

BIOGRAPHICAL SKETCH

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NAME Fernando Villalta	POSITION TITLE Professor & Chair, Department of Microbiology and Immunology		
eRA COMMONS USER NAME FVILLALTA			
EDUCATION/TRAINING (<i>Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.</i>)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
Cayetano Heredia University, Lima, Peru	B.S.	1972	Biology
Cayetano Heredia University, Lima, Peru	M.S.	1974	Microbiology
Federal University of Rio de Janeiro, Brazil	Ph.D.	1981	Microbiology
Michigan State University, East Lansing, MI	Post-Doc	1981-86	Immunology
Smith College, Northampton, MA	Adv. Trainee	1990	Molecular Biology

A. Positions and Honors**Positions and Employment**

1981-1986 Research Associate, Dept. Microbiology and Public Health, Michigan State University
 1986-1990 Assistant Professor, Div. of Biomedical Sciences, Meharry Medical College, Nashville, TN
 1990 Advanced Research Trainee in Molecular Biology, Department of Biological Sciences, Smith College, Northampton, MA, with Dr. Steven A. Williams
 1990-1996 Associate Professor, Div. of Biomedical Sciences, Meharry Medical College
 1990-2000 Co-Director, Molecular Biology of Tropical Diseases Program, Meharry Medical College
 1996-1997 Professor, Div. of Biomedical Sciences, Meharry Medical College
 1997-2005 Professor, Department of Microbiology, Meharry Medical College
 2000-2003 Director, Molecular Biology of Tropical Diseases Program, Meharry Medical College
 2003-present Director, Molecular Microbial Pathogenesis Training Program, Meharry Medical College
 2003-present Scientific Director, DNA Microarray & Proteomics Facility, Meharry Medical College
 2004-Present Chair, Department of Microbiology & Immunology, Meharry Medical College

Awards, Honors and Professional Activities

Ford Foundation Fellow (72-74); H. Unanue Award in Biomedical Sciences (76); WHO fellow (77-81); H. Unanue Award in Biomedical Sciences (78); NAFEO/USAID Award (88); Michael J. Bent Scholarship Award for Scientific Excellence from Meharry Medical College (92); American Heart Association Study Section Member (94-97); NIH Career Development Award (94-97); Food and Drug Administration, Vaccines and Related Biologic Products Advisory Committee Member (94-98); *Experimental Parasitology* Editorial Board (95-05; 09-pres); External Advisory Committee Member for Biomedical Research, California State University (06-pres); Ad-Hoc reviewer for NIH Study Sections (95, 96, 99, 00, 01, 02); Ad-hoc grant reviewer for NSF (05-pres); Scientific consultant for the DHHS on Infectious Disease Issues (05-pres); ASM/National Center for infectious Diseases Research Associate Program Peer-Review Committee (96-pres); Site Visit evaluations of intramural research at CBER/FDA/NIH campus (06,07); Chair, Scientific Session Host-Parasite Interactions, ASP Annual Mtg. (07); Distinguished Mentorship Award, School of Graduate Studies & Research, Meharry Medical College (01); SBIR/NIH Microbiol Infect Dis Study Section member (01-02); Chair, Innate Immunity to Pathogens Block Symposium, AAI Meeting, 2003 Exp. Biol.; NIH/NIAID Microbiol Infect Dis Study Section (04-); AAI Faculty Mentor Award (04,05,06,07); Chair, Immunity to Parasites and Fungi Block Symposium, AAI Meeting, 2005 Exp. Biol; National Center for Research Resources/NIH Special Emphasis Panel (05-); American Society for Microbiology Mentoring Program Member (06-); *Research & Reviews in Biosciences* Editorial Board (06-present); Mentoring Excellence Award, Meharry Medical College (06); NHLBI Review Panel (2006); NHLBI Review Panel (2006); NIAID/AIDSRRRC Review Panel (2007). Distinguished Professor Award, School of Medicine, Meharry Medical College, (2007); NHLBI Review Panel (2008); NIH/Fogarty Study Section (2008-); NIH/ ZRG1 CB-J 30 Study Section (2009-); Editor of Current Trends in Immunology (2009-pres)

