CURRICULUM VITAE

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| D:\vicente\vicente-14\personales\foto-VVB.png | **Professor Dr. Vicente Verez Bencomo**Date and place of Birth: 25 june 1953, Havana.Nationality: cubanHome address: calle 21 No 21416 e214 y 216, Atabey, Ciudad Habana, CUBA.Academic formation:  a) Chemical Engineer and Master in Science degree, Moscow Institute of Fine Chemical Technology, Moscow, 1977.  b) State Doctor (Ph D), University of Orleans, France, 1983 |

Dr Verez Bencomo is a chemist dedicated to understand the molecular basis of protection from infectious disease and to use this knowledge for the development of vaccines. He led this development from bench to introduction into preventive medical practice. The first vaccine was Quimi-Hib, a conjugate vaccine against *Haemophilus influenza* type b (Hib) using for the first time a synthetic carbohydrate antigen. Quimi-Hib is preq ualified by the World Health Organization since 2006. He also led the development of Quimi-Vio, a conjugate vaccine including the most prevalent Streptococcus pneumoniae serotypes actually in the last clinical steps before commercial introduction in Cuba. In the period 2020-2021 during the COVID19 pandemic, he also led the development of a series of vaccines later call SOBERANAS. SOBERANA 02 is based on previous development of conjugate vaccine for children and implies in this case not a carbohydrate but rather the development and use of a viral protein antigen. The safety record of this vaccine platform allowed a quick introduction in children in Cuba as early as September 2021. Cuba was the first country in the world that vaccinated against COVID19 all the pediatric population from 2 to 18 years.

Among the most important distinctions are: Tech museum award on health from San Jose California in 2005, the gold medal of the World Intellectual Property Organization (2005), Doctor ¨Honoris Causa¨ Université de Québec au Montréal (UQAM), Montréal, Canada (2009), Honorary Member of the Cuban Academy of Sciences (2007), Member of the Third World Academy of Sciences (2009), the most prestigious recognition from France: “Knight of the Legion of Honor”, (2015), Doctor ¨Honoris Causa¨ Universidad de la Habana (2021), Cuba “National Hero” (2021).

Invited lecturer in more than 20 National or International Symposiums, author and coauthor of more than 125 scientific publication including a publication in Science, 125 posters or oral presentation in Symposiums and 5 patents the last awarded with the World International Patent Organization gold medal.

Previous positions:

Since 1984-1990 chief of the carbohydrate group, Faculty of Chemistry, University of Havana.

From 1984-1990 chief of the group of chemical Synthesis at the National Center for Bioproducts in Havana.

In 1990 both group merged and becomes the Laboratory of Synthetic Antigens, at the Faculty of Chemistry, University of Havana. Since 1990-2008 director of this laboratory.

2001-2008 the Laboratory became a Center for the Study of Synthetic Antigens

2008-2014 General Director of the Center for Biomolecular Chemistry from the merge of Center for Synthetic Antigens and Center for Pharmaceutical Chemistry.

2014-present General Director Finlay Vaccine Institute.

**Scientific Awards**

Cuban Academic of Science 1993, 1994, 1995, 1999 and 2004.

Carlos J Finlay distinction (1996).

Ministry of Science, Technology and environment 1999 and 2004.

Ministry of Higher Education 2003.

Gold Medal from the World International Patent Organization in 2005.

Tech Museum for innovation (San Jose, California) award in 2005.

Recipient of the XXX “William J Probst” lecture 2005.

“La Giraldilla” from the city of Havana 2005

Cuban National award on chemistry, 2006.

“Arango y Pareño” award from the economical society Friends from the Country” 2007

“Iberoamerican Organic Chemistry Society” award 2019

**Scientific Organization Membership**:

-Cuban Academy of Science (Full member 1998-2002; 2003-2006)

Since 2006 emeritus member

-Third world academy of Science (Full member since 2007)

 -Cuban Chemical Society.

-Biological Front (Academy of Science).

-President of the Carbohydrate section (Cuban Chemical Society).

-Cuban National representative at the International Carbohydrate Organization.

-Member of the Scientific Council, University of Havana.

