engineering and Biotechnology (CIGB) opened in 1986, becoming a large complex of a dozen buildings.¹²

The Cuban recombinant interferon alpha 2b drug has been used in treatments for HIV-AIDS, hepatitis B and C, herpes zoster or shingles, dengue and different types of cancers.¹³ It is produced in China with Cuban technology by *Changchun Heber Biotechnology Co., Ltd.*, also referred to as Chang-Heber, a capitalist joint venture

⁷ See <https://www.mdanderson.org>.

⁸ Helen Yaffe, “Cuba’s Contribution,” op. cit.

⁹ <http://www.cubabiotechnology.com/interferon.htm>.

¹⁰ M. Werlau, telephone interview with M.D., Anonymous Source No. 2, op. cit.

¹¹ Hugo Nodarse-Cuní, Pedro A López-Saura, Abstract: “Cuban interferon alpha-2b. Thirty years as an effective and safe drug,” Direction of Clinical Research, Center for Genetic Engineering and Biotechnology, CIGB, *Biocología Aplicada* versión on-line ISSN 1027-2852, *Biocitol Apl* vol.34 no.1 La Habana ene.-mar. 2017, http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S1027-28522017000100002.

¹² See <http://www.cigb.edu.cu/sobre-cigb/> and L. Prado, op. cit.

¹³ Vinay, B.S., op. cit.

between the Communist governments of China and Cuba. The corporate entity was created from a bilateral agreement between the governments of Cuba and China of 2001, the China-Cuban Economic and Technical Cooperation Agreement, and a subsequent Memorandum of Understanding on Cooperation in Biotechnology of November 2004.¹⁴ The joint venture has been producing in the town of Changchun, Jilin province, the recombinant human interferon 2b injection since 2007, when it was incorporated into health insurance plans in China to treat pathologies such as hepatitis B and C; four million doses had been used to treat 100,000 patients until the end of 2019.¹⁵ A production plant was inaugurated in 2013¹⁶ and a new plant was inaugurated January 25, 2020, on the Chinese new lunar year.¹⁷ The company's website indicates that current production is 10 million injections of the product in four different dosages for export to countries in Asia and South America.¹⁸



Press conference by BioCubaFarma, Havana, March 13, 2020. Photo: Granma.

To fuel the global publicity campaign for the Cuban interferon to treat COVID-19, *BioCubaFarma* held a press conference in Havana on March 13th 2020 to announce that Cuba had been flooded with requests for the drug. It was covered by international correspondents that “let the world know that the Cuban pharmaceutical industry was guaranteeing production of proven, high efficacy treatment medications” for the coronavirus.¹⁹ CIGB's General Director, Eulogio Pimentel, reported that a supply of the drug was available to treat the estimated number of cases that could appear in Cuba for three to six months as well as guarantee production to meet the requests that had been received and produce 21 other products to treat coronavirus. Marta Ayala, CIGB Vice President, explained in cautious language that the interferon “could be a correct approximation to the range of treatments that are being used” and that “a specific and effective treatment has not been defined but is included in the lines of treatment.” Eduardo Martínez, *BioFarmaCuba's* director, explained that scientists agree that it is not a cure but “could be effective in treating COVID-19, especially in the early stages of the illness and combined with other drugs.” Martínez, also acknowledged that 15% of medicines supplied by Cuba's

¹⁴ Chang Heber, Company Profile, <http://www.changheber.com/zn/content.php?ClassId=1>.

¹⁵ Lisandra Prado, “Del Interferón, su valor científico y humano,” Centro de Ingeniería Genética y Biotecnología, Mar. 26, 2020, <http://www.cigb.edu.cu/del-interferon-su-valor-cientifico-y-humano/>.

¹⁶ L. Prado, “Más de 45 países solicitan,” op. cit.

¹⁷ “Cuban drug among those used to fight coronavirus in China,” *Ahora*, Feb. 6, 2020.