B. Selected Publications (from more than 70 publications)

- Villalta, F.**, and Kierszenbaum, F. 1985. Role of surface N-acetyl glucosamine residues on host cell invasion by *Trypanosoma cruzi*. *Biochim Biophys Acta* 845(2): 216-22.
- Villalta, F.**, and Kierszenbaum, F. 1985. The effects of swinsonine on the association of *Trypanosoma cruzi* with host cells. *Mol. Biochem. Parasitol.* 16: 1-10.
- Kierszenbaum, F., **Villalta, F.**, and Tai, P.C. 1986. Kinetics of human eosinophil activation upon interaction with intracellular (amastigote) forms of *Trypanosoma cruzi*. *J. Immunol.* 138: 662-666.
- Villalta, F.**, and Kierszenbaum, F. 1986. Effects of human colony stimulating factor on the uptake and destruction of a pathogenic parasite (*T. cruzi*) by human neutrophils. *J. Immunol.* 137: 1703-1707.
- Villalta, F.**, and Kierszenbaum, F. 1987. Role of membrane N-linked oligosaccharides in host cell interactions with invasive forms of *Trypanosoma cruzi*. *Mol. Biochem. Parasitol.* 22: 109-114.
- Lima, M. F. and **Villalta, F.** 1988. Host-cell attachment by *Trypanosoma cruzi*: Identification of an adhesion molecule. *Biochem. Biophys. Res. Commun.* 155: 256-262.
- Lima, M. F. and **Villalta, F.** 1989. *Trypanosoma cruzi* trypomastigote clones differentially express a cell adhesion molecule. *Mol Biochem. Parasitol.* 33: 159-170.
- Noisin E.L., and **Villalta, F.** 1989. Fibronectin increases *Trypanosoma cruzi* amastigote binding to and uptake by murine and human monocytes. *Infect. Immun* 57: 1030-1034.
- Lima, M. F. and **Villalta, F.** 1990. *Trypanosoma cruzi* amastigote receptors for human transferrin and their biological role. *Mol. Biochem. Parasitol.* 38: 245-252.
- Villalta, F.**, Lima, M. F. and Zhou, L 1990. Purification of *Trypanosoma cruzi* surface proteins involved in adhesion to host cells. *Biochem. Biophys. Res. Commun.* 172: 925-931.
- Ruiz-Ruano, A., **Villalta, F.** and Lima, M. F. 1991. Changes in polypeptide expression following *Trypanosoma cruzi* differentiation from trypomastigotes to amastigotes. *Biochem. Intl.* 25: 101 -108.
- Villalta, F.**, Lima, M. F., Ruiz-Ruano, A., and Zhou, L. 1992. Attachment of *T. cruzi* to host cells: a monoclonal antibody recognizes a trypomastigote-stage specific epitope on the gp 83 required for parasite attachment. *Biochem. Biophys. Res. Commun* 182: 6-13.
- Villalta, F.**, Lima, M. F., Howard, S. A., Zhou, L. and Ruiz-Ruano, A.1992. Purification of a *T. cruzi* trypomastigote 60 kDa surface glycoprotein that primes and activates murine lymphocytes. *Infect. Immun.* 60: 3025 -3032.
- Villalta, F.**, Valentine, A., Ruiz-Ruano, A., and Lima, M. F. 1993. Purification of a 74 kDa glycoprotein from heart myoblasts that inhibits binding and entry of *T. cruzi* to heart cells. *Mol. Biochem. Parasitol.* 61: 217-230.
- Villalta, F.**, Ferraz Jr., J.C., Smith, C., Burns Jr., J.M., Chaudhuri, G., Ruiz-Ruano, A., and Lima, M. F. 1994. A trans- sialidase gp83 of highly invasive trypomastigote clones of *Trypanosoma cruzi* binds to mammalian cells and appears to mediate *in vitro* and *in vivo* infection. *Mem. Inst. Osw. Cruz.* 89: 27-29.
- Villalta, F.**, Smith, C., Burns, Jr., J.M., Chaudhuri, G., and Lima, M. F. 1996. Fab' fragments of a mAb to a member of the family 2 of trans-sialidases of *Trypanosoma cruzi* inhibit binding of trans-sialidase to mammalian cells, block trypanosome invasion of host cells and neutralize infection by passive immunization. *Ann. NY Acad. Sci.* 797:242-245.
- Lima, M.F., Zhang, Y., and **Villalta, F.** 1997. β -chemokines that inhibit HIV-1 infection of human macrophages stimulate uptake and promote destruction of *T. cruzi* by human macrophages. *Cell. Mol. Biol.* 43:1067-1076.
- Villalta, F.**, Zhang, Y., Bibb, K., Kappes, J. C., and Lima, M. F. 1998. The C-C chemokines RANTES, MIP-1 α and MIP-1 β , induce trypanocidal activity in human macrophages via nitric oxide. *Infect Immun.* 66: 4690-5.
- Villalta, F.**, Zhang, Y., Bibb, K.E., Burns, Jr., J.M. and Lima, M.F.1998. Signal transduction in human macrophages by gp83 ligand of *Trypanosoma cruzi*: Cloned trypomastigote gp83 ligand up-regulates trypanosome entry through the MAP kinase pathway. *Biochem. Biophys. Res. Commun.* 249: 247-252.
- Villalta, F.**, Zhang, Y., Bibb, K.E., Pratap, S., Burns, Jr., J.M. and Lima, M.F.1999. Signal transduction in human macrophages by gp83 ligand of *Trypanosoma cruzi*: Cloned trypomastigote gp83 ligand up-regulates trypanosome entry through protein kinase C activation. *Mol. Cell. Biol. Res. Commun* 2: 64-67.
- Moody T.N., Ochieng, M.J. and **Villalta, F.** 2000. Novel mechanism that *Trypanosoma cruzi* uses to adhere to the extracellular matrix mediated by human galectin-3. *FEBS Lett.* 470:305-308.
- Villalta, F.**, Smith, C.M., Ruiz-Ruano, A. and Lima, M.F. 2001. A ligand that *Trypanosoma cruzi* uses to bind to mammalian cells to initiate infection. *FEBS Lett.* 505:383-388.

