

**BIOGRAPHICAL SKETCH**

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NAME: Douglas M. Watts

eRA COMMONS USER NAME (credential, e.g., agency login): DWATTS2

POSITION TITLE: Executive Director, Department of Laboratory Animal Resources and Institutional Biosafety and Co-Director of the Virology and Immunology Cluster, Border Biomedical Research Center

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
University of Wisconsin, Madison, WI	M.S.	1972	Virology, Medical Entomology & Vertebrate Ecology
University of Wisconsin, Madison, WI	Ph.D.	1974	Virology, Medical Entomology & Vertebrate Ecology

**Please refer to the Biographical Sketch sample in order to complete sections A, B, C, and D of the Biographical Sketch.**

**A. Personal Statement**

Dr. Douglas Watts received his Ph.D. degree in 1974 on the ecology and epidemiology of viral diseases of man and animals from the University of Wisconsin, Madison, Wisconsin. Since then, he has served 30 years with the Department of Defense (DoD) Medical Research Community, including Chief of an Arthropod-borne Viral Diseases Research Program at the Walter Reed Army Institute of Research in Washington D.C.; Virologist at the Armed Forces Research Institute of Medical Sciences, Bangkok, Thailand.; Microbiologist at the U.S. Army Medical Research Institute of Infectious Diseases, Ft. Detrick, Maryland; Head, Department of Virology at the U.S. Naval Medical Research Unit #3, Cairo, Egypt; and Scientific Director, U.S. Naval Medical Research Unit Detachment, Lima, Peru. He also served as the Medical Research Advisor for the World Health Organization's (WHO) Southeast Asia Regional Office in New Delhi, India, and as a WHO adviser to the Ministry of Health in Sri Lanka. Dr. Watts retired from his civil service position with the DoD in 2002 and joined the Department of Pathology, University of Texas Medical Branch (UTMB) at Galveston, Texas in July 2002 where he served as Professor and the Associate Director of the Regional Center of Excellence for Biodefense and Emerging Infectious Diseases Research and as a member of the planning and construction committee of the Galveston National Biocontainment Laboratory. In addition, he taught and mentored medical and graduate students and conducted research to develop vaccines and therapeutic for viral diseases, including West Nile, Yellow fever, monkey pox, and Severe Acute Respiratory Disease Syndrome (SARS). In 2008, Dr. Watts accepted a position as the Executive Director of Veterinary Services and Institutional Biosafety at the University of Texas at El Paso. Subsequently, he was selected as a member of the UTEP graduate faculty and as the Co-Director of the Infectious Diseases and Immunology Units of the Border Biomedical Research Center that supports his research on the ecology and epidemiology of West Nile, Dengue and other arthropod-borne viral diseases in the El Paso community. These studies also include community engagement projects aimed at sharing vector-borne disease surveillance information with the El Paso community and a program to teach elementary students about the biology and control of medically important mosquito vectors. Also, in

September, 2013, Dr. Watts and colleagues in the U.S. and Africa were awarded a 5 year multi-million dollar contract to develop and evaluate an attenuated vaccine for protecting livestock against Rift Valley Fever disease in Africa. Dr. Watts and colleagues has authored and/or co-authored 200 scientific articles, including several medical book chapters on viral diseases, and a book on the diagnosis of HIV infection. Dr. Watts' current research interest is on the global threat and impact of emerging viral diseases on the health of humans, animals and the environment.

## **Positions and Honors**

### Employment History and Relevant Experience

1974 – 1977	Chief, Arboviral Ecology Section, Department of Entomology, Walter Reed Army Institute of Research, Washington, D.C.
1977 – 1980	Assistant Chief, Department of Virology, U.S. Army Medical Component, Armed Forces Research Institute of Medical Sciences, Bangkok, Thailand
1981 – 1982	Research Microbiologist, Department of Arboviral Entomology, Division of Virology, U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID), Frederick, MD & WHO Consultant to the Medical Research Institute, Colombo, Sri Lanka
1982 – 1984	Medical Research Technical Officer, World Health Organization (WHO) Regional Office for Southeast Asia, World Health House, New Delhi, India
1984 – 1988	Research Microbiologist, Department of Pathogenesis and Immunology, Disease Assessment Division, U.S. Army Medical Research Institute for Infectious Diseases, Frederick, MD
1988 – 1991	Head, Division of Virology, U.S. Naval Medical Research Unit No. 3, Cairo, Egypt
1991 – 1993	Director, Infectious Disease Threat Assessment Research Program, U.S. Naval Medical Research Institute, Bethesda, MD
1993 – 2000	Scientific Director, U.S. Naval Medical Research Center Detachment, Lima, Peru
2000 – 2002	Director, Naval Medical Research Center Overseas Infectious Diseases Research Program, Silver Spring, MD
2002 – 07/2008	Professor and Associate Director of Scientific Administration, Center for Biodefense and Emerging Infectious Diseases, Department of Pathology, University of Texas Medical Branch, Galveston, TX
07/2008–present	Executive Director, Veterinary Services and Biosafety; Co-Director of Infectious Disease and Immunology, Border Biomedical Research Center, University of Texas at El Paso (UTEP), El Paso, TX

