



**16vo Curso Internacional de Dengue, Zika y otros Arbovirus Emergentes
12 al 23 de Agosto de 2018
IPK, La Habana, Cuba**

**16th International Course on Dengue, Zika and other Emergent
Arboviruses
12 - 23 August 2019
Institute of Tropical Medicine “Pedro Kouri”, Havana, Cuba**

COURSE SUMMARY

The geographical expansion of *Aedes aegypti* and *Aedes albopictus* preceded dengue emergence due to the impact of increasing urbanization of the human population and climate, social and environmental changes. These conditions not only favored dengue expansion but also the emergence of chikungunya and Zika, as well as the re-emergence of yellow fever. The co-circulation of these arboviruses poses new challenges to global public health.

The PAHO/WHO Collaborating Center for the Study of Dengue and its Control of the Institute of Tropical Medicine “Pedro Kouri”/MINSAP, the Cuban Society of Microbiology and Parasitology, the Cuban Ministry of Public Health and PAHO/WHO among other institutions, organizations and scientific societies organized from 12 – 23 August 2019, the 16th International Course on Dengue, Zika and Other Emergent Arboviruses. As in previous occasions, the course was developed at the facilities of the Institute of Tropical Medicine “Pedro Kouri”.

Participants were updated on the regional and global arbovirus epidemiological situation, the clinic, laboratory diagnostic, vaccine development, the new tools for vector control, the surveillance, the emergency response, the new international initiatives among other interesting and important topics.

The course was a forum for the discussion and exchange of ideas and experiences on the most update information on Dengue, Zika, Chikungunya and Yellow fever including the new challenges and strategies for its control.

In this occasion, the course was organized in the framework of the 500th Anniversary of the “Villa San Cristobal de la Habana”.

The current edition was organized under the auspices of the Cuban Ministry of Health, the Cuban Society of Microbiology and Parasitology (SCMP), Pan American Health Organization (PAHO)/ World Health Organization (WHO), Cuban Academy of Sciences (ACC), American Society of Microbiology (ASM), American Society of Tropical Medicine and Hygiene (ASTMH), Asociación Latinoamericana de Inmunología (ALAI), Atlantic Philanthropies, Centro de Ingeniería Genética y Biotecnología (CIGB), European Society of Clinical Microbiology and Infectious Diseases (ESCMID), Fundación Mundo Sano, Institute of Tropical Medicine, Belgium, Labiofam, MedicubaEuropa, Neglected Tropical Disease Program (NTDP-WHO), Organización Internacional de Energía Atómica(OIEA), Special Programme for Research and Training in Tropical Diseases, TDR, and the research projects ZIKAlliance and ZikaPLAN.



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During the theoretical course (12-16 August), 25 lectures, 3 round tables, 7 symposia and 1 panel were developed (tables 1 and 2) updating the participants among the most important aspects on these arboviruses.

The practical course (August 19 to 23) allowed participants to debate important aspects on the clinic and pathology, diagnostic-immunology, vector-entomology, epidemiology, social determinants-community participation and for the first time in the course the use of SIT. Participants were grouped in six.

The practical group of epidemiology worked on the modeling of the dynamic of dengue (and other flaviviruses) transmission, the usefulness of Alert and Early response systems as well as the Cost Effectiveness estimations of the interventions against flaviviruses/arboviruses and vector control among other topics.

During the virology-immunology practices, the molecular diagnosis of arboviruses, the detection of dengue virus in several clinical samples including tissues as well as mosquito pools, the complexity of flavivirus serology and the usefulness of NGS for the genetic characterization of isolates were updated. Other topics were the study of activation markers expression of human monocytes for flavivirus pathogenesis research as well as the gene cloning.

The clinic of dengue, zika and chikungunya, the differential diagnosis, the usefulness of the warning signs for dengue, chronic chikungunya, the implications of the arbovirus infections during pregnancy were updated through presentations and case discussions at the clinic-pathology group.

The practices at the Entomology-vector control group included the identification of bacteria entomopathogens for the quality control of biolarvicides, Detinova technique (to determine the physiologic age of *Aedes aegypti*, and its relationship to dengue transmission and the effectivity of the vector control methods), the determination of *Aedes* vector competence for dengue viruses, *Ae. Aegypti* insecticide resistance and the use of MALDI-TOF for the identification of mosquito species.

Social determinants-community participation practices addressed on the methodological aspects to approach social determinants within the prevention and control strategies for dengue and other arboviruses. Practical examples were discussed.

