



Shared Challenges in Aging and Disaster Management between the United States and Cuba: Exploring Collaboration Opportunities

Hight Level Meeting

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Senior Researcher

Main Topics

- ❖ **Cuba-US Cooperation Overview**
- ❖ Cuba and USA: Global Challenges
- ❖ Strengths of the Cuban Science System

Introduction

- ❖ Cuba and the U.S. have a long history of scientific collaboration that dates to the 1800s.
- ❖ Cuba and the U.S. have the oldest Academies of Sciences outside Europe.
- ❖ Cuban naturalist Felipe Poey deposited many of his specimens, results of his studies on fish species in the waters around Cuba, in U.S. institutions as Smithsonian and Harvard University.
- ❖ In the late 19th century, Carlos Finlay's collaboration with Jesse Lazear of Johns Hopkins University corroborated Finlay's theories presented 20 years earlier about the mosquito as a vector of yellow fever transmission.
- ❖ Those actions paved the way for closer collaboration between scientists in the United States and Cuba.



*Ronda-Pupo GA (2021) Cuba—U.S. scientific collaboration: Beyond the embargo. PLoS ONE 16(7)
Pastrana S. MEDICC Review, April 2018, Vol 20(2)*



MOU signed between the Cuban Academy and the Smithsonian Institution, 1980. Tirso Saenz and Dillon Ripley, Secretary of the Smithsonian.



February 1992, Anniversary of the CAS Visit in Havana of Dr. William Golden, Treasurer and member of the Board of AAAS.



Rita Colwell, President of AAAS bilateral visit to the Cuban Academy of Sciences, 1997



AAAS President Peter Agre visited Cuba with Eight U.S. science leaders hopeful that the two nations will expand cooperative projects to address shared scientific interests, 2009



April 2014. AAAS and the Cuban Academy of Sciences sign an agreement to formalize cooperation.

Signing of the MoU between AAAS and ACC



2022: October 28th



Memorando de Cooperación entre la Asociación Americana para el Avance de la Ciencia y la Academia de Ciencias de Cuba

El 28 de octubre de 2022, representantes de la Asociación Americana para el Avance de la Ciencia (en adelante, AAAS) y la Academia de Ciencias de Cuba (en adelante, ACC) se reunieron en La Habana, Cuba, para renovar el Memorando de Cooperación firmado en 2014.

Ambas partes revisaron los logros en la cooperación bilateral durante los últimos ocho años, los cuales se centraron en una amplia gama de temas que incluyen salud e investigación biomédica; renovaron su compromiso con una mayor cooperación científica; y discutieron cómo fortalecer aún más su asociación. Este acuerdo proporciona un instrumento para promover la cooperación entre AAAS y ACC.

La AAAS se fundó en 1848 y durante los últimos 174 años se ha convertido en una de las sociedades científicas multidisciplinarias más grandes del mundo con miembros en todo el mundo. La misión de AAAS es promover la ciencia, la tecnología y la innovación internacionalmente para el beneficio de todos y cumple su misión a través de sus actividades e iniciativas programáticas, que tienen como objetivo fortalecer las relaciones entre la comunidad científica y grupos influyentes de la sociedad, incluidos tomadores de decisiones, diplomáticos y juristas.

La ACC es una de las academias nacionales de ciencias más antiguas fuera de Europa, fundada en 1861. Es una Academia de Ciencias multidisciplinaria de proyección nacional, con filiales en varias provincias. Trabaja para fomentar el desarrollo de la ciencia cubana y difundir el progreso científico y universitario, reconocer la excelencia científica en el país, elevar la ética profesional y el reconocimiento social de la ciencia, y estrechar los vínculos entre los científicos y la sociedad y el resto del mundo.

La AAAS y la ACC acuerdan trabajar conjuntamente para identificar posibles subacuerdos a este Memorando que ayuden a avanzar en temas como la conservación del medio ambiente, estudios oceánicos y marinos, salud, política científica y otros temas de interés mutuo.

