

PROJECT PGTF.

THE PEREZ-GUERRERO TRUST FUND FOR ECONOMIC AND TECHNICAL COOPERATION
AMONG DEVELOPING COUNTRIES

**Scientific-Technical Observatory on Vaccines
(VaCyT)**

2015

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1. Basic project information

The Scientific-Technical Observatory on Vaccines (VaCyT) is a project that aims the surveillance, analysis, mapping and generation of indicators in vaccines for the benefit of the entire regional community. This requires developing a service that can process large volumes of data and turn it into useful knowledge for decision-making (intelligence). The VaCyT will be part of the Latin American Network of Scientific and Technical Information on Vaccines that already has the Vaccine Virtual Library (VVB), the Vaccine Virtual Classroom (VVC) and the specialized VacciMonitor magazine.

The project was approved in September 2011. Its financial performance started in 2014. From November 2014 to December 2015, we have worked in the following actions:

1. Methodological and conceptual design including the sources, indicators, software and experts
2. To study and implement information retrieval systems from scientific-technological databases
3. To study and implement data and text mining algorithms including data normalization.
4. To arrange the first meeting with VaCyT experts and developers to expose and discuss the system specificities
5. To design the software for the automatic generation of indicators (based on visualization techniques of metric information).
6. Diffusion of the project and feedback

2. Progress in project implementation

The outputs and indicators of the project are:

Articles

1. Le Thuy Nguyen, Maria E. Sarmiento, Romel Calero, Frank Camacho, Fatima Reyes, Murad Hossain, Gustavo Sierra, Mohd Nor Norazmi, Armando Acosta. Immunoinformatics study on highly expressed Mycobacterium tuberculosis genes during infection. Tuberculosis. 2014, Volume 94, Issue 5, Pages 475-481.
2. Raúl Isea. Predicción computacional cuantitativa de epítomos de células B. VacciMonitor. Vol. 24, Núm. 2 (2015). Mayo.-ago.

3. R Isea. The Present-Day Meaning Of The Word Bioinformatics. Global Journal of Advanced Research. 2015. 2(1), 70-73
4. O Ilzins, R Isea, J Hoebeke. Can Bioinformatics Be Considered as an Experimental Biological Science? Open Science Journal of Bioscience and Bioengineering. 2 (5), 60-62
5. Duran, O.; Guzmán, MV. Sistemas de información de hospitales. Un acercamiento a su uso en instituciones del área metropolitana de San Salvador. Revista Científica No. 09, Marzo 2015 (UDB). 17 Marzo del 2015.
6. Amin N, Pupo M, Aguilar A, Vázquez S, Caballero Y, Ochoa R. Recognition of a multiple antigen peptide containing sequence from mimotope of the denguetype 3 virus NS4B protein by human antibodies, Asian Pacific Journal of Tropical Medicine (2016), doi:10.1016/j.apjtm.2016.01.019.
7. Díaz Pérez, M.; Giráldez, R.; Guzmán, MV; Carrillo, H. PATENTOMETRIC ANALYSIS ON TUBERCULOSIS VACCINES. Asian Pacific Journal of Tropical Medicine. (enviado a publicar), 2016.

International conferences

8. Alvarez, I.; Guzmán, MV.; Calero, R.; Bouza, R.; Macías, Y.; Licea, E.; Araujo, JC. Análisis de la idoneidad de la virtualidad de los recursos con fines educativos y de difusión del conocimiento. VII Encuentro de Bibliotecas en Tecnologías de la Información y las Comunicaciones. Colombia, julio del 2015.
9. Elio Villaseñor, INFOTEC, México. (Participante del proyecto parte mexicana). Conferencia: "Big data analytics con tecnología de redes sociales". Lugar: Instituto Finlay de Vacunas, 17 de noviembre, 2015.
10. Ochoa, R. Incidencia de enfermedad meningocócica por el serogrupo B, una mirada desde la prevención. 27 Jornada Pediátrica de Actualización. Cali, Colombia. Marzo 2015.
11. Ochoa, R. Experiencia cubana para el control de las meningitis bacterianas. III Congreso Internacional de Inmunizaciones. Medellín, Colombia. Septiembre 2015.
12. Ochoa, R. (Ediciones Finlay - Comité Organizador). Apoyo a Congreso. Segundo Congreso Latino-Americano sobre Métodos Alternativos en los Ensayos, la Investigación, la Industria y la Educación COLAMA 2015. Sociedad Cubana de Farmacología y Red Latino-Ibero-Americana de Métodos Alternativos. Meliá Marina Varadero, Balneario de Varadero, Cuba. 5-9 de Julio, 2015. Sitio Web: <http://www.colamacuba.com>