-Temporary Adviser, World Health Organization

-Temporary Adviser, Panamerican Health Organization

-Médaille Montpellier Pole universitaire

-Docteur ¨Honoris Causa¨ Université de Québec au Montréal (UQAM), Montréal, Canada

Honorary member Latinoamerican glycobiology Society

Doctor ¨Honoris Causa¨ Universidad de la Habana,

Member of PAHO Advisory committee on Regional Platform for the production of vaccines and other platform.

**Visit to Universities and laboratories**

University of Orleans, France, two years, 1981-1983.

University of Paris-sud, France, november, 1987.

University of Paris-sud, France, sept, 1989.

University of Granada, Spain, july, 1995.

Institute of Organic Chemistry, Madrid, Spain, july, 1995.

University of Konstanz, Germany, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003.

University of Hamburg and University of Konstanz, july-september, 1997

University of Granada, july, 1997.

University of Ottawa, Canada, 1998, 2000, 2001.

RIVM, Netherlands, September, 2001.

University of Utrecht 2001.

Shemiakyn Institute 2004.

Russian Institute of Immunology 2004

Russian Institute of Organic Chemistry 2004.

Fundacion Instituto de Inmunologia de Colombia 2004

University of Indonesia and Jogyakarta 2004.

Bandung Technical Institute 2004.

Darmhais Hospital 2004.

University of Santiago de Compostela 2008

Invited lecturer

2004 International Chemical Conference, Havana, Cuba

Bio Bangaloore 2004, Bangaloore, India.

2005 229 th ACS meeting, San Diego, California

International Glicobiology Symposium, Boston, Masachusetts.

Frontiers in Chemistry, Stockholm, Sweden

Immunological society of Netherland, Utrecht, The Netherland

2006 International Carbohydrate Symposium, Vancouver, Canada

2007 International Symposium of Glycoconjugates, Cairns, Australia.

Alfred Benzon Symposium, Glycosylation and Therapeutics, Copenhagen, Din.

European Carbohydrate Symposium.

8th Annual meeting of Development countries vaccines manufacturer networks.

2008 Simposium Iberico de Carbohidratos, Santiago de Compostela, España

2010 Technicla Meeting of PAHO at the World Health Forum

2011 Simposium Rusia-India on glycoscience

1st Latinoamerican Symposium of Glicobiology, Oaxaca, Mexico

2012 Glycan Forum, Berlin, march

 Glycan array symposium, San Sebastian, Spain, July

 International Carbohydrate Symposium, Madrid, Spain, July

2013 2nd Latinoamerican Symposium of Glicobiology, Mexico-city

2014 International Carbohydrate Symposium, Bangalore, India

2018 International Carbohydrate Symposium, Lisbon, Portugal

2019 IV Simposio Iberoamericano de Quimica Organica, Cuba

**Books and monographs**

1. Introduction to Carbohydrate Chemistry , MES , 1983
2. A trip to the Molecular world, Editorial Cientifico Tecnica, 1985
3. Quimica de los Carbohidratos I, Editorial Cientifico Tecnica, 1987
4. Carbohydrate Vaccines, ACS Symposium Series, 2006,
5. Chapter 1 Synthetic Haemophilus influenzae type b vaccine.
6. Chapter 2 Carbohydrates and T-cell immunity
7. Glycosciences. Chapter 12.11 Carbohydrate-based polysaccharide vaccines
8. Royal Society of Chemistry, Special Periodical Report 2014. Antibacterial and antifungal vaccines based on synthetic oligosaccharides
9. Carbohydrates Chemistry: State-of-the-art and challenges for drug development4.4 Vaccines against bacterial phatogens

**Doctoral Thesis**

1-Synthesis of Mycobacterial leprae antigens, Jose R Mariño Albernas, 1990

2-Development of new spacers for the preparation of neoglycoproteins from synthetic oligosaccharides, Violeta Fernandez Santana, 1998

3-Synthesis of tumor-associated oligosaccharides of lacto-2 series as glycosides of azido-type spacer, Santiago Figueroa Perez, 1998

4-Synthesis of Human Blood group ABO oligosaccharides, Maria T. Campos Valdes, 1999.