Los mecanismos potenciales para la cooperación en tales actividades incluyen talleres, simposios, publicaciones conjuntas e intercambios de investigación. Los temas específicos para la cooperación entre la ACC y la AAAS serán acordados por las partes, de acuerdo con sus políticas internas. Este acuerdo permite a los signatarios celebrar dichos subacuerdos.

Este Memorando expirará cinco (5) años después de su firma y se renovará automáticamente a menos que sea cancelado por alguna de las dos partes. Cualquiera de las partes puede cancelar este MoU en determinado momento mediante notificación por escrito a la otra parte.



Dr. Cs. Luis Velasco Pérez
Presidente de la Academia de Ciencias de Cuba

Dr. Sudip S. Parikh
Director Ejecutivo de AAAS
Editor Ejecutivo, familia de revistas científicas Science

Los principales puntos de contacto para este Memorando serán:

Dra. Olga Fernández Ríos
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The MoU's purpose is to build bridges of scientific cooperation between our nations

Addressing Shared Challenges at a High-level Symposium on the Future of the United States-Cuba Scientific Cooperation in Havana from March 20-21, 2023.





Meeting with NOAA's Elizabeth McLanahan and Dan Muller, Acting Director of NOAA's National Weather Service Office of International Activities. **16 October, 2023**



Conversation between Sudip Parikh and Luis Velazquez Auditorium, **AAAS headquarters. 17 October**



October, 17: Meeting with National Academies of Science (Virtual remarks by Dr. Marcia McNutt). Joining in person: Dr. Lauren Augustine Alexander, Dr. Monica Feit, Vaughan Turekian and Franklin Carrero-Martinez.



Visit to the Georg Washington University

MEETING with the U.S. National Institutes of Health

October 18, 2023

- ❖ National Institute of Allergy and Infectious Diseases (NIAID)
- ❖ National Institute of Minority Health and Health Disparities (NIMHD)
- ❖ National Cancer Institute (NCI)
- ❖ National Institute of Neurological Disorders and Stroke (NINDS)
- ❖ National Institute on Aging (NIA)
- ❖ National Institute on Mental Health (NIMH)
- ❖ National Institute of Alcohol Abuse and Alcoholism (NIAAA)
- ❖ NIH Fogarty International Center
- ❖ National Institute on Drug Abuse (NIDA)
- ❖ Vaccine Research Center



Addressing Global Health Challenges Through Scientific Innovation and Biomedical Research: U.S.-Cuba Joint Scientific Meeting

February 14, 2024

Main Topics:

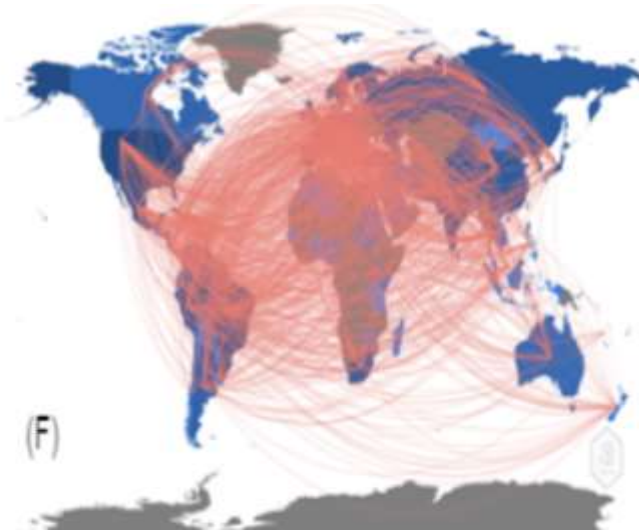
- ❖ Arbovirus Countermeasures
- ❖ Basic Research for Pandemic Preparedness
- ❖ Basic Immunology
- ❖ COVID-19 Attacks on the CNS
- ❖ Genomics and Genetics
- ❖ Precision Medicine
- ❖ Neuroinformatics and Brain Mapping Through AI
- ❖ Cancer
- ❖ Cardiometabolic and Chronic Disease
- ❖ Aging
- ❖ Ataxias and AD