A theoretical and practical course was developed under the auspices of the OIEA, with experts from de Italy, Brazil and Cuba as well as participants from Chile, Turkey, Mauritius, Greece, Sudafrica, Brazil and Cuba. The technological process was afforded with experiences exchange and equipment and procedures achievements. IPK labs for SIT were visited as well as the irradiation plant of the Centro de aplicaciones tecnológicas y desarrollo nuclear (Ceaden).

Also for the first time, a Videoconference on Clinical Dengue Management to clinicians of the Cuban Health System was developed on Thursday 15 at the HQ facilities of the Ministry of Health.

Finally, a poster session on August 14 and 15 allowed participants to share their results and experiences. In total, 36 posters were presented by participants from 12 countries (Austria, Belgium, Brazil, Canada, Colombia, Congo, Cuba, Germany, Mexico, Peru, Poland and USA).



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In the framework of the course, 2 expert meetings were organized:

- **TDR-CARPHA-IPK Workshop on Multisectoral approaches for prevention and control of Vector-Borne diseases in the Caribbean**, on August 8-9 with 21 participants from 16 Caribbean countries- The need and usefulness of the introduction of a multisectoral approaches on VBDs prevention and control and the best way to implement in the Caribbean countries were discussed.
- **Dentarget meeting**, on 17, 19 and 20 of August with 27 participants from 6 countries. Results from multicountries research focused on the identification of hot spots of arbovirus transmission for the design and evaluation of more efficient control interventions and early response were discussed.

240 participants, 128 from Cuba and 112 from 39 countries from the Americas, SEA, Europe and Africa. The biggest delegations were from Colombia (14), Argentine (9), USA (8), Aruba (8), Chile (7), Mexico (7) and Brazil and Peru with 6 students each. 50% of foreigner participants and the total Cubans attended both the theoretical and the practical courses.

Professors and speakers from prestigious institutions dedicated to Dengue, Zika, Chik and YF study attended the course, 51 from 14 countries and organizations and 77 professors and collaborators from Cuban institutions (see below)

In total, **368** specialists participated in some of the course and side activities, from them, 163 foreigners from 40 countries (Americas, Europe, South East Asia and Africa) and 205 Cubans.

Aliam labs solutions, Altona Diagnostics (GmbH), Bayer, Bio Lab International, Chemikon, Fitogranos (Ltda), Mikrogen and Takeda, collaborated for the well execution of the course

Figure records the number of participants (**3186** participants, **1533** Cubans and **1653** foreigners) and countries (79) since the first dengue international course edition in 1987 (1987-2019).

The Organizer Committee of the 16th edition of the Dengue International Course thanks all participants, professors, institutions, scientific societies and organizations for their collaboration in the well execution of the course. The 17th edition will be held on August 2021.

At <http://instituciones.sld.cu/ipk/> you can find more information including the programme, photos and main lectures



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PROFESSORS & FOREIGN SPEAKERS