### Professional Affiliations and Honors

#### **Honors:**

1980	Certificate of Merit Award, USAMRIID, Frederick, Maryland
1969	US Army Commendation Medal, Walter Reed Army Institute of Research, Washington, DC
1981	Sustained Superior Performance Award, USAMRIID
1981	Certificate of Service Award, 10 years, U.S. Government Service, USAMRIID
1982	Meritorious Civilian Service Award, USAMRIID
1986	Certificate of Service Award, 15 years, U.S. Government Service, USAMRIID
1991	Letter of Commendation, U.S. Naval Medical Research Unit No.3, Cairo, Egypt
1996	Superior Civilian Service Award, U.S. Naval Medical Research Institute Detachment, Lima, Peru
1999	Honorary Member (lifetime) of the Peruvian Society of Tropical Medicine
2001	Distinguished Civil Service Award, U.S. Naval Medical Research Center
2005	Distinguished Alumnus Award, Berea College, Berea, Kentucky

## **B. Contribution to Science**

**1. Ecology of Arboviruses.** The mechanism of maintenance of arboviruses during adverse climatic condition, especially during the winter season in North America remained a major enigma for more than a century. As the lead investigator of a team of virologists, entomologists and epidemiologist, our research revealed for the first time that LaCrosse encephalitis virus was maintained during the winter season in the overwintering eggs of the vector, *Aedes triseriatus* eggs as a result of transovarial transmission. In addition, myself and colleagues discovered that St. Louis encephalitis virus overwintered in adult hibernating *Culex pipens* mosquitoes in North America. These findings were among the most important contribution to the field of ecology and medical entomology during the 20th century.

## References:

1. **Watts DM**, Grimstad PR, DeFoliart GR, Yuill TM, Hanson RP. Laboratory transmission of LaCrosse encephalitis virus by several species of mosquitoes. *J Med Ent* 10:583-586, 1973.
2. **Watts DM**, Pantuwanta S, DeFoliart GR, Yuill TM, Thompson WH. Transovarial transmission of LaCrosse virus (California Encephalitis Group) in the mosquito *Aedes triseriatus*. *Science* 182:1140-1141, 1974.
3. **Watts DM**, Thompson WH, Yuill TM, DeFoliart GR, Hanson RP. Overwintering of LaCrosse virus in *Aedes triseriatus*. *Am J Trop Med Hyg* 23:694-700, 1974.
4. **Watts DM**, Pantuwanta S, Yuill TM, DeFoliart GR, Hanson RP. Transovarial transmission of LaCrosse virus in *Aedes triseriatus*. *Ann N Y Acad Sci* 266:135-143, 1975.
5. **Bailey CL**, Eldridge BF, Hayes DE, Watts DM, Tammariello RF, Dalrymple JM. Isolation of St. Louis encephalitis virus from overwintering *Culex pipiens* mosquitoes. *Science* 199:1346-1349, 1978

**2. Epidemiology of Arboviruses and other viral diseases of humans.** As an international recognized infectious disease biomedical researcher, my contributions to science have focused on the global epidemiology of viral disease pathogens, including Human Immunodeficiency virus, Human T cell Leukemia virus, Hepatitis B/Delta virus, dengue viruses, Venezuelan equine encephalitis virus, West Nile encephalitis virus, yellow fever virus, Oropouche virus, Mayaro virus, Chikungunya virus. Among these viral diseases, I was the leader of research that revealed the first distribution and burden of HIV and HTLV in northern Africa and South America, and the first detailed epidemiological description of a unique strain of Hepatitis B/Delta virus in South America. I directed research that showed that dengue virus transmission was influenced by environmental temperature, and was the first to describe the epidemiology of dengue in Peru and that the American genotype of dengue virus 2 did not cause dengue hemorrhagic fever among humans with pre-existing dengue 1 antibody in this country. Also, myself and collaborator's research findings described the epidemiology of the first enzootic strains of Venezuelan encephalitis viruses, and the epidemiology of Mayaro, and Oropouche disease in Peru and surrounding countries.