5-Quantitative NMR spectroscopy for carbohydrate vaccines, Raine Garrido, 2013

**Patents**

1- Vicente Vérez Bencomo, Jose R Mariño Albernas, Violeta Fernandez Santana, Maria T Campos Valdes, M. Hernandez Rensoli, Carlos Perez Martinez, Carlos Alaez Verson, Jorge Sarracent Perez, Mario Herrera Montes de Oca, Procedure for the preparation and application of 8-hydroxyoctanal and their derivatives with oligosaccharides, 22 296, 1994, National Center for Bioproducts.

2-Vicente Vérez Bencomo, Ivan Chiu Machado, Odalya Madrazo Alonso, L. Alba Gutierrez, Yanet Almira Cruz, Yamila Lorenzo Acosta, Ribose derivatives for the synthesis of oligosaccharides of *Haemophilus influenzae* tipo b and methods for their preparation, 22,424, 1995, University of Havana.

3-Vicente Vérez Bencomo and Rene Roy, Oligosaccharide derivatives of ribose-ribitol-phosphate and vaccine that contained them, WO0116146. Granted in Cuba, Sudafrika, Iran, New Zeland, USA, Eurasia, Europe, Australia, China.

4- Derivatives of oligosaccharides from Bordetella Pertussiss as vaccines PCT/CU2019/050001.

Gold Medal from the World International Patent Organization in 2004.

4- Vaccine composition against SARS-CoV-2 virus base on RBD dimer and meningococcal B Outer membrane vesicle. Cuba 2020

5-Covalent conjugates of SARS-CoV-2 RBD to a protein carrier and vaccine composition containing it, Cuba 2020.