Mayra Aguiar, Universidad Trento

SylvainAldighieri, OPS/OMS

Kevin Arien, Instituto de Medicina Tropical de Amberes, Bélgica

FabrizioBallestrino, OIEA, Italia

KoenBarrholomeeusan, Instituto de Medicina Tropical de Amberes, Bélgica

Gilberto Beitia, BioLab SA

Haroldo Bezerra, OPS/OMS

Mabel Carabali, Universidad de McGill, Canadá

Fabio Castello Branco, FIOCRUZ, Brasil

AzaelChe, UADY, México

Chong Chee Seng, NEA, Singapur

Kay Choi, UTMB, EUA

Alex Cook, NUS, Singapur

Mustapha Debboun, Harris County Public Health, EUA

Delia Enria, Argentina

Florence Fouque, TDR-WHO

Leticia Franco, OPS/OMS

Mariano A. Garcia-Blanco, UTMB, EUA

Maylen Gómez, Brazil

Luis Gutiérrez, OPS/OMS

Lee Han-Jung, TAMU, EUA

Nildimar Honorio, Instituto FioCruz, Brazil

Olaff Horstick, Heidelberg University, Germany

Hans Kuhn, AltonaDiagnostics, Alemania

Xavier de Lamballerie, Universidad de Aix-Marsella, Francia

Linda Lloyd, EUA

Felipe Lorenzato, Takeda

Kleber Luz, Universidad Federal Rio Grande Du Norte, Brasil

Pablo Manrique, UADY, México

Jairo Méndez, OPS/OMS

José Moya, OPS, Cuba

Jorge Osorio, Universidad Wisconsin, EUA

Christopher Oxenford, OMS

Carlos Pardo, Johns Hopkins Neurology, EUA

Andre Rivas, Facultad Medicina Campinas, Brasil

Raúl Rojo, Secretaría Salud, Medellín, Colombia

Karen Rottengatter, Altona Diagnostics, Alemania

Guillermo Rua, Universidad Antioquia, Colombia

PhilippeSelhorst, Instituto de Medicina Tropical de Amberes, Bélgica

Aravinda de Silva, Universidad Carolina del Norte, EUA

FabriceSimon, LaveranMilitaryTeaching Hospital, Francia

JiarenSun, UTMB, EUA

VeerleVanlerbergue, Instituto de Medicina Tropical de Amberes, Bélgica



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Xaveer Van Ostade, University of Antwerp, Bélgica

WimVandenBerghe, University of Antwerp, Bélgica

NikosVasilakis, UTMB, EUA

Gonzalo M. Vazquez-Prokopec, EmoryUniversity, EUA

Anubis Vega, Instituto Pasteur, Guadalupe

RamanVelayudhan, NTDP, OMS

Tian Wang, UTMB, EUA

Scott Weaver, UTMB, EUA

Ping Wu, UTMB, EUA

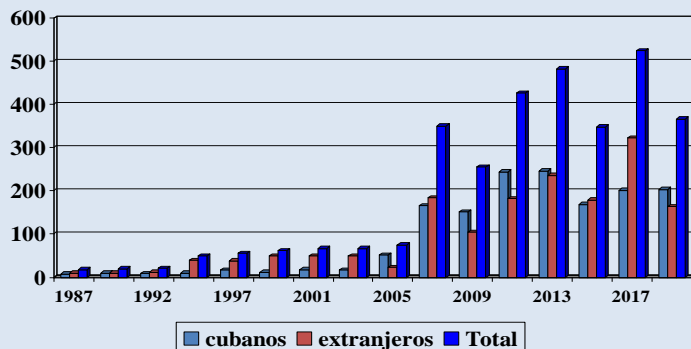
CUBANS PROFESSORS AND SPEAKERS

María G. Guzmán, Eric Martínez, María E. Toledo, Juan Bisset, Susana Vázquez, Mayling Alvarez, Ana B. Pérez, Beatriz Sierra, Rosa Ramírez, Didye Ruiz, Daniel González, Omar Fuentes, María Magdalena Rodríguez, Alberto Baly, Francisco Zamora, María del C. Marquetti, Dennys Pérez, Martha Castro, Osvaldo Castro, Manuel Romero, Pedro Más, Domingo Montada, Lázaro Gil, Alicia Reyes, Aileen Gonzalez, Ariamys Companioni, Maureen Leyva, Rene Gato, Roberto A. Fumero, Natividad Hernández, Yisel Hernández, Gladys Gutierrez, José Luis Pelegrino, Lizette Gil, Mayra Muné, Misladys Rodríguez, Emidalys Santana, Dailin Medero, Maria Karla Martínez, Aina Méndez, Claudia Bracho, Naifi Calzada, Narciso A. Jiménez, Jenny Peraza, Luis Augusto Piedra, Armando Esquivel, Yanet Martínez, Yanisley Martínez, , Jorge Anaya, Maria del Carmen Zabala, Waldemar Baldoquin, Angel German, Dayana Rodríguez, Héctor Cruz, Ariel Palenzuela, Adolfo Álvarez, Mayelin Mirabal, Reinaldo López Barroso, Ana M. Ibarra, Gilberto Zamora, Iris Valdés, Carilda Peña, Francisco Duran, Araiza Consuegra, Olivia Tejeda, José F. Sabatier, Sonia González, Carlos Sebrango, Vivian Huerta entre otros prestigiosos profesores y colaboradores del Instituto de Medicina Tropical “Pedro Kouri” (IPK), Centro de Ingeniería Genética y Biotecnología (CIGB), Universidad de la Habana, Universidad Martha Abreu de Villa Clara, Universidad de Sancti Spiritus, Centro de Inmunoensayo (CIE), Instituto Nacional de Higiene Epidemiología y Microbiología (INHEM), Hospital Hermanos Ameijeiras, Flacso, Instituto Finlay de Vacunas, Hospital Aballi, Ministerio de Salud Cuba.