¹⁸ Yaditza del Sol González, “El Interferón que ayuda a tratar la Covid-19: de su origen hasta hoy,” *Granma*, Mar. 19, 2020; Chang Heber, Company Profile, op. cit.; L. Prado, op. cit.

¹⁹ “Cuba reserva suficiente antiviral para tratar el Covid-19 en otros países,” *La Habana*, *EFE*, Mar. 13, 2020; Walkiria Juanes Sánchez and Yaditza del Sol González, “Biocubafarma garantizará producción de los 22 medicamentos para el tratamiento del Covid-19,” *Granma*, Mar. 13, 2020. Yaditza del Sol González, “Despite U.S. blockade, Cuban pharma industry producing needed COVID-19 medicines,” March 17, 2020, <https://www.peoplesworld.org/article/despite-u-s-blockade-cuban-pharma-industry-producing-needed-covid-19-medicines/>. (Quotes translated from Spanish.)

biotech industry were currently missing from pharmacies and that “distribution cycles have been extended as a result of difficulties in acquiring raw materials and a lack of spare parts for equipment used in the manufacturing process.”²⁰ Cuba’s population, of course, has endured a pervasive scarcity of medications for decades.

Despite measured claims by CIGB’s executives, the story has replicated without their caveats, which is unsurprising given Cuba’s ability to successfully create and deploy “active measures”²¹ through its seasoned intelligence and propaganda apparatus. Among the fawning worldwide coverage of “the Cuban drug,” *Newsweek* ran a piece titled: “Cuba uses ‘wonder drug’ to fight coronavirus around world despite U.S. sanctions.”²² Its source was University of Glasgow’s Helen Yaffe, who told *Newsweek* of countries, mayors, and hospital directors “anxious to get hold of the Cuban anti-viral to meet the crisis.” *Newsweek* did not bother to fact-check or consult other opinions and failed to note that Yaffe is an overt sympathizer of the Cuban dictatorship. Ms. Yaffe’s doctorate thesis was on Che Guevara’s “contribution to socialist political economic debates” and she recently authored the book *We Are Cuba!: How a Revolutionary People Have Survived in a Post-Soviet World*.^{23/24} *Newsweek*, however, did print verbatim claims that “Cuba’s ambitious anti-pandemic efforts are hindered ... by decades-long U.S. sanctions,” and cited a Cuban official’s declaration that it was “the main obstacle not only to respond to major health crises like covid-19.” Scores of stories all over the world replicated Yaffe’s blog, which is published by the London School of Economics.²⁵

Cuba was soon cashing in. Immediately, it was reported that it had signed an agreement with Venezuela to guarantee the supply of the drug²⁶ and that the government of El Salvador was requesting three thousand units.²⁷ The Mayor of Recoleta, Chile, Daniel Jadue, was cited as tweeting: “We started import procedures for Interferon 2b, a Cuban medicine used successfully in China and Spain.”²⁸ In Colombia, more than 2,000 people sent a letter asking President Iván Duque to request it to deal with the coronavirus crisis.²⁹ By March 26th 2020, Cuba reported that 45 countries had requested the product.³⁰ By the end of April, Cuba was reporting that

²⁰ Ibid. (Quotes translated from Spanish.)

²¹ Cuba’s Directorate of Intelligence has an Active Measures department, dedicated to operations of propaganda, disinformation, and other concerted actions (forging documents, white and black clandestine operations, etc.) designed to advance Cuba’s objectives. This form of political, or asymmetrical, warfare was learned from the former KGB and has been perfected by Cuba.

²² Tom O’Connor, “Cuba uses ‘wonder drug’ to fight coronavirus around world despite U.S. sanctions,” *Newsweek*, Mar. 24, 2020, <https://www.newsweek.com/cuba-drug-fight-coronavirus-us-sanctions-1493872>.