13. Comité Organizador. III International Congress on Immunopharmacology (IMMUNOPHARMACOLOGY 2015), III International Congress on Pharmacology of Vaccines (VACCIPHARMA 2015). Cuban Society of Pharmacology. Meliá Marina Varadero, Varadero Beach, Cuba. June 14-19, 2015
14. Guzmán, MV. La Información Métrica para la Toma de Decisiones en Organizaciones Científico-Tecnológicas. Taller de Inteligencia Empresarial. IMAC. México, Septiembre del 2015.
15. Taller de apoyo tecnológico al Nodo Cuba del CVSP. Campus Virtual de Salud Pública. LUGAR: Escuela Nacional de Salud Pública. 13-17 de julio 2015.

Expert meetings and stays of project participants.

16. Dr. Humberto Carrillo Calvet. México. Reunión 14 de Julio del 2015. Lugar: Instituto Finlay. Subject: Desarrollo actual del proyecto y transferencia de los nuevos módulos (aplicaciones) desarrolladas por la parte cubana.
17. Ing. Edgardo De Gracia e Ing. Johel Díaz Pérez. Panamá. Taller Junio 2015. Lugar: Instituto Finlay. Subject: Plataformas virtuales. Presentes médicos y expertos en vacunología.
18. Meeting with Gabriel Listovsky, coordinator of the Regional Node of the CVSP (PAHO). Expert Meeting. Site: Instituto Finlay. 4 de marzo del 2015.
19. Participación en el X Taller del Campus Virtual de Salud Pública. Comisión Tecnología. Lugar: Biblioteca Médica Nacional. La Habana, 19 de noviembre de 2014.



Photo. Technology Commission session PAHO.

20. Estancia de: DrC. Maria Victoria Guzmán y MSc. Romel Calero de Instituto Finlay Lugar Universidad Nacional Autónoma de México. 2013. Tema: Participación en Taller de expertos y visita de intercambio para el desarrollo de las aplicaciones de Bioinformáticas.
21. Elio Villaseñor, INFOTEC, México. (Participante del proyecto parte mexicana). Desarrollo de algoritmos basados en SOM. Lugar: Instituto Finlay de Vacunas, 15-18 de noviembre, 2015.

Thesis

22. Campuzano, E. Diagnóstico y Propuesta de una Estrategia de Comunicación Interna. Tutores: Guzmán, MV.; Gutiérrez, O. Universidad de La Habana. (Tesis de licenciatura). 2014.
23. Piñon Lora, Maybel. Análisis y visualización de las estrategias de investigación científica en el sector biofarmacéutico cubano a partir de las redes de colaboración. Tesis de Maestría en Gestión de Información en las Organizaciones. Cátedra UNESCO. Octubre del 2015. Tutora: DrC. Maria Victoria Guzmán.

24. Yanet Cadalzo Díaz. Propuesta de procedimiento para la Vigilancia Científico-Tecnológica en la gestión de proyectos de I+D. Tesis de Maestría en Gestión de Información en las Organizaciones. Cátedra UNESCO. Tutora: DrC. Maria V.Guzmán. Junio del 2015.