**List of papers**

1. Synthesis of 1,2-cis-substituted Glucosylglycerols, **Zhurnal Obshchei Khimii**, vol 49, 2148-50, 1979.
2. Selective benzylation of methyl 4,6-O- benzyliden --D-mannopyranoside, **Rev.Cubana Farmacia**, 1981, 15, 26-30
3. Synthesis of methyl 3-0-(  -D-mannopyranosyl)-  -D-glucopyranoside, **Rev. Cubana Farmacia**, 1981, 15, 164-8
4. Phase transfer benzylation of carbohydrates II. Synthesis of methyl 3-0-benzyl-4,6-0-benzyliden-  -D-galactopyranoside, **Rev.Cubana Farmacia**, 1981, 15, 169-73
5. Gas-chromatography analysis of the oligosaccharides present in *pisum sativum*, **Rev.Cubana Farmacia**, 1981, 15, 222-6
6. chromatography Determination of steroidal compound in solanum plants, **Rev.Cubana Farmacia**, 1981, 15, 247-251
7. Carbohydrates potentially antitumoral I. Alkyllthioglucosides, **Rev.Cubana Farmacia**, 1982, 16, 235-42
8. The synthesis of derivatives of 0--D-galactopyranosyl-(1-3)-0-(2-acetamido- 2-deoxy--D-galactopyranosyl)-L-serine and L-threonine , **Carbohydr.Res.***,*1982, 110, C9-C11
9. Synthesis of glycopeptides having clusters of 0-glycosylic disaccharide chains [-D-Gal-(1-3)--D-GalNAc] located at vicinal amino acid residues of the peptide chain, ***Carbohydr.Res*.,**1983, 116, C9-C12.
10. Diosgenin, chlorogenin and Isochiapagenin from Solanum Bahamense L., **Pharmazie** 1982, 37, 225-226
11. Use of selenium in Carbohydrate Chemistry: Formation of vinyl-Glycosides, **Synthesis**, 1984,134-5
12. Synthesis of methyl 3-0-( 2-0- -D-mannopyranosyl  -D-mannopyranosyl)--D-glucopyranoside, **Rev.Cubana Química**, 1983, 17, 36-9
13. 1,2-cis Glycosylation. Problems and solutions, **Rev.Cubana Farmacia**, 1983, 17, 40-54
14. 1,2-cis Glycosylation. Synthesis of -mannosides, **Rev.Cubana Farmacia***,* 1983, 17, 55-64.
15. Contribution of organic synthesis to the determination of human blood group MN specificity, **Red Cell Membrane Glycoconjugates and related markers** ed J.P.Cartron,P.Rouger,Ch.Salmon, Arnette, Paris 1983, 159-169
16. Synthesis of M and N active Glycopeptides. Part of the N-Terminal Region of Human Glycophorin A.,***Glycoconjugate J*.**,1984,1,5-8
17. Interaction of synthetic Glycopeptides carrying clusters of 0-glycosidic disaccharide chains [b-D-Gal-(1-3)-a-D-GalNAc] with -D-Galactose-binding lectins,**Glycoconjugate J.,**1984,1,73-80
18. Steroidal glycosides from *solanum havanense* Jacq, **Rev.Cubana Quimica**, 1986,2, II, 71-3
19. Synthesis of benzyl 3-0- benzyl -4,6-0-benzyliden- -D-galactopyranoside, **Rev.Cubana Quimica**, 1987,3,73-8.
20. Synthesis of disaccharides 2-acetamido-2-deoxi-3-0-- D-galactopyranosyl-D-galactose and D-glucose, **Rev.Cubana Quimica**, 1987,3,45-9.
21. An easy preparation of 2-deoxy-2-phtalimido--D-gluco- and -L-rhamno-pyranosides, **J.Carbohydr.Chemistry**, 1987, 6, 509-13.
22. Synthesis of allyl and benzyl 4-0-(3,6-di-0-methyl--D-glucopyranosyl) -2,3-di-0-methyl--L-rhamnopyranoside ,***Carbohydr.Res*.,**1987, 165, 197-206.
23. Synthesis of disaccharide 2-acetamido-2-desoxi-- D-glucopyranosyl-(1-3)-D-galactose, the postulate receptor of pneumococci, **Rev.Cubana Quimica**, 1987,3,1-6.
24. Chemical synthesis of an artificial antigen containing the trisaccharide hapten of *mycobacterium leprae*, ***Carbohydr.Res*.,**1988, 183, 175-82.
25. Inhibition studies of the specificity of the *Vicia graminea* lectin, **Lectins; *Biol.Biochem.,Clin Biochem***., 1985, 4, 447-57
26. Serologic demonstration of the activity of a Mycobacterium leprae antigen obtained by chemical synthesis, **Rev Cubana Med Trop**. 1989, 41, 10-7
27. Glycosides of monoallyl diethylenglycol. A new type of spacer group for synthetic oligosaccharides. **J.Carbohydrate Chemistry**, 1989, 8, 531-7
28. Synthesis of the tetrasacaride Lacto-N-neotetraosa, **Rev.Cubana Quimica**, 1992,6,1-6.
29. An n.m.r. and conformational análisis of the terminal trisaccharide from the serologically active glycolipid of Mycobacterium leprae in different solvents. **Carbohydr. Res.,** 1990, 200, 33-45
30. Glycosides of 8-hydroxi-3,6,-dioxaoctanal. A synthesis of a new spacer for synthetic oligosaccharides, **Carbohydr.Res**.,1991, 271, 263-7.
31. Ultramicroelisa para lepra con un antigeno sintetico. **Revista do Instituto de Medicina Tropical de Sao Paulo**, 1991, 33, 6, 491-5
32. Synthesis of the human blood group A trisaccharide with a dioxolane type spacer, **Revista Cubana de Quimica**, 1996, 8, 11-
33. Human Blood group B trisaccharide I. Synthesis , characterization and use for generation and selection of specific monoclonal antibodies, ***Biotecnologia aplicada*,** 1995, 12, 36-41
34. A new approach to the ribosyl-ribitol unit for the synthesis of Haemophilus influenzae type b oligosaccharides, **J. Carbohydr.Chemistry** , 1994, 13, 3, 465-74.
35. Synthesis of ribofuranosides by catalyst with Lewis acids. Glycosidation versus transacetylation, **J. Carbohydrate Chem**, 1995, 14, 551-561
36. Synthesis of the terminal disaccharides corresponding to Ogawa and Inaba antigenic determinant from Vibrio cholerae, **Carbohydrate Letters**, 1995,1, 173-178.
37. Synthesis of the trisaccharide -L-Rha-(1-2)--L-Rha-(1-2)--L-Rha with a dioxolane type spacer-arm, ***J. Carbohydr. Chem*,** 1996, 15, 137-146.