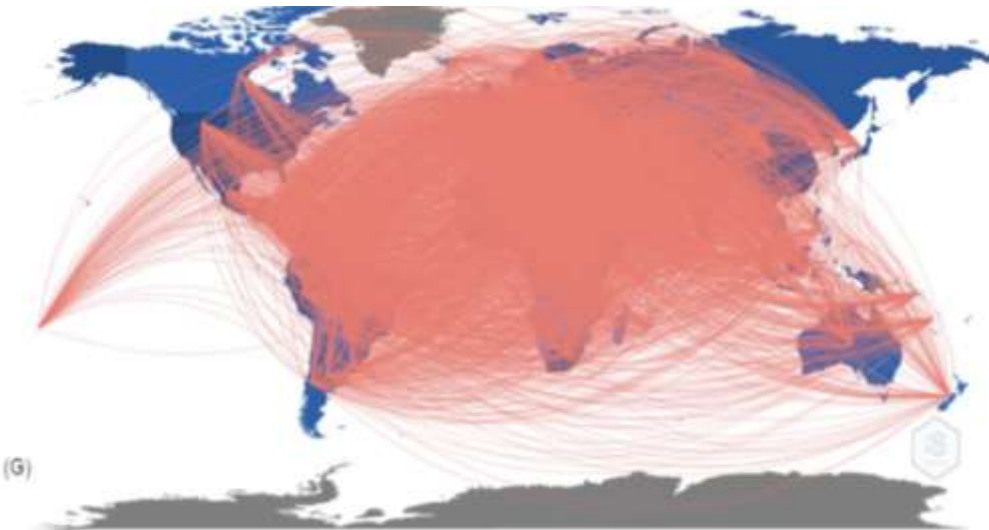
The evolution of the Cuban Scientific International Collaboration Network



(E) Cuban collaboration network after Bill Clinton's p2p approach in 1999.



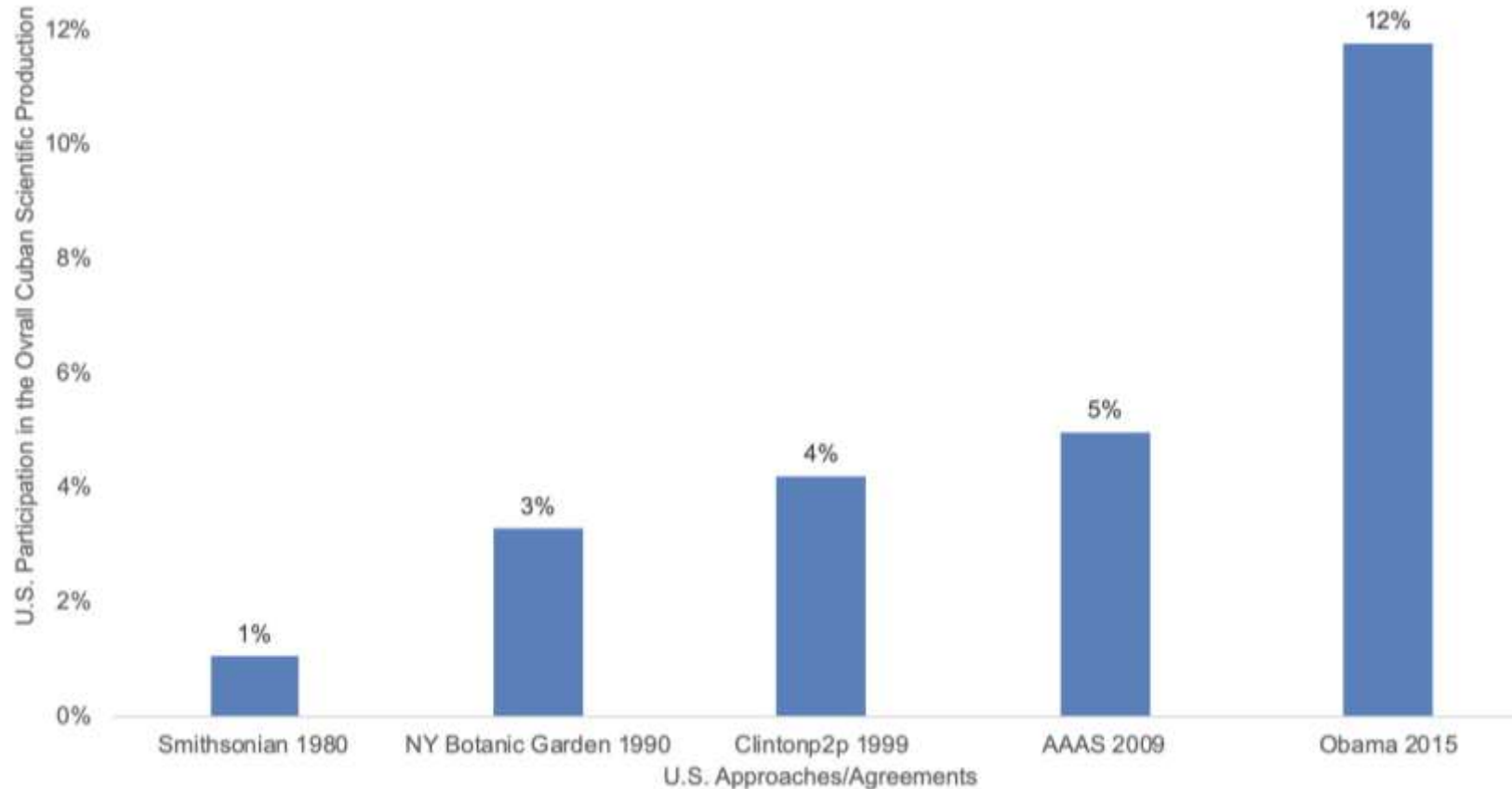
(F) Cuban collaboration network after the visit of U.S. science leaders of the AAAS in 2009.