- Turner, C. W., Lima, M.F., and **Villalta, F.** 2002. *Trypanosoma cruzi* uses a 45-kDa mucin for adhesion to mammalian cells. *Biochem Biophys. Res. Commun.* 290:29-34.
- Ghansah, T., Ager, E., Freeman-Junior, P., **Villalta, F.**, and Lima, M.F. 2002. Epidermal growth factor binds to a receptor on *Trypanosoma cruzi* amastigotes to induce signal transduction events and proliferation. *J. Eukaryot. Microbiol.* 49:383-390.
- Villalta, F.**, and Lima, M.F. 2003. *T. cruzi* ligands signal human macrophages pathways required for invasion. In *Recent Research Developments in Infection and Immunity* 1:61-76. Transworld Res. Network Publisher.
- Alexander, A. D., **Villalta, F.**, and Lima, M.F. 2003. TGF- α binds to *Trypanosoma cruzi* amastigotes to induce signaling and cellular proliferation. *Infect. Immun.* 71:4201-4205.
- Lima, M. F. and **Villalta, F.** and 2003. Chemokines and *Trypanosoma cruzi* infection. In *Recent Research Developments in Infection and Immunity* 1: 61-76. Transworld Research Network Publisher.
- Kleschenko, Y., Y. Moody, T.N., Furtak, V.A. Ochieng, J. Lima, M. F., and **Villalta, F.** 2004. Human Galectin-3 promotes *T. cruzi* adhesion to human coronary artery smooth muscle cells. *Infect. Immun.* 72: 6717-6721.
- Nde, P. N., Simmons, K. J., Kleschenko, Y. Y., Pratap, S., Lima, M. F., and **Villalta, F.** 2006. Silencing of the laminin γ -1 gene blocks *Trypanosoma cruzi* infection. *Infect. Immun.* 74: 1643-1648.
- Simmons, K J., Nde, N., Kleshchenko, K.K., Lima, M.F. and **Villalta, F.** 2006. Stable RNA interference of host thrombospondin-1 blocks *Trypanosoma cruzi* infection. *FEBS Letters* 58:2365-2370.
- Augustine S.A.J., Kleshchenko K. K., Nde P.N., Pratap P., Ager A.A., Burns, J.M. Jr., Lima M.F., and **Villalta F.** 2006. Molecular Cloning of a *Trypanosoma cruzi* Cell Surface Casein Kinase II Substrate, Tc-1, Involved in Cellular Infection. *Infect. Immun.* 74:3922-3929.
- Madison, M.N., Kleshchenko, Y.Y., Nde, P.N., Simmons, K.J., Lima, M.F. and **Villalta, F.** 2007. Human defensin α -1 causes *Trypanosoma cruzi* membrane pore formation and induces DNA fragmentation which leads to trypanosome destruction. *Infect Immun.* 75:4780-4791.
- Madison, M, N., Lima, M.F., Kleshchenko, Y.Y., Nde, P.N., Simmons, K.J. and **Villalta, F.** 2007. Mechanism of toxicity of human defensin α -1 against *Trypanosoma cruzi*. In *Proceeding of the 13th International Congress of Immunology*. Kalil, J. Cunha-Neto, E., Rizzo, L.V. eds. Medimond Press, Bologna, Italy. pp 447-451.