²³ According to Helen Yaffe’s biographical information, she is an economic historian specializing in Cuba and Latin America and Visiting Fellow at the Latin America and Caribbean Centre and a Lecturer in Economic and Social History at the University of Glasgow. Her doctorate dissertation was on Ernesto Che Guevara’s “economic work as a member of Cuba’s revolutionary government and his contribution to socialist political economy debates.” (The London School of Economics and Political Science, <http://www.lse.ac.uk/lacc/people/research-staff/Helen-Yaffe/>.) Amazon’s page on Yaffe’s book *We are Cuba!* reads: “Examining key domestic initiatives including the creation of one of the world’s leading biotechnological industries, its energy revolution, and medical internationalism alongside recent economic reforms, Yaffe shows why the revolution will continue post-Castro.” (www.amazon.com.)

²⁴ Helen Yaffe, “Cuba’s contribution to combating COVID-19,” Mar. 12, 2020, <http://blog.yalebooks.com/2020/03/12/cubas-contribution-to-combating-covid-19/>

²⁵ See, for instance, “Cuba’s Interferon drug effective against coronavirus,” *PM News Nigeria*, Mar. 22, 2020, <https://www.pmnewsnigeria.com/2020/03/22/cubas-interferon-drug-effective-against-coronavirus/>.

²⁶ “Cuba y Venezuela pactan acuerdo para tratar Covid-19,” *El Informador*, Mar. 17, 2020, <https://www.elinformador.com.ve/venezuela/cuba-y-venezuela-pactan-acuerdo-para-tratar-covid-19/>.

²⁷ Beatriz Calderón, “Gobierno salvadoreño comprará antiviral cubano que fue usado en China para recuperación de pacientes con coronavirus,” *EFE*, Mar. 16, 2020, <https://www.laprensagrafica.com/elsalvador/Gobierno-salvadoreno-comprara-antiviral-cubano-que-fue-usado-en-China-para-recuperacion-de-pacientes-con-coronavirus-20200316-0015.html>.

²⁸ Vinay, B.S., op. cit.

²⁹ “Cuba solidaria ante propagación del coronavirus en el mundo,” op. cit.

³⁰ Orfilio Peláez, “Más de 45 países solicitan el interferón contra la COVID-19,” *Granma*, Mar. 27, 2020, <http://www.granma.cu/cuba-covid-19/2020-03-27/mas-de-45-paises-solicitan-el-interferon-contra-la-covid-19-27-03-2020-01-03-21>.

more than 80 countries had expressed interest in acquiring the product.³¹ Cuban official media has also reported the interferon as part of a pandemic package-deal with many of the emergency medical brigades it is sending to countries around the world with exploited Cuban health workers.³²

BioCubaFarma is certainly under great pressure to sell its products. Due to Cuba's debt defaults and non-payments of its commercial credits, in January 2019, suppliers from Russia, India, China, Spain, Canada, and other countries had cut financing for the raw materials Cuban institutions must import to produce drugs.³³ In January 2020, a microbiologist who had worked in the industry for two decades reported that the company had "reassigned" 150 of its laboratory specialists, explained as resulting from "the severe economic crisis the country is facing."³⁴ The company confirmed "the need to implement a temporary work interruption process" and was "seeking work placement in other entities ... in need of a workforce," as the highly-trained scientists were offered positions such as guards and recreation assistants.³⁵ The decrease in demand from Bolivarian Venezuela, that had reportedly purchased \$2.2 billion in medical products over 15 years,³⁶ has apparently played a large role. Despite many billions of dollars in debt forgiveness by external creditors, Cuba has been unable to pay the interest and principal for the defaulted debt (since 1986) it had restructured in 2015 with 14 Paris Club creditor nations at extremely favorable terms, including forgiveness of \$8.5 billion, or 77% of the \$11.1 billion total.³⁷



Cuba's interferon: facts vs. propaganda

Cuba's Center for Genetic Engineering and Biotechnology (CIGB) describes its human recombinant interferon alpha 2b in appropriately measure terms: "Since its introduction more than three decades ago in our national health system, this product has shown its efficacy and safety in the treatment of viral diseases such as hepatitis b and c, herpes zoster (popularly called shingles) and HIV/AIDS. Its choice by the Chinese medical authorities to be used against the new coronavirus responds to the fact that these viruses generally decrease the natural production of interferon in the human body and the Cuban drug is capable of compensating for that deficiency by strengthening the immune system of patients afflicted by the aforementioned respiratory ailment."³⁸ Its initial production of the drug, we have seen, owes to donated research and development from

³¹ Orfilio Peláez, Confirman efectividad de interferón cubano contra la COVID-19, *Granma*, Apr. 29, 2020.