38. Synthesis of lex and ley oligosaccharides with azido-type spacer-arm. comparative use of 3- and 4-methoxybenzyl as a key temporal protective group, **J. Carbohydr. Chem***,* 1998, 16, 7, 835-850.
39. Conjugate vaccines using synthetic carbohydrate antigens : a tool for anti-tumor therapeutics vaccines, **Biotecnologia aplicada***,* 1997, 14, 56-7.
40. Synthesis of neoglycolipids containing man 3,6 branched oligosaccharides as a carbohydrate moeity, **J. Carbohydr. Chem.***,* 1998, 16, 7, 851-868.
41. Synthesis of the *vibrio* *cholerae* O1 Ogawa and Inaba terminal disaccharides with a dioxolane-type spacer and their coupling to proteins, **J. Carbohydrate Chem,** *1998, 17 (9) 1307-1320.*
42. Synthesis of terminal disaccharides corresponding to Ogawa and Inaba antigenic determinant from *Vibrio cholerae* O1, **Carbohydrate Res.** 1998, 306, 165-17
43. synthesis of inmunogens containing lewisa and lewisb haptens by the use of glycosides of 5-azido-3-oxapentanol, **Glycoconj J.,** 1998, 15, 549-553.
44. Synthesis and SOD-Like Activity of Monosaccharide Derived Thiosemicarbazones **Journal of Carbohydrate Chemistry**, 1998,17, 293 – 303
45. Galactosylation with -Galactosidase from Bovine Testes Employing Modified Acceptor Substrates, **Bioorganic and Medicinal Chemistry**, 1997, 5, 1285-1291
46. Effect of shape, size, and valency of multivalent mannosides on their binding properties to phytohemagglutinins, **Glycoconjugate Journal**, 1998, 15, 251-263.
47. Synthesis of new neoglycolipid (AgH-1) and its effect upon the properties of dipalmitoylphosphatidylcholine:cholesterol liposomes, **Archiv. Biochem. Biophys.,** 1998, 350, 137-47.
48. Aggregation induced by concanavalin A of lipid vesicles containing neoglycolipids, **Colloids and surfaces B: Biointerfaces 26(3):281-289**
49. Synthesis and NMR analysis of 13C-labeled oligosaccharides corresponding to the major glycolipid from Mycobacterium leprae, **Carbohydr. Res.,** 1998, 306, 493-503
50. Synthesis of dimeric Lewis X antigenic determinant with azido-type spacer arm by a sequence of regioselective glycosylation steps, **Tetrahedron Letters**, 1998, 9143-9146.
51. Synthesis of the amino spacered sialyl-α-(2→6)-lactosamine trisaccharide, **Carbohydr. Res**., 1999, 317, 29-38.
52. Solution conformation and dynamics of the trisaccharide fragments of the O-antigen of *Vibrio cholerae* O1, serotypes Inaba and Ogawa, ***Carbohydrate Research*** 1999, 321:*1-2*:88 – 95.
53. Synthesis of A Type 2 Tetrasaccharide with amino type spacer arm by Regio-Stereo Selective Glycosylation Strategy, **Carbohydrate Letters**, 1999, 3, 369-374.
54. Phase and surface properties of lipid bilayers containing neoglycolipids. **Arch Biochem Biophys**. 1999, 363(1):81-90.
55. Preparación de un inmunoadsorbente del grupo sanguíneo humano A para su uso en la purificación de hemoderivados, **Acta Farm. Bonaerense** 1999, 18 (3) 207-15.
56. Monosialyllactose neoglycoconjugates are not able to provide an immunological response against n-acetyl GM3 ganglioside in mice and chickens, **Biotecnolog. Applic**.2004, 21, 5-12.
57. Synthesis of Neoglycolipid Analogues of the Oligosaccharide Portion of Ganglioside GM3, J**. Carbohydr. Chem**., 2003, 22, 395-406
58. **A Synthetic Conjugate Polysaccharide Vaccine Against Haemophilus Influenzae Type b,** **Science, 2004, 305, 522-24.**
59. Immunogenicity and antigenicity of a synthetic *Haemophilus influenzae* type b oligosaccharide-protein conjugates, **Infection and Immunity**, 2004, 72, 7115-7123.
60. Método alternativo para la síntesis de una de las materias primas de la vacuna contra el Haemophilus influenzae tipo b, Revista Cubana de Química, 2005, 18, , 261
61. **Phase** **I** Evaluation of a conjugate vaccine containing fully synthetic *Haemophilus influenzae* type b oligosaccharides in Healthy Adults, **Clinical Vaccine Immunology**, 2006, 13, 1052-1056.
62. Polysaccharide-based vaccine, in **Glycosciences**, 2007, Ch75, pp 2699-2723
63. Development of Haemophilus influenzae type b conjugate vaccine with a synthetic capsular polysaccharide antigen. **ACS Symposium series** 2008, 989, 71-84
64. Glycoconjugate vaccines against *Haemophilus influenzae* type b. **Methods in Enzymology**, 2006, 415, 10, 153-163.
65. Enzyme-linked immunosorbent assay for quantitative determination of capsular polysaccharide in culture supernatants of Streptococcus pneumoniae, B**iotechnology Applied Biochem**, 2006, 44, 101-108.
66. T-cell immunity and carbohydrates, **ACS Symposium series** 2008, 989, 1-20
67. High performance reverse phase chromatography with fluorescence detection assay for characterization and quantification of pneumococcal polysaccharides, **Vaccine**, 2006, 24, Suppl 2, S2:70-1
68. CARACTERIZACIÓN DE LOS INTERMEDIARIOS SINTÉTICOS DE N-GLICOLIL GM3 POR RMN1H. **Revista Cubana de Química**, vol. XXI, núm. 1, 2009, pp. 20-24
69. Direct validation of NGcGM3 ganglioside as a new target for cancer immunotherapy, **Expert Opinion on Biological Therapy,** 2010, Vol. 10, 153-162.
70. Design and immunological properties of *Helicobacter pylori* glycoconjugates based on a truncated lipopolysaccharidelacking Lewis antigen and comprising an α-1,6-glucan chain, **Vaccine**, 2012, 30, 7332-41.
71. Quantitative proton magnetic resonance determination of N,N-dimethylformamide in one intermediate of the Quimi-Hib vaccine. **Magn. Reson. Chem**.. 2012, 50(8):525-8