- Lepesheva, G.I., Ott R.D., Hargrove, T.Y., Schuster, I. Ness W.D. Hill, C.H. Kleschenko, Y.Y., **Villalta, F.** and Waterman M.R. 2007. Sterol 14 α -demethylase as a potential target for antitrypanosomal therapy:enzyme inhibition and parasite cell growth. *Chem Biol* 14: 1283-93.
- Theodore, M., Kawai, Y., Yang, J., Kleschenko Y.Y., Reddy, S.P., **Villalta, F.**, and Arinze I.J. 2008. Multiple nuclear localization signals function in the nuclear import of the transcription factor Nrf2. *J. Biol. Chem.* 283: 8984-94.
- Lepesheva, G., **Villalta, F.**, Hargrove, T., Nes, W.D., and Waterman, M.R. 2008. CYP51 as a potential target for treatment of human infections with Trypanosomatidae. In *Microsomes and Drug Oxidations*. Editor: Laurence S. Kaminsky, New York. pp 13-17.
- Villalta, F.**, Madison, M.N., Nde, P.N., Kleshchenko Y.Y., and Lima, M.F. 2008. Cellular and molecular basis of *Trypanosoma cruzi* infection. *Front Biosci.* 13:3714-34.
- Lepesheva GI, Hargrove TY, Kleshchenko Y, Nes WD, **Villalta F**, Waterman MR. 2008. CYP51: A major drug target in the Cytochrome P450 superfamily. *Lipids* 43: 1117-1125.
- Villalta, F.**, Scharfstein, J., Ashton, A.W., Tyler, K.M., Guan, F., Mukherjee, S., Lima, M.F., Alvarez, S., Weiss, L.M., Huang, H., Machado, F.S., and Tanowitz, H.B. 2009. Perspectives on the *Trypanosoma cruzi*-host cell receptor interactions. *Parasitol. Res.* 104:1251-1260.
- Konkle, M.E., Hargrove, T.Y., Kleshchenko, Y.Y., von Kries, J.P., Ridenour, W., Uddin, M.J., Caprioli, R.M., Marnett, L.J., Nes, W.D., **Villalta, F.**, Waterman, M.R. and Lepesheva, G.I. 2009. Indomethacin amides as a novel molecular scaffold for targeting *Trypanosoma cruzi* sterol 14 alpha-demethylase. *J. Med. Chem.* 52: 2846-2853.
- Lepesheva, G., Park, H. W., Hargrove, T., Vanhollebeke, B., Wawrzak, Z., Harp, J., Sundaramoorthy, M., Nes, D., Pays, E. Chaudhuri, M., **Villalta, F.**, Waterman, M. 2009. Crystal structures of *T. brucei* sterol 14 α -demethylase and implications for selective treatment of human infections. *J. Biol. Chem.* In Press.
- Nde, P.N., Johnson, C.A., Pratap, P., Cardenas, T.C., Kleshchenko, Y.K., Furtak, V.A., Simmons, K.J., Lima, M.F., and **Villalta, F.** 2009. Gene network analysis during early infection of human coronary artery smooth muscle cells by *Trypanosoma cruzi* and its gp83 ligand. *Chem Biodivers.* In Press.
- Kleshchenko, Y. Y., Madison, M. N., Nde, P. N., Cardenas, T. C., Johnson, C. A., Furtak, V.A., Lima, M. F.,