³² By May 19th, Cuban authorities were reporting 26 medical brigades with 1,300 "collaborators."

("En vivo: Ministro de Salud de Cuba participa en la 73a Asamblea Mundial de la Salud," *Granma*, May 18 2020.)

Cuba Archive, however, had tracked 26 brigades to 25 countries with 2,993 workers ("collaborators"), most bearing the by the interferon. See CubaSalud.org for reports on Cuba's trafficking of health and other workers.

³³ Juan Juan Almeida García, "Afirman que detención de directivo de FARMACUBA subraya cisma entre militares cubanos y Díaz-Canel," *Diario Las Américas*, Jan. 4 2019, <https://www.diariolasamericas.com/america-latina/afirman-que-detencion-directivo-farmacuba-subraya-cisma-militares-cubanos-y-diaz-canel-n4169420->.

³⁴ Mario J. Pentón, "La crisis económica obliga a Cuba a 'reubicar' a más de 150 laboratoristas de medicamentos," *El Nuevo Herald*, Jan. 19, 2020.

³⁵ Ibid.

³⁶ Patricia Marcano and Luz Escobar, "Una sobredosis de Farmacuba mató a la industria farmacéutica venezolana," *Caracas/La Habana, 14 y medio*, Apr. 15, 2019, https://www.14ymedio.com/reportajes/sobredosis-Farmacuba-industria-farmacaceutica-venezolana_0_2637936181.html.

³⁷ Marc Frank, "Exclusive: Cuba fails to make payment in key debt accord, sources say," *Havana, Reuters*, Feb. 11, 2020. (Interest was forgiven through 2020 and after that is just 1.5% of the total debt still due, of which repayment in annual installments was backloaded through 2033 and some of that money allocated to funds for investments in Cuba. Frank cites a diplomat in Havana: "The agreement is extremely beneficial for Cuba and that they could not pay speaks volumes about how broke they are.") Cuba owed an estimated \$80 million last year, paying some countries in full, but not others, including the largest creditors Spain, France and Japan, the diplomats said.

³⁸ Lisandra Prado, "Más de 45 países solicitan el interferón contra la COVID-19," Apr. 1, 2020, <http://www.cigb.edu.cu/mas-de-45-paises-solicitan-el-interferon-contra-la-covid-19/>. (Translation from Spanish.)

the United States, Finland, and other countries. In addition, Cuba developed huge country-wide campaigns to draw large amounts of blood from uncompensated and unknowing donors that it was able to use in the initial production (later developed as a laboratory product). It also enjoys an economic edge from its condition as sole employer and sole regulator—it pays top scientists and biotechnicians meager wages and its drugs evade the costly trials and cumbersome regulatory standards of most countries.

A researcher from the University of Lausanne, Nils Graber, told *Agence France Press* (AFP) news agency that interferon is an “imitation” drug, a product with almost identical clinical results with minimal pharmacological differences, and that Cuba’s production was probably a less expensive product.³⁹ A biotechnician consulted for this piece concurred that the Cuban product is not at all unique and most likely just produced at a lower cost due to the low salaries of the Cuban scientists and the comparatively lax standards. She explained that in the U.S. and most developed countries the sale of interferon is highly regulated and, thus, its production and resulting sale price are costly.⁴⁰