(G) Cuban collaboration network after the Obama approach in 2015.

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The Percent of the U.S. Scientist's Participation in Overall Cuban Scientific Production



Increase in scientific production of US and Cuban scientists in WoS and Scopus. The largest increase was in 2015, during Barack Obama's approach to the normalization of diplomatic relations. Cuban scientific production in cooperation with US scientists doubled in comparison with the previous stage.

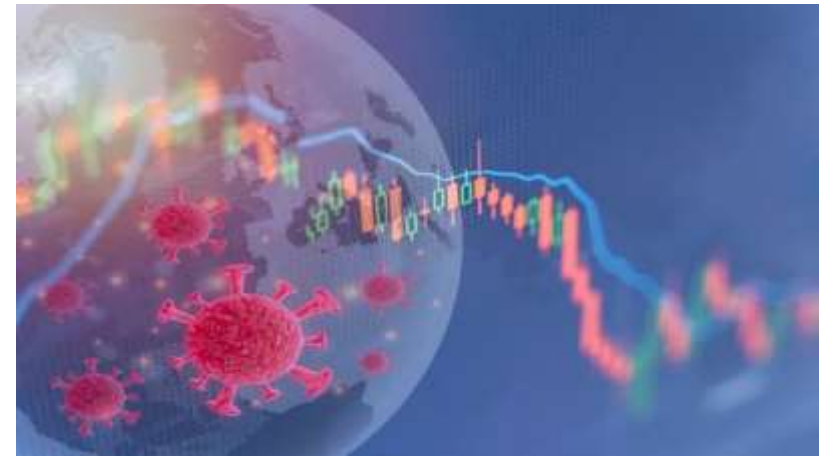
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- ❖ **Cuba and USA: Global Challenges**
- ❖ Strengths of the Cuban Science System