Development and implementation of platforms, indicators and algorithms

Four main lines of the project were worked, all linked to the activities plan. These will contribute to the VaCyT, as well as other projects of information analysis and visualization of interest to develop business intelligence. Specifically, these lines are:

1. *Analyze the forming process of the biomedical sector within a national scientific and technological system with socio-economic changes (formation of the Scientists and Biotechnological Poles)*

Objectives: a) to understand the behavior patterns of scientific development in the region, from special socio-economic conditions; b) to identify and evaluate indicators of productivity, collaboration, leadership and innovation in biomedicine, especially high-tech thematic areas; c) to identify and characterize the analyzed knowledge domains and info metric maps based on Self Organizing Maps (SOM) variations

Expected results of the Plan: a) to identify behavior patterns; b) to provide information on the reference terms of the indicators thresholds about the scientific performance of Latin American researchers and their international comparability; c) to provide key elements to decision makers, which can influence the scientific and technological development of a country.

2. *Create the standardized domains bank (scientific and technological databases) to the biomedicine study in Mexico and Cuba, which contribute to VaCyT.*

Objectives: a) to support the structuring and implementation of the Science and Technology Observatory to organize, plan and evaluate the research done in vaccines and related issues at the regional level; b) to study the scientific development in the vaccines field in Latin America

Expected results of the Plan: a) contribute to strengthening regional capacity for the generation and use of indicators to guide national and regional policies; b) to create a database and knowledge to obtain several articles and book chapters that help VaCyT purposes. c) The strategic report on vaccines indicators available to the national science and technology agencies and the international scientific community

3. *Study other algorithms (not SOM) and computational tools for the analysis of large data sets.*

Objectives: a) contribute to the development of methodologies and technological platforms that can be transferred to other knowledge areas (not only vaccines); b) to generate and visualize scientific-technological indicators more complex (three-dimensional)

Expected results of the plan: New algorithms for Data Mining available to the academic community and to the development of new applications aimed at training students (master's and doctoral thesis) and scientific publications

2. Implementation problems

	<u>Obstacle identified</u>	<u>Action</u>
1.	The merger of Bio molecular Chemistry 1. Center and Finlay Institute occurred in December 2014. It was necessary to re-2. organize the work priorities and re-locate the staff.	Improve coordination from the human resources available at this time Training to new staff on work platforms and development of participant's project
3.	Response of counterparties to specific 1. tasks (e.g. systems migration). That is why the Observatory web site has not 2. been published and has not obtained the desired diffusion.	Setting the schedule depending on the results and to publish the website Include the Observatory on Vaccine in the Biotechnology Latin American Network and to share the project with other institutions, networks and international organizations, which can promote the skills creation and scientific exchange in the Vaccinology field
3.		Insert the project within a strengthened information system and with regional projection as BIREME / PAHO

4. Compliance status of the implementation schedule

No.	Indicators	Semesters:						Observations
		I	II	III	III	IV	IV	
		P1	P2	P3	P4	P5	P6	
1.1 a 1.5	Number of generated technical documents	80%	10%					Technical documents related to the software specifications and VaCyT design
1.6 a 1.13	Percent in the developed software		80%					1) 80% of the software specifications were completed 2) running algorithms of information filtrates 3) generating at least six indicators
2.1 a 2.3	Number of countries that that have received the software package and manual			10%				Software package that includes: 1) software manual and 2) Software: Delivery guarantee to the user
2.4	Number of trained human resources				20%	20%	20%	Number of people trained in issues associated with VaCyT during project implementation

2.5 a 2.6	Links inserting on sites of international organizations							Visible links on official sites such as PAHO, UNDP, scientific societies and other Observatories of the region
2.5 a 2.11	Implementation percent of the VaCyT portal harmonized with the rest of the network							Web Portal visible from several countries in the region
2.12 a 2.14	Number of certification evidences							1) Registration in the National Copyright Office (CENDA) 2) Guarantee issued by WHO 3) Insertion of VaCyT on the WHO web site

5. Project Performance - Progress degree towards achieving results

Annual Goal (2015): Development of computer platform specifications and competence building to obtain science and technology indicators

Compliance with 2015 goal: Fulfilled

Progress degree in the result contributing:

- Positive change**
- Negative change
- Without change