Interferon was discovered in 1957 by British bacteriologist Alick Isaacs and Swiss microbiologist Jean Lindenmann. The various forms of interferon (IFN) are secreted by cells of animals, including all vertebrates, in response to stimulation by a virus or other foreign substance; they are the body’s most rapidly produced and important defense against viruses. The name interferon comes from their ability to interfere with viral proliferation, which they do by stimulating the infected cells and those nearby to produce proteins that prevent the virus from replicating within them (thus, they do not directly inhibit the virus’s multiplication). Research conducted in the 1970s revealed that, aside from preventing viral infection, the natural production of interferon in the human body in strengthening the immune system could suppress the growth of cancers. In the 1980s, alpha interferon came into use to, in low doses, treat hairy-cell leukemia (a rare form of blood cancer) and, in higher doses, fight the Kaposi sarcoma that frequently appears in AIDS patients.⁴¹

Cuba first produced the natural IFN alpha in 1981 at CIGB from Sendai virus-induced leukocytes from blood donors.⁴² The recombinant interferon alfa-2b that it commercializes is “an interferon clone,” a form of commercially available interferon alfa that has been used to treat viral diseases such as chronic viral hepatitis (types C and B), certain tumors, such as hairy cell leukemia, chronic myeloid leukemia, multiple myeloma, laryngeal papilloma, low to moderate non-Hodgkin's lymphoma, kidney cancer, and malignant melanoma.⁴³ It has been made since 1986 in the laboratory using recombinant DNA technology techniques.⁴⁴ Since 1986, the

³⁹ E. Torres, op. cit.

⁴⁰ The interviewee is a university professor of biotechnology who owned a laboratory for many years and wishes to remain anonymous. (Maria Werlau, telephone conversation, Anonymous Source 3, Mar. 16, 2020.)

⁴¹ Interferons are made and secreted by cells of the immune system such as white blood cells, natural killer cells, fibroblasts, and epithelial cells. They are a family of naturally-occurring proteins considered one of the most active biological substances. Three classes of interferons have been identified: alpha, beta, and gamma. Their multifunctional character allows them to influence several cell processes, either as a component of the immune system during the defensive response in the presence of a virus, parasites, and certain tumors, or by inhibition or modulation of cell differentiation and proliferation. (The Editors of *Encyclopaedia Britannica*, Interferon, <https://www.britannica.com/science/interferon>; <https://www.cancer.gov/publications/dictionaries/cancer-terms/def/recombinant-interferon-alfa-2b>; Vinay, B.S., op. cit.; Eni Williams, MD, and Jay W. Marks, MD, Interferon, *Medicine Net*, https://www.medicinenet.com/interferon/article.htm#what_are_the_side_effects_of_interferons; <http://www.cubabiotechnology.com/interferon.htm>; Helen Yaffe, "Cuba's Contribution to Combatting COVID-19," op. cit.)

⁴² H. Nodarse-Cuní, Abstract: “Cuban interferón”, op. cit.

⁴³ <http://www.changheber.com/zn/productlist.php?ClassId=2#>.

⁴⁴ Recombinant DNA technology has five steps: (1) cutting the desired DNA by restriction sites, (2) amplifying the gene copies by PCR, (3) inserting the genes into the vectors, (4) transferring the vectors into host organism, and (5) obtaining the products of recombinant genes. (“Recombinant DNA Technology,” Science Direct, <https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/recombinant-dna-technology>.)

success in producing the recombinant IFN gave way to the introduction and commercialization of diverse types and formulations of interferon by CIGB.⁴⁵

The effectiveness of Cuba's interferon for treatment of COVID-19 remains to be proven. Only one scientific journal contribution in English can be found online on this topic, with an intent to treat and no findings as well as bearing a good dose of Chinese nationalist propaganda.⁴⁶ The piece is titled "Diagnosis and treatment of 2019 novel coronavirus infection in children: a pressing issue," and its authors, presumably two Chinese scientists, explain that IFN use will be evaluated in 28 confirmed COVID-19 pediatric patients, children from 1 month to 17 years, with relatively milder clinical symptoms than infected adults. As basis, they cite confirmation since 1973 by the British Medical Research Center that IFN could prevent and treat respiratory virus infections as well as multi-center clinical studies in children from China that show that IFN atomization can reduce the viral load, alleviate symptoms and shorten disease duration in treating viral infections including bronchiolitis, viral pneumonia, acute upper respiratory tract infection and hand, foot and mouth disease.⁴⁷ It seems reasonable to conclude that, if China had found the Cuban product so effective, it would have made the evidence much more visible in scientific circles.