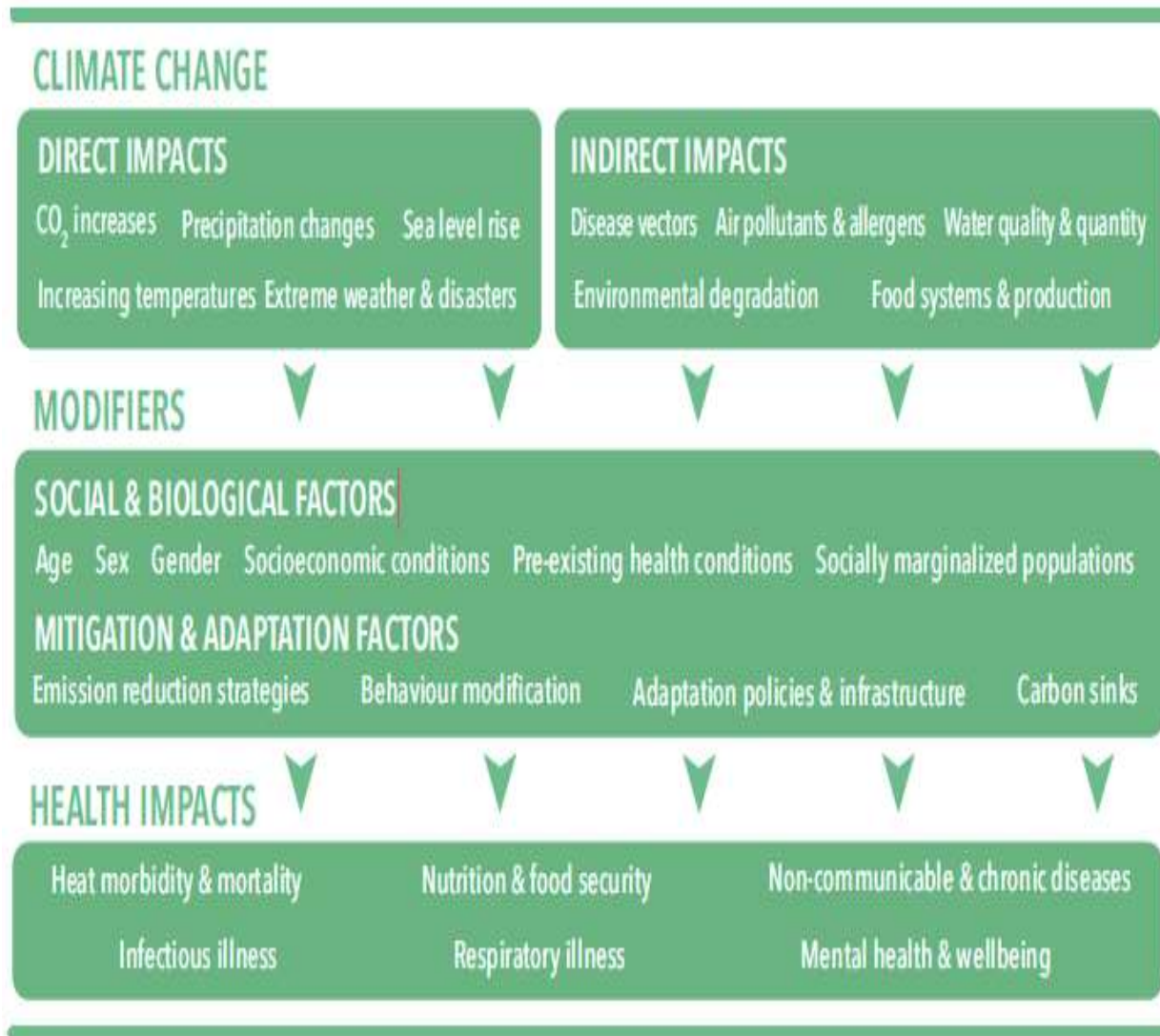
Humanity is facing major global challenges

- Sanitary and environmental crises
- Population aging
- Air pollution
- Food insecurity
- Inflationary economic problems
- War conflicts
- Increasing of neurodegenerative diseases
- Mental disorders
- Others

The American continent is one of the most affected regions in the world. Many subjects death due to chronic non-communicable diseases that could have been prevented.