and Villalta, F. 2009. Human epithelial cells respond to *T. cruzi* infection by up-regulating defensin α -1, which damages the trypanosome flagellum structure to block parasite motility and reduce infection. Infect. Immun.

C. Research Support

ACTIVE

8SC1 AI080580-02 (Villalta) 9/1/07- 8/31/11

NIAID/NIH

Molecular analysis of trypanosome infection

This project studies the host cell receptors that mediate *Trypanosoma cruzi* binding to mammalian cells and the pathological consequences of host receptor stimulation by the parasite.

5 T32 AI007281-21A1 (Villalta) 07/01/2009-06/30/2014

NIH/NIAID

Molecular Microbial Pathogenesis Training Program

This is a training grant with pre-doctoral fellows in immunology, biochemistry, and cell and molecular biology of microbial pathogenesis including parasites, bacteria and viruses at Meharry Medical College.

5 T32 HL007737-16 (Villalta) 06/01/2009-05/31/2014

NIH/NHLBI

Research Training in Cardiovascular Biology at Meharry

This is a training grant with pre-doctoral fellow opportunities in the area of molecular basis of heart and blood diseases at Meharry Medical College.

5 R01 GM067871 06 (Waterman & Lepesheva) 01/04/2007- 31/12/2011

NIH/NIGMS

Structural requirements for sterol 14 alpha demethylase

This project studies the structure and function of the 14 alpha demethylase in trypanosomes. Role (PI of consortium, Villalta)

1U54RR026140-0109 (Hendy and Hildreth) 09/30/2009- 06/30/2014

NIH/NCRR

Meharry Clinical and Translational Research Center (MeTRC)

This project enhances clinical and translational research in health disparities at Meharry.

Role: PI of "Proteomic Core", Villalta.

PENDING

Recovery Act Administrative Supplement (NOT-OD-09-056) for NIH grant 8SC1 AI080580-02 (Villalta)

NIH/NIAID

Molecular analysis of trypanosome infection

This project studies the molecular interface of a *T. cruzi* ligand and its host cell receptor. In addition, it requests support for a post-doctoral fellow and a technician.

COMPLETED

GM08037 (Villalta)

8/1/03-7/31/07

NIGMS/NIH

Genes required for *Trypanosoma cruzi* infection

The major goal of this project is to explore mechanisms by which *T. cruzi* infects cells

Role: PI