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Figure. Total of participants at the dengue international course by year (1987-2019)

***Curso Internacional de Dengue,
1987-2019, Habana, Cuba
Dengue International Course
1987-2019, Havana, Cuba***



Cubanos/Cubans: 1533
Extranjeros/Foreigners: 1653
Total: 3186
79 países/countries

- | | | |
|-------------|-----------|----------------|
| Angola | Finlandia | Panamá |
| Argentina | France | Paraguay |
| Aruba | Grecia | Peru |
| Australia | Germany | Polonia |
| Austria | Granada | Portugal |
| Bahamas | Guatemala | P. Rico |
| Barbados | Guyana | Rusia |
| Belgium | Guadalupe | San Kits/Nevis |
| Belice | Haití | Singapur |
| Bolivia | Holanda | Spain |
| Brasil | Honduras | Sri Lanka |
| Cabo Verde | India | Sta Lucia |
| Caiman I. | Indonesia | Sr Vincent |
| Cambodia | Irlanda | Sudáfrica |
| Canadá | Italia | Suecia |
| Chile | Kenya | Suiza |
| Colombia | Korea | Surinam |
| Congo | Jamaica | Tailandia |
| C. Rica | Japón | T. Tobago |
| Cuba | Malaysia | Turquia |
| Curazao | Martinica | UK |
| Dominica | Mauricio | Uruguay |
| Dom. Rep. | México | USA |
| Ecuador | Nicaragua | Venezuela |
| El Salvador | Nigeria | Vietnam |
| Etiopia | Noriega | |
| Filipinas | Pakistán | |

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Table 1. Round tables and panel, dengue course, 12-23 August 2019.

The clinic of dengue, zika & chikungunya.	Daniel González , IPK, Cuba, Kleber Luz, Federal RGN University, Brazil, Fabrice Simon, Hospital Militar, Marseille
Dengue, chikungunya & zika. Lessons	Oswaldo Castro , IPK, Cuba, Carlos Pardo-Villamizar, J. Hopkins University, USA, André Rivas , Facultad Medicina, Campinas, Brazil
Consequences of zika & chikungunya infections.	Xavier Lamballerie , University of Aix-Marseille, France Carlos Pardo-Villamizar, J. Hopkins University, USA Fabrice Simon, Hospital Militar, Marseille, France
Social determinants of diseases transmitted by <i>Aedes aegypti</i> (panel)	Moderators: Dennis Pérez, IPK, Cuba, Linda Lloyd, USA

Table 2. Symposia at the dengue course, 12-23, August, 2019.

Aspects of dengue & Zika pathogenesis	Chairs: Ana B. Pérez, IPK, Cuba and Xavier Lamballerie, University of Aix-Marseille, France
Advances in vaccines for dengue, zika & chikungunya	Chairs: María G. Guzmán, IPK, Cuba and Scott Weaver, UTMB, USA
Vectors of emergent arboviruses & their control	Chairs: María del Carmen Marquetti, IPK, Cuba and Haroldo Bezerra, PAHO
National and International initiatives for facing arbovirosis	Chairs: José L. Pelegrino, IPK, Cuba and Jairo Méndez, PAHO
Advances and challenges of the diagnosis of emergent arboviruses (under the auspicious of ASM)	Chairs: Mayling Alvarez, IPK, Cuba and Leticia Franco, PAHO
OMICS approaches to host flavivirus interaction	Chairs: Beatriz Sierra, IPK, Cuba and Xaveer Van Ostade, University of Amberes (UA), Belgium
Innovative strategies for arbovirus control	Chair: María E. Toledo, IPK, Cuba



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AUSPICIES

Instituto de Medicina Tropical, “Pedro Kouri”, IPK, La Habana

Sociedad Cubana de Microbiología y Parasitología (SCMP)

Ministerio de Salud Pública de la República de Cuba (MINSAP)

Organización Panamericana de la Salud (OPS)/Organización Mundial de la Salud (OMS)

Academia de Ciencias de Cuba, ACC

Institute of Tropical Medicine, Belgium

American Society of Microbiology, ASM

Labiofam

American Society of Tropical Medicine and Hygiene,
ASTMH

MedicubaEuropa

Asociación Latinoamericana de Inmunología, ALAI

Neglected Tropical Disease Program, NTDP, WHO

AtlanticPhilanthropies

Organización Internacional de Energía Atómica (OIEA)

Centro de Ingeniería Genética y Biotecnología, CIGB

Special Programme for Research and Training in
Tropical Diseases, TDR

European Society of Clinical Microbiology and Infectious
Diseases, ESCMID

ZIKAlliance

Fundación Mundo Sano

ZikaPLAN



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Collaborators

Aliam, labs solutions
AltonaDiagnostics (GmbH)

Bayer

BioLab International

Chemikon

Fitogranos (Ltda)

Mikrogen

Takeda

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