Climate change effects on human health



- In 2019, air pollution led to 6.67 million premature deaths worldwide and for 206,000 deaths in the Americas
- 70% are due to non-communicable diseases: heart disease, stroke, chronic obstructive pulmonary disease, lung cancer, diabetes, etc
- Premature birth and low birth weight in infants

Increasing Extreme Weather



Cuba and the United States geographically share the Strait of Florida and the Gulf of Mexico as common maritime areas.

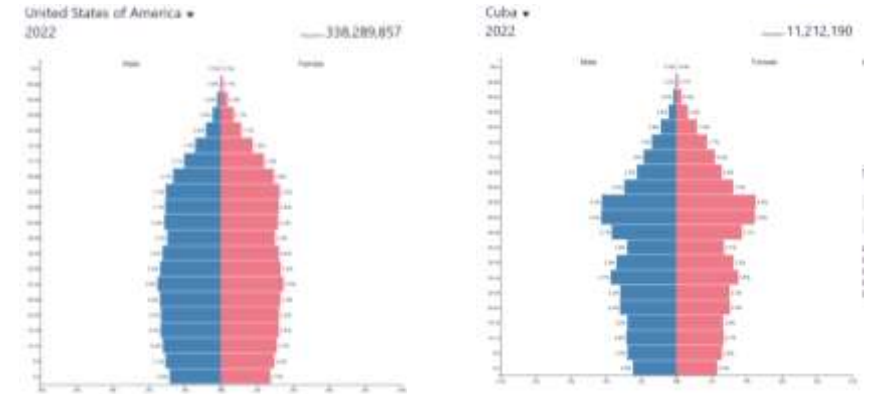


The monitoring and prediction of coastal flooding to strengthen early warning systems for these extreme weather events is a collaborative issue.



Health Shared challenges

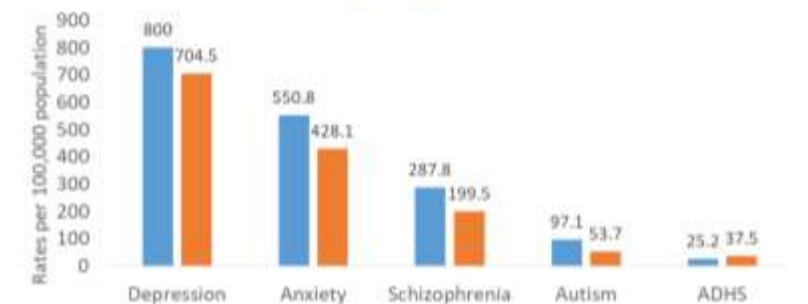
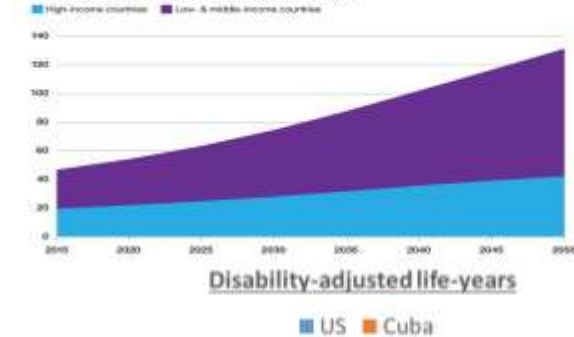
- ❖ The population over age 60 in Cuba and the US is 20%.
- ❖ The prevalence of Alzheimer's disease is expected to increase in Cuba by 124% and in US by 100% in 2050.
- ❖ Dementia is currently the seventh leading cause of death and one of the major causes of disability and dependency among older people globally.
- ❖ The rate from neurological disorders in Cuba and the United States ranges from 30 to 47 per 100,000 population.
- ❖ Cerebrovascular diseases are between the first cause of death in Cuba (3rd) and US (4th)
- ❖ 13 % of Global population is living with mental disorders (31% Anxiety and 29% Depressive disorders)
- ❖ Cancer: a shared health problem for US and Cuba