**2013**

1. Relevance of O-acetyl and phosphoglycerol groups for the antigenicity of Streptococcus pneumoniae serotype 18C capsular polysaccharide, **Vaccine** 30 (2012) 7090– 7096
2. A New and Efficient Approach to Prepare N‑Acetyl GM3 Ganglioside via Trisaccharide [1→4] Lactone, **Org. Process Res. Dev**. 2013, 17, 53−60
3. Quantitative Proton Nuclear Magnetic Resonance evaluation and total assignment of the capsular polysaccharide Neisseria meningitidis serogroup X, **J Pharmaceutical and Biomedical Analysis** 70 (2012) 295– 300
4. Resonancia magnética nuclear: nuevas aplicaciones en la cuantificación y la evaluación de intermediarios de vacunas basadas en polisacáridos, **VacciMonitor** 2013;22(1):35-42
5. Caracterización de conjugados inmunogénicos de polisacárido capsular *Streptococcus pneumoniae* serotipo 14, **VacciMonitor** 2013;22(1):15-21
6. *Procedure for the conjugation of the* Streptococcus pneumoniae *serotype 6B capsular polysaccharide to the tetanus toxoid.* ***Biotecnología Aplicada*** *2013;30:208-215*
7. Characterization of the Streptococcus pneumoniae serotype 18C capsular polysaccharide by the combination of Chromatographical methods and 1H RMN, **Revista CENIC Ciencias Químicas**, 2013, 44, 57-67.

**2014**

1. Antibacterial and antifungal conjugate vaccine base on synthetic oligosaccharides, ***SPR Carbohydrate Chemistry*** *Volume 40, 2014, pages 564-595.*
2. Chapter 4.4. *Vaccines against bacterial pathogens in* **Carbohydrates Chemistry: State-of-the-art and challenges for drug development,** F. Nicotra and L. Cipolla Eds,Imperial College Press, 2014, chapter 12, 301-319
3. Safety and preliminary immunogenicity of Cuban pneumococcal conjugate vaccine candidate in healthy children. A randomized phase I clinical trial, **Vaccine**, 2014, 32 5266–5270

**2015**

1. From capsular polysaccharide to a conjugate vaccine containing *Haemophilus influenzae* type b synthetic oligosaccharide in ¨**Carbohydrates in Drug Discovery and Design”** 2015, chapter 12, 285-307
2. Safety and Immunogenicity of Cuban Antipneumococcal Conjugate Vaccine PCV7-TT in Healthy Adults, ***MEDICC Review****, 2015, Vol 17, 32-37*