1. Russell KL, Carcamo C, **Watts DM**, Sanchez J, Gotuzzo E, Euler A, Blanco JC, Jimenez AG, Alava A, Carr JK. Emerging Genetic Diversity of HIV-1 In South America. *AIDS* 14:1785-1791, 2000.
2. Cheingsong-Popov R, Callow D, Beddows S, Shaunak S, Wasi C, Kaleebu P, Gilks C, Petrascu I, Garaev M, **Watts DM**, Constantine N, Weber J. Geographical diversity of human immunodeficiency virus type 1: Serologic reactivity to env epitopes and relationship to neutralization. *J Infect Dis* 165:256-261, 1992.
3. Gotuzzo E, De las Casas E, Deza L, Cabrera J, **Watts DM**. Tropical Spastic Paraparesis and HTLV-I Infection: Clinical and Epidemiological Study in Lima-Peru. *J Neurol Sci* 143:114-117, 1996.
4. Casey JL, Niro GA, Engle RE, Vera A, Gomez H, McCarthy M, **Watts DM**, Hyams KC, Gerin JL. Hepatitis B virus/Hepatitis D virus Co-Infection in Outbreaks of Acute Hepatitis in the Peruvian Amazon Basin. The Roles HDV Genotype III and HBV Genotype F. *J Infect Dis* 174:920-926, 1996.
5. **Watts DM**, Burke DS, Harrison BA, Nisalak A, Whitmire RW. Effects of temperature on the transmission of dengue virus type 2 by *Aedes aegypti*. *Am J Trop Med Hyg* 36:143-152, 1986.
6. Hayes CG, Phillips IA, Callahan JD, Griebenow WF, Hyams CK, **Watts DM**. Epidemiology of Dengue in the Amazon Basin Region of Peru: Antibody Rates among Jungle, Rural and Urban Populations. *Am J Trop Med Hyg* 55:459-463, 1996.
7. **Watts DM**, Porter K, Putvatana R, Vasquez B, Calampa C, Hayes CG, Halstead SB. Failure of Secondary Dengue 2 Genotype I Infection to Cause Dengue Hemorrhagic Fever. *The Lancet* 354:1431-1434, 1999.
8. **Watts DM**, Callahan J, Rossi C, Oberste MS, Roehrig JT, Wooster MT, Smith JF, Cropp CB, Gentrau EM, Karabatsos N, Gubler D, Hayes CG. Venezuelan Equine Encephalitis Febrile Cases among Human in the Peruvian Amazon River Basin. *Am J Trop Med Hyg* 58:35-40, 1998
9. **Watts DM**, Phillips I, Callahan J, Griebenow W, Hyams C, Hayes CG. Oropouche Virus Transmission in the Amazon Basin of Peru. *Am J Trop Med Hyg* 56:148-152, 1997.
10. Tesh RB, **Watts DM**, Russell KL, Karabatsos N, Damodaram C, Powers A, Hice CL, Cropp BC, Roehrig JT, Gubler DJ. Mayaro Virus Disease: An Emerging Mosquito-Borne Zoonosis in Tropical South America. *Clin Infect Dis* 28:67-73, 1999.

**Viral disease diagnostics.** As required by my research on mainly on arboviral diseases, I was the leader of the development and evaluation of several diagnostic assay primarily for dengue. Although these assays were not FDA approved, they continue to be used to support research on dengue.