Alzheimer disease & other dementias

A Growing Health Crisis

The projected number of people with dementia, millions



www.populationpyramid.net
<https://www.paho.org/es/enlace/world-alzheimer-report-2022/>

Dengue: A common enemy for US and Cuba



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- ❖ **Strengths of the Cuban Science System**

Strengths of the Cuban Academy of Sciences (CAS)



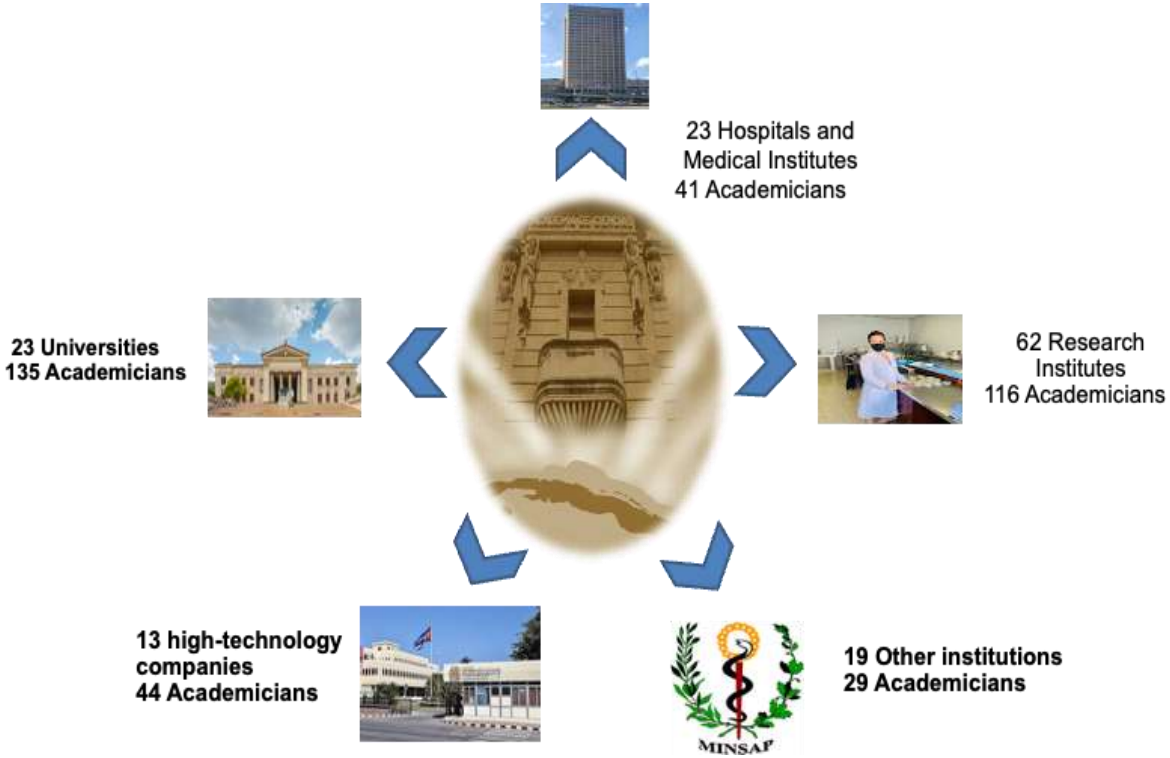
- ❖ CAS was the first national academy established outside of Europe.
- ❖ CAS is the largest national and multidisciplinary institution created in Cuba grouping the outstanding scientists
- ❖ There is a large representation of scientists from the US
- ❖ CAS is working together with AAAS on common objectives
- ❖ 34 % of Cuban Academy of Sciences members are women
- ❖ A Cuban young sciences academy is under foundation



Branches of the Cuban Academy of Sciences



Collaboration Network of the CAS



Science, Technology and Innovation Entities (More than 200)