**2017**

1. Prevalence of Pneumococcal Nasopharyngeal Carriage Among Children 2–18 Months of Age, ***Pediatr Infect Dis J***2017;36:e22–e28
2. La nueva vacuna cubana antineumocócica, de las evidencias científicas disponibles, a la estrategia de evaluación clínica y de impacto, **Rev Cubana Pediatr**. 2017;89(sup)
3. Activación del polisacárido capsular de *Streptococcus pneumoniae* serotipo 23F para la obtención de vacunas conjugadas, **VacciMonitor** 2017, 26, 8-16
4. Influence of the Co-Administration of Heptavalent Conjugate Vaccine PCV7-TT on the Immunological Response Elicited by VA-MENGOC-BC® and Heberpenta®-L in Rabbits, **Immunological Investigations**, 2017, 1532-4311
5. Self-assembled particulate PsaA as vaccine against Streptococcus pneumoniae infection, **heliyon**, 2017.e00291
6. NMR line-fitting quantification of polysaccharide N-acylurea-based modification in glycoconjugates of Salmonella Typhi Vi polysaccharide, [**Magn Reson Chem**.](https://www.ncbi.nlm.nih.gov/pubmed/28087987) 2017 Jan 14. doi: 10.1002
7. From individual to herd protection with pneumococcal vaccines: the contribution of the Cuban pneumococcal conjugate vaccine implementation strategy, **International Journal of Infectious Diseases,** 2017, 60, 98-102

**2018**

1. Multicomponent Polysaccharide-Protein Bioconjugation in the Development of Antibacterial Glycoconjugate Vaccine Candidates, **Chemical Science**, 2018, 9, 2581
2. Bioengineered polyester beads co-displaying protein and carbohydrate-based antigens induce protective immunity against bacterial infection, **Scientific Reports**, 2018, 8, 1888
3. Evaluation Strategy to Support the Introduction the New Cuban Conjugated Pneumococcal Vaccine in the National Health System, **J Vaccines Vaccin**, 2018, 9:1
4. Design and biological assembly of polyester beads displaying pneumococcal antigens as a particulate vaccine, **ACS Biomaterials Science & Engineering,** 2018, 49, 3413-3424
5. Safety and immunogenicity of the Cuban heptavalent pneumococcal conjugate vaccine in healthy infants. Results from a double-blind randomized control trial Phase I, **Vaccine**, 36, 2018, 4944
6. Effectiveness of a Serogroup B and C Meningococcal Vaccine developed in Cuba, **MEDICC** **Review**, 2018, 20, 22-29

**2019**

1. Colonización nasofaríngea por *Streptococus pneumoniae* en niños prescolares cubanos: encuestas transversales antes-después de la vacunación antineumocócica, **Vacunas**, 2019, 2 0(1)3–11
2. Synthetic zwitterionic Sp1 oligosaccharides adopt a helical structure crucial for antibody interaction, ***ACS Cent. Sci.*** 2019, 5, 8, 1407-1416

**2020**

1. Vaccination Achievements of Cuba Versus the United States Exposed by the 2019 Measles Epidemic, **American Journal of Public Health,** 2020, Vol 110, 469
2. SARS-CoV-2 Carbohydrate-Mediated Interactions at the Host-Pathogen Interface, <https://doi.org/10.1101/2020.05.13.092478>
3. Expanding the Scope of Ugi Multicomponent Bioconjugation to Produce Pneumococcal Multivalent Glycoconjugates as Vaccine Candidates, ***Bioconjugate Chem.*** 2020, 31, 9, 2231–2240 <https://doi.org/10.1021/acs.bioconjchem.0c00423>