On March 20, 2020, the World Health Organization (WHO) announced a large global trial, called *Solidarity* to evaluate the treatment of coronavirus with the combination of two antivirals with interferon beta. However, according to the publication *Science*, Susanne Herold, an expert on pulmonary infections at the University of Giessen, "the use of interferon-beta on patients with severe COVID-19 might be risky. ...if it is given late in the disease it could easily lead to worse tissue damage instead of helping patients."⁴⁸ In fact, media coverage on Cuba's interferon fails to mention its risks and adverse effects, which are not to be dismissed and cannot be assessed independently. Cuba's scientists working in the production of all pharmaceuticals and biotech products are all employees of the state. There is no independent body to regulate and supervise the state's biotechnology industry, no elected officials to hold it accountable, no judicial guarantees to uphold patient rights, and no civil society to monitor and defend them.

The problem with assessing the quality and safety of Cuba's drugs is pervasive. An M.D. and medical researcher who practiced in Cuba for fifty years (1962-2010) reports that a lack of scientific rigor is pervasive, including in testing all biotechnology products, and that merit is not the criteria to advance in the field, as all leading scientists are part of the Cuban Communist Party and must be politically-involved.⁴⁹ Biographical information for the Minister and Vice-Minister of Health and other high-ranking health authorities are stories of stellar Cuban Communist Party apparatchiks. A U.S. scientist hired by the WHO to work on a project in Cuba, reported anonymously that none of the publications offered by Cuba's experts met industry standards.⁵⁰

According to Cuba, its recombinant IFN alpha 2b marketed as Heberon Alfa R, produced by CIGB, is "well-tolerated, effective and safe." But its scientists cite 28 years of reports of adverse events from 147 clinical trials or "healthy assistances" using the product, reporting adverse events in 84% of the 4,864 subjects, mostly corresponding to the flu-like syndrome, with higher frequency in white male patients. (They do report that hypothyroidism and immunogenicity behaved lower than similar products in the international pharmaceutical

⁴⁵ Ibid.

⁴⁶ The article ends with this: "Chinese government is taking strong measures to mobilize the whole society to fight against the epidemic. We are fully confident to win the battle against the epidemic. Pediatricians in China will stay in line with the Chinese government make all-out efforts to prevent and control the epidemic and protect children's lives and health. (Kun-Ling Shen & Yong-Hong Yang, "Diagnosis and treatment of 2019 novel coronavirus infection in children: a pressing issue," *World Journal of Pediatrics*, Feb. 5, 2020, <https://link.springer.com/article/10.1007/s12519-020-00344-6>.)

⁴⁷ Ibid.

⁴⁸ Kai Kupferschmidt, Jon Cohen, "WHO launches global megatrial of the four most promising coronavirus treatments," *Science*, Mar. 22, 2020, <https://www.sciencemag.org/news/2020/03/who-launches-global-megatrial-four-most-promising-coronavirus-treatments>.

⁴⁹ Maria C. Werlau, telephone interview with a Cuban M.D. (Anonymous Source No. 2) whose identity remains confidential to avoid reprisals, April 3, 2020.