1. **Watts DM**, Harrison BA, Nisalak A, Scott R McN, Burke DS. Evaluation of *Toxorhynchites splendens* (Diptera: Culicidae) as a bioassay host for dengue viruses. *J Med Entomol* 19:54-59, 1982.
2. Puri B, Henchal EA, Burans J, Porter KR, Nelson W, **Watts DM**, Hayes CG. A rapid method for detection of flaviviruses by polymerase chain reaction and nucleic acid hybridization. *Arch Virol* 134:29-37, 1994.
3. Wu S-JL, Hanson B, Paxton H, Rossi C, Henchal EA, Porter KR, **Watts DM**, Hayes CG. Evaluation of a Dip-Stick Immunoassay for the Detection of Antibodies to Dengue Virus. *Clin Diagn Lab Immunol* 4:452-457, 1997.
4. Callahan JD, Wu S-JL, Dion-Schultz A, Mangold BE, Peruski LF, **Watts DM**, Porter KR, Murphy GR, Suharyono W, King C-C, Hayes CG, Temenak JJ. Development and evaluation of serotype-and group-specific fluorogenic RT-PCR (TaqMan) assays for dengue virus. *J Clin Microbiol* 39:4119-4124, 2001.
5. Wu Shuenn-Jue L, Lee EM, Putvatana R, Shurtleff RN, Porter KR, Suharyono W, **Watts DM**, King C-C, Murphy GS, Hayes CG, Romano JW. Detection of Dengue Viral RNA Using a Nucleic Acid Sequence-Based Amplification Assay. *J Clin Microbiol* 39:2794-2798, 2001.

**Vaccines for arboviral diseases.** My research efforts resulted in the development and preclinical evaluation of human candidate vaccines for West Nile and yellow fever. These vaccine candidates are very promising and are currently undergoing Phase 2 testing in human volunteers.

1. Lieberman MM, Clements DE, Ogata S, Wang G, Corpuz G, Wong T, Martyak T, Gilson L, Collier BA, Leung J, **Watts DM**, Tesh RB, Siirin M, Travassos da Rosa A, Humphreys T, Weeks-Levy C. Preparation and immunogenic properties of a recombinant West Nile subunit vaccine. *Vaccine*. 25(3):414-423. 2007. **PMCID: PMC 1839850**.
2. **Watts DM**, Tesh RB, Siirin M, Rosa AT, Newman PC, Clements DE, Ogata S, Collier BA, Weeks-Levy C, Lieberman MM. Efficacy and durability of a recombinant subunit West Nile vaccine candidate in protecting hamsters from West Nile encephalitis. *Vaccine* 25(15):2913-2918. 2007. **PMCID: PMC1876746**.
3. Siirin MT, Travassos da Rosa APA, Newman P, Weeks-Levy C, Collier B, Xiao S, Lieberman MM, **Watts DM**. Evaluation of the Efficacy of a Recombinant subunit West Nile Vaccine in Syrian Golden Hamsters. *Am J Trop Med Hyg*. 79: 955-962, 2008. **PMCID: PMC2765405**.
4. Monath TP, Lee CK, Julander JG, Brown A, Beasley DW, **Watts DM**, Hayman E, Guertin P, Makowiecki J, Crowell J, Levesque P, Bowick GC, Morin M, Fowler E, Trent DW. Inactivated yellow fever 17d vaccine: development and nonclinical safety, immunogenicity and protective activity. *Vaccine* 28(22):3827-40, 2010. **PMID: 20347059**.

**Therapeutics.** Efforts to identify and evaluate candidate therapeutic were focused on dengue, West Nile, Crimean-Congo hemorrhagic fever (CCHF), monkeypox, and Severe Acute Respiratory Disease Syndrome (SARS). Studies on dengue evaluated a small molecule, human antibody for West Nile and SARS, ribavirin for CCHF and ST-246, a small-molecule compound for monkeypox. Of these studies, only ribavirin proved to be effective for inhibiting in-vitro replication of CCHF virus. Although only very limited studies have continued to evaluate ribavirin for the treatment of CCHF, the drug has been shown to be efficacious for the treatment of human cases in CCHF virus enzootic regions.

1. Watts DM, Ussery MA, Nash D, Peters CJ. Inhibition of Crimean-Congo hemorrhagic fever viral infectivity yields *in vitro* by the antiviral drug Ribavirin. *Am J Trop Med Hyg* 41:581-585, 1989.
2. Bente DA, Forester NL, Watts DM, McAuley AJ, Whitehouse CA, Bray M. Crimean-Congo Hemorrhagic fever: History, epidemiology, pathogenesis, clinical syndrome and genetic diversity. *AVR* 2013 Oct; 100(1):159-89.

**Animal models.** I played a key role in the evaluation of several animal model for infectious diseases. Among these, ground squirrels and prairie dogs were founds to be excellent models for mimicking human monkeypox disease, and hamsters were suitable models developing a disease syndrome very similar to that caused by West Nile and St. Louis encephalitis in humans.