**2021**

1. Las vacunas Soberana como continuidad de la obra del Dr. Carlos J. Finlay. Reflexión en homenaje a su nacimiento y al Día de la Medicina Panamericana, **Anales de la ACC**, 2021, 11,
2. Molecular aspects concerning the use of SARS-CoV-2 Receptor Binding Domain as the target for preventive vaccines, ***ACS Cent. Sci***. 2021, 7, 757-767. https://doi.org/10.1021/acscentsci.1c00216
3. SARS-CoV-2 RBD-Tetanus toxoid conjugate vaccine induces a strong neutralizing immunity, **ACS Chem. Biol**. 2021, 16, 7, 1223–1233, https://doi.org/10.1101/2021.02.08.430146
4. A single dose of SARS-CoV-2 FINLAY-FR-1A dimeric-RBD recombinant vaccine enhances neutralization response in COVID-19 convalescents, with excellent safety profile. A preliminary report of an open-label phase 1 clinical trial, **LANAM**, 2021, 4, 100079 https://doi.org/10.1016/j.lana.2021.100079
5. Glycan array evaluation of synthetic epitopes between the capsular polysaccharides from Streptococcus pneumoniae 19F and 19A. **ACS Chemical Biology**, 2021, 16, 1671-79 https://doi=10.1021/acschembio.1c00347&ref=pdf
6. In-solution buffer-free digestion for the analysis of SARS-CoV-2 RBD protein allows a full sequence coverage and PTM characterization in a single ESI-MS spectrum. **Analytical and Bioanalytical Chemistry***.* 2021, 413(30): 7559-7585.

**2022**

1. A randomized, double-blind phase I clinical trial of two recombinant dimeric RBD COVID-19 vaccine candidates: safety, reactogenicity and immunogenicity, **Vaccine** 2022 Mar 18; 40(13): 2068–2075
2. A COVID-19 vaccine candidate composed of SARS-CoV-2 RBD dimer and Neisseria meningitidis outer membrane vesicles. **RSC Chem. Biol**., 2022, 2022, 3, 242-249 DOI: 10.1039/D1CB00200G
3. Safety and Immunogenicity of anti-SARS CoV-2 conjugate vaccine SOBERANA02 in homologous or heterologous scheme. Pooled analysis of Phase I/IIa clinical trials. **Vaccine**, 2022, 40, 4220-4230
4. Efficacy and Safety of SOBERANA 02, a COVID-19 conjugate vaccine in heterologous three doses combination, **MedRxiv** preprint doi: <https://doi.org/10.1101/2021.10.31.21265703>. **LANAM**, **accepted**
5. Safety and immunogenicity of anti-SARS CoV-2 conjugate vaccine SOBERANA 02 in a two-dose or three-dose heterologous scheme in adults: Phase IIb Clinical Trial. **Med (Cell)**, https://doi.org/10.1016/j.medj.2022.08.001
6. Efficacy and Safety of a protein-based SARS-CoV-2 vaccine (SOBERANA 02 and SOBERANA Plus): a double-blind, randomized, placebo-controlled, phase 3 trial in Iran, **Lancet** **accepted**
7. Potency, toxicity and protection evaluation of PastoCoAd candidate vaccines: novel preclinical mix and match rAd5 S, rAd5 RBD-N and Soberana dimeric-RBD protein, **Vaccine** 2022, 40, 2856-2868
8. Repeat-Dose and Local Tolerance Toxicity of SARS-CoV-2 FINLAY-FR-02 vaccine candidate in Sprague Dawley rats, **Toxicology**, 2022, 471, 153161. doi: 10.1016/j.tox.2022.153161.
9. An open-label phase IIa and double-blind, randomised, placebo-controlled phase IIb clinical trial of FINLAY-FR-1A vaccine confirmed its safety and immunogenicity in COVID-19 convalescents, **Lancet Respiratory Medicine**, 2022, 10(8):785-795.
10. Safety, immunogenicity and predictive efficacy of SOBERANA 02 as two doses scheme or heterologous three doses with SOBERANA Plus in children 3-18 years old: open label Phase I/II clinical trial, **International Journal of Infectious Diseases, accepted**
11. Quantitative NMR for the structural analysis of novel bivalent glycoconjugates as vaccine candidates, J Pharmaceutical and Biomedical Analysis, Volume 2022, 214, 114721 <https://doi.org/10.1016/j.jpba.2022.114721>
12. Estandarización de un procedimiento espectrofotométrico para la cuantificación de polisacárido capsular de Neisseria meningitidis serogrupo X, VacciMonitor 2022;31(2):83-89
13. PastoCovac Plus® Vaccine as a Protein Subunit Booster Significantly Raised Specific SARS-CoV-2 Antibodies in BBV152 Vaccinated Iranian Health Care Workers, Clinical Microbiology and Infection, Submitted