⁵⁰ Confidential report to the author from a trusted source, by telephone, Mar. 25, 2020.

market and that approximately 60% of the treated patients obtained a relevant therapeutic response.)⁵¹ Cuba's own research indicates a high rate of adverse effects in findings for 1981-2014 on studies in more than 8,000 individuals from Cuba, Pakistan, Iran, Ukraine, Brazil, and many other countries that evaluated therapeutic effects for 69 diseases and associated with "substantial toxicity in relation to the neurologic, cutaneous, musculoskeletal, gastrointestinal, cardiovascular, renal, hepatic, and hematologic systems" whose main manifestation is the flu-like syndrome, represented by headache, fever, chills, asthenias, myalgia and arthralgia."⁵² Notwithstanding, the incidence and severity of the adverse effects was reported as dose-related and "completely reversible with interruption of therapy."⁵³

Aside from flu-like symptoms (chills, headache, muscle aches, pains, and malaise), a host of side effects may occur with all interferons: fatigue, diarrhea, nausea, vomiting, abdominal pain, joint aches, back pain, dizziness, anorexia, congestion, increased heart rate, confusion, low white blood cell count, low platelet count (thrombocytopenia), low red blood cell count, increase in liver enzymes, increase in triglycerides, skin rashes, mild hair loss or hair thinning, swelling (edema), cough, difficulty breathing, allergic or anaphylactic reaction. Some interferons are associated with liver failure and depression and suicide have been reported, however, it is unclear whether depression and suicidal thoughts are caused by the diseases being treated or the interferons themselves.⁵⁴

The director of the Pasadena Liver Center and the California Liver Research Institute, hepatologist Edward Mena, who has years of experience working with interferon, *El Confidencial* of Nicaragua that there were no studies indicating that the interferon has been used successfully in China to counter the COVID-19 disease. Certain that interferon causes serious secondary effects, he reported having found that using interferon on very ill patients was more harmful to the patients.⁵⁵ Furthermore, a study⁵⁶ led by professors Alex K. Shalek, from the Massachusetts Institute of Technology (MIT), and José Manuel Ordovás-Montañés, from Boston Children Hospital, a Harvard University Teaching Hospital, debunked interferon as an advisable treatment for COVID-19. The research focused on deciphering how the virus "colonizes" the tissues of those affected with the new coronavirus and discovered that the virus uses interferon to enhance the infection. Interferon, an essential molecule that usually interferes with replication of most viruses, instead of serving as a shield for the COVID-19, favors the creation of more anchor points and makes it more virulent and serious. Giving patients interferon, the researchers found, opens more doors for the virus to enter the body.⁵⁷ Luisa Villar, head of the Immunology Department at the research hospital in Spain, Hospital Universitario Ramón y Cajal de Madrid, similarly reported that Type I interferons such as the alfa and beta were not performing as expected and were, rather, magnifying the viral infection. By March 19, 2020, Villar had advised other hospitals of these findings, though noting that the evidence was insufficient because of the small number of patients studied. The Spanish Ministry of Health had sent out a notice that the interferons were not recommended.⁵⁸

But Cuba continues to insist that the interferon works. In mid-May 2020, Cuba's official media was citing Dr. Pimentel, Director of the CIGB, citing a Cuba's Ministry of Health (MINSAP) report of April 14, 2020 that 93.4% of patients in Cuba with the coronavirus had been treated with Heberon (Cuba's recombinant human interferon alpha 2b), of which only 5.5% had reached a state of gravity, and a fatality rate of 0.9% of

⁵¹ Ibid.

⁵² H. Nodarse-Cuní, Abstract: "Cuban interferón," op. cit.

⁵³ Ibid.

⁵⁴ E. Williams, MD, and J. Marks, MD, op. cit.

⁵⁵ Wilfredo Miranda Aburto, "El Interferón cubano es una falsa esperanza" ante el coronavirus," *El Confidencial*, Apr. 11, 2020.

⁵⁶ Carly G.K. Ziegler, Samuel J. Allon, Sarah K. Nyquist, Alex K. Shalek and Jose Ordovas-Montanes, SARS-CoV-2 Receptor ACE2 Is an Interferon-Stimulated Gene in Human Airway Epithelial Cells and Is Detected in Specific Cell Subsets across Tissues, *Cell*, Apr. 24, 2020. [https://www.cell.com/cell/fulltext/S0092-8674\(20\)30500-6](https://www.cell.com/cell/fulltext/S0092-8674(20)30500-6).