1. Wu SJL, Hayes CG, Dubois DR, Widnheuser MG, Kang YH, **Watts DM**, Sieckmann DG. Evaluation of the Severe Combined Immunodeficient (SCID) Mouse as an Animal Model for Dengue Viral Infection. *Am J Trop Med Hyg* 52:468-476, 1995.
2. Tesh RB, **Watts DM**, Sbrana E, Siirin M, Xiao S-Y. Experimental infection of ground squirrels (*Spermophilus tridecemlineatus*) with monkeypox virus. *Emerg Infect Dis* 10: 1563-1567, 2004. **PMCID PMC3320280**.
3. Xiao S-Y, Sbrana E, Watts DM, Siirin M, da Rosa AP, Tesh RB. Experimental infection of prairie dogs with monkeypox virus. *Emerg Infect Dis*. 11:539-545, 2005. **PMCID 15829191**.
4. **Watts DM**, Tesh RB, Siirin M, Rosa AT, Newman PC, Clements DE, Ogata S, Collier BA, Weeks-Levy C, Lieberman MM. Efficacy and durability of a recombinant subunit West Nile vaccine candidate in protecting hamsters from West Nile encephalitis. *Vaccine* 25(15):2913-2918. 2007. **PMCID: PMC1876746**

5. Siirin MT, Duan T, Lei H, Guzman H, da Rosa AP, **Watts DM**, Xiao SY, Tesh RB. Chronic St. Louis encephalitis virus infection in the golden hamster (*Mesocricetus auratus*). *Am J Trop Med Hyg.* 76(2):299-306, 2007. **PMCID 17297039.**

### C. Research Support

#### D. Active:

1. USAID RFA-OAA-12-000036 – Watts DM (PI) 09/27/2013 – 09/26/2018  
Cooperative Agreement: US AGENCY FOR INTERNATIONAL DEVELOPMENT (FED) -SPN01405  
Global Hunger and Food Security Research Strategy: Climate Resilience, Nutrition, and Policy – Feed the Future. Innovation Lab for Rift Valley Fever Control in Agriculture.

Role: As the Principal Investigator, directs and manages this collaborative research project aimed at evaluating a novel live – attenuated vaccine to protect livestock against Rift Valley Fever in Tanzania.

#### E. Completed (last three years):

U54 AI 057156 NIH/NIAID – Walker DH (PI) 04/23/2009 – 02/28/2015  
Region VI Center for Biodefense and Emerging Infections.  
The goals of this project were to conduct multidisciplinary, multifaceted research to develop biodefense countermeasures for Category A – C infectious agents.  
Role: D. Watts served as the Associate Director to support the P.I. manage the overall research center, including the administrative and scientific activities.

Subcontract 07/01/2012 – 09/30/2013  
Public Health Foundation Enterprises Program 2121 – Watts DM (PI)  
Project: Dengue Surveillance on the Texas and Mexico Border.  
The goal of the project was to conduct a survey among patients who present at medical care facilities with febrile illnesses to determine if dengue viruses are being transmitted in the Texas/Mexico border community of El Paso, Texas.

1 U54 AI 057156 NIH/NIAID - Walker DH (PI) 04/23/2009 – 09/04/2014  
Region VI Center for Biodefense and Emerging Infections.  
*Subproject:* Toward Defining Protective Human T-cell Epitopes in Rift Valley Fever Virus.  
Developmental Project PI: June Kan-Mitchell. 09/01/2009 – 08/31/2012  
The purpose of this project was to evaluate the potential role of T-cells for improving an attenuated Rift Valley fever vaccine (MP-12).  
Role: D. Watts served as an assistant project leader, responsible for advising and for performing the immunogenicity and efficacy experiments for any vaccine candidates in a laboratory animal model.

Humanitas International Foundation - Johnson K (PI) 07/25/2011-12/30/2012  
Project: Evaluation of compounds for the inhibition of dengue 2 virus replication.  
The purpose of this project was to evaluate three compounds for the inhibition of dengue virus 2 replication in baby hamster kidney cells (BHK-21) Clone - 15, and/or African Green monkey cells (Vero) as potential therapeutics for dengue and dengue hemorrhagic fever.  
Role: D. Watts participated in the design and performed all of the in-vitro experiments and prepared reports and manuscripts.