- Research Centers
- Science and Technology Service Centers
- Development and Innovation Units (UDI)
- Science and Technology Parks (PCT)
- High Technology Companies (EAT)
- Interface Companies (EIF)
- Digital Innovation Laboratories



Strengths of the Science System in Cuba

❖ Human potential:

- 89,359 science workers (53% women)
- 8 501: Research assistants and senior researchers
- 19 402 Ph.D. and Dr. Cs.
- 1718 Technologists I and II
- 25,000 professors
- 500 academics (full, merit, honorary)



National Centers for Biomedical Research

Cuban Centre for
Neurosciences



International Centre for
Neurological
Restoration



Institute of Neurology
and Neurosurgery



Centre for Research and
Rehabilitation of Hereditary
ataxias



Centre of Genetic
Engineering and
Biotechnology



Centre of
Molecular
Immunology



Centre of Research and
Development of Drugs

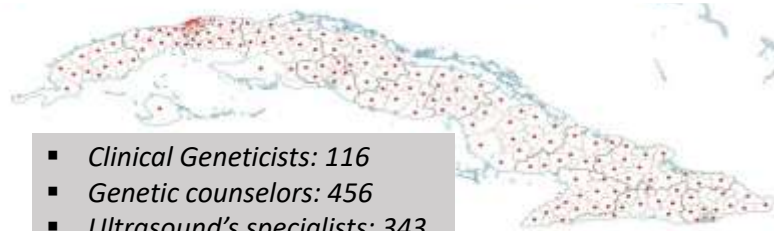


Havana University



Strengths of the Cuban Science System

Cuban Network for Communitarian Genetics



- *Clinical Geneticists: 116*
- *Genetic counselors: 456*
- *Ultrasound's specialists: 343*
- *Technicians: 152*

Cuban Network for Molecular Biology Laboratories



National Clinical Neurophysiology Network (N=40)



National Network of Diagnosis and Orientation Centers for school children (N=202)



National Hereditary Ataxias Network



National Network of Medical Universities



Universities by Province and Municipality University Centers

- ❖ Universidad Agraria de La Habana "Fructuoso Rodríguez", Mayabeque
- ❖ Universidad Central "Marta Abreu" de Las Villas (UCLV)
- ❖ Universidad de Artemisa (UA)
- ❖ Universidad de Camagüey "Ignacio Agramonte Loynaz" (UC)
- ❖ Universidad de Ciego de Ávila "Máximo Gómez Báez" (UNICA)
- ❖ Universidad de Cienfuegos "Carlos Rafael Rodríguez" (UCF)
- ❖ Universidad de Granma (campus en Bayamo y Manzanillo) (UDG)
- ❖ Universidad de Guantánamo (CUG)
- ❖ Universidad de La Habana (UH)
- ❖ Universidad de Holguín "Oscar Lucero Moya" (UHO)
- ❖ Universidad de Las Tunas "Vladimir Ilich Lenin" (ULT)
- ❖ Universidad de Matanzas "Camilo Cienfuegos" (UMCC)
- ❖ Universidad de Pinar del Río "Hnos Saíz Montes de Oca" (UPR)
- ❖ Universidad de Sancti Spíritus "José Martí Pérez" (UNISS)
- ❖ Universidad de Santiago de Cuba (UO)
- ❖ Universidad de la Isla de la Juventud "Jesús Montané Oropesa" (UIJ)
- ❖ Universidad de las Ciencias Informáticas, La Habana (UCI)
- ❖ Universidad Tecnológica de La Habana "José Antonio Echeverría" (CUJA)
- ❖ Universidad de las Artes, La Habana (ISA)
- ❖ **121 Municipality University Centers** (MES, MINED, INDER, MINSAP)



Final Messages:



- ❖ US–Cuba cooperation is essential. The Cuban and U.S. scientific communities share geographic proximity and common challenges, particularly in the areas of the environment, natural disasters, meteorology, and public health.
- ❖ Building bridges: Cuban and U.S. scientists can achieve important results that have impact beyond their own countries' borders.

*Thank you
so much*