⁵⁷ María Usán, "Ordovás-Montañés, inmunólogo en Harvard: "Sabemos cómo circula el coronavirus pero muy poco de cómo afecta a cada persona," *Heraldo*, May 1, 2020.

⁵⁸ Ibid.

patients treated with the drug from an overall fatality rate of 2.7% (better than an alleged worldwide fatality rate above 6%). He also reported that in Wuhan, China, a study had indicated that 2,944 medical personnel had received the drug as part of an investigation and none had contracted the disease, whereas 50% of the untreated, 3,387, that did not receive it had contracted the disease. Pimentel declared: “The data shows that the protocol in our country is effective, and interferon plays a role in the results.”⁵⁹ For his part, on May 18th, at the 73rd World Health Assembly in Geneva, Cuba’s Health Minister paid the usual homage to Cuba’s free health care system, alleged 100% health coverage, and medical-pharmaceutical and biotechnology industry with “novel products” for the treatment of COVID-19, such as interferon alfa 2B, also mentioning monoclonal antibodies, the CIGB 258 peptide, and Surfacen.⁶⁰

Cuba’s “wonder” interferon sounds familiar.⁶¹ Its so-called “miracle” vaccine for lung cancer has been prominent news for years and a clinical study of the drug is underway at the Roswell Park Cancer Institute in Buffalo, New York. Among scores of stories circulating in several languages, *Public Radio International*, with a monthly audience of 20 million,⁶² has run several with titles such as this: “Cuba has had a lung cancer vaccine for years. Many U.S. patients can’t get it without breaking the law.” Some clearer heads remain in journalism. Seasoned journalist Glenn Garvin wrote in March 2020 that a *PBS* show by Nova “Cuba’s Cancer Hope” “goes off the rails” in claiming that Cuba’s development of a lung-cancer vaccine called CIMAvax is a “cutting-edge” medicine. Citing its “internet mythic status,” Garvin explains that “it barely works at all.” Cuba’s own clinical trials show that it extends life 3 to 5 months on average and that the 5-year survival rate is about 15%, roughly the same as other approved cancer therapies in the U.S. He writes: “The same could be said of about 200 other clinical studies of various lung cancer treatments being carried out at the moment, but there’s no sign of Nova doing an episode on ‘Norway’s Cancer Hope’ or ‘The Mayo Clinic’s Cancer Hope.’ Of course, none of them would invite any discussion of the genius of Fidel Castro.”⁶³

This article is from the series “Cuba in the time of coronavirus: exploiting a global crisis”:

Part I: Pandemic as opportunity.

Part II: Coronavirus in Cuba: a perfect storm.

Part III: Interferon, Cuba’s so-called “wonder drug” for COVID-19.

Coming soon:

Part IV. Dark secrets of Cuba’s biotechnology industry.

Part V. The real story of Cuba’s medical diplomacy.



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⁵⁹ O. Peláez, “Confirman efectividad de interferón cubano,” op. cit.

⁶⁰ Ibid.

⁶¹ Sally Jacobs, “Cuba has a lung cancer vaccine. Many U.S. patients can’t get it without breaking the law,” *PRI/USA Today*, Jan. 9, 2018, <https://www.usatoday.com/story/news/world/2018/01/09/cuba-has-lung-cancer-vaccine-many-u-s-patients-cant-get-without-breaking-law/1019093001/>; Ioan Grillo, “Cuba has had a lung cancer vaccine for years,” Mexico City, *PRI*, <https://www.pri.org/stories/cuba-has-had-lung-cancer-vaccine-years>.

⁶² *Public Radio International (PRI)* is a global non-profit media company founded in 1983 and headquartered in Minneapolis, MN, whose audio, text and visual content is currently consumed by almost 20 million people each month. (<https://www.pri.org/about-pri>)

⁶³ Glenn Garvin, “No, Cuba is not exactly the cancer pioneer Nova attempts to Present,” *Reason.com*, Mar. 27, 2020. <https://reason.com/2020/03/27/no-cuba-is-not-exactly-the-cancer-pioneer-nova-attempts-to-present>.