

CURRICULUM VITAE

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A. ACADEMIC TRAINING

1980-85 Bachelor of Veterinary Medicine (BVM), **University of Nairobi**, Nairobi, Kenya
1986-89 Master of Science, **University of Nairobi**, Nairobi, Kenya
1990-94 Doctor of Philosophy, **The Pennsylvania State University**, State College,
Pennsylvania
1994-99 Postdoctoral Fellowship, **Mayo Clinic and Foundation**, Rochester, Minnesota

Additional Training

October 26 – Nov 6th, 2009. **Applied Epidemiology Course**, Conducted by Emory University's Rollins School of Public Health (Prof. Philip Brachmman and Prof. Richard Diker) and the Centers for Disease Control and Prevention (CDC). Course taken in Nairobi, Kenya October 26 – November 6th, 2009.

July, 2012 – Training on **Good Clinical Laboratory Practices**, Conducted by Family Health International

B. EMPLOYMENT/POSITIONS HELD

July 1985 - June 1990 Assistant Lecturer
Faculty of Veterinary Medicine, Clinical Studies Department,
University of Nairobi.

Aug 1990 - Aug 1994 Graduate Assistant
Department of Veterinary Science, Pennsylvania State University

(Under supervision of Charles A. Dangler, PhD)

- Sept 1994 - Sept 1995 Post-doctoral Research Fellow
Mayo Clinic and Foundation, Departments of Immunology and
Neurology (Under supervision of Moses Rodriguez, M.D.)
- Sept 1995 – Aug 1998 Senior Research Fellow
Mayo Clinic and Foundation, Departments of Immunology and
Neurology
- Sept 1998 - March 1999 Assistant Professor of Neurology
Mayo Clinic and Foundation, Departments of Neurology
- April 1999 – March 2003 Assistant Professor, Molecular Virology and Immunology
University of Minnesota, Department of Veterinary and Biomedical
Sciences, College of Veterinary Medicine.
- April 2003 – 2009 Associate Professor, Virology and Immunology
University of Minnesota, Department of Veterinary and Biomedical
Sciences, College of Veterinary Medicine.
- Dec 2004 – 2009 Virologist and Laboratory Director,
Global Disease Detection/International Emerging Infections Program
- Kenya, Office of Global Health, National Center for Infectious
Disease, Center for Disease Control (CDC), Nairobi, Kenya.
- Dec 2004 – 2009 Resident Advisor and Lecturer,
Field Epidemiology and Laboratory Training Program (FELTP).
Laboratory Management and Epidemiology (LME) Track, Institute of
Tropical Medicine and Infectious Disease (ITROMID), Jogo
Kenyatta University of Agriculture and Technology/Kenya Medical
Research Institute, Nairobi, Kenya.
- October 2007 – 2009 Associate Director for Laboratory Services
Center for Disease Control and Prevention-Kenya. Coordinating all
Laboratory activities of GAP, HIV-R, GDD, Malaria, and TB.
Working as the chief liaison for improving laboratory capacity at the
National Public Health Laboratory Services, Kenya
- November 2009 – 2014 Virologist and Director,
One Health Program
United States' Centers for Disease Control and Prevention-Kenya
- November 2014-Present Virologist and Head of One Health Program, Chief Research Officer,
Kenya Medical Research Institute, Nairobi, Kenya

- (i) Enhancing collaboration between human and animal health in Kenya
- (ii) Enhancing capacity for disease surveillance and outbreak management at the Ministry of Livestock Development
- (iii) Conducting research and the human-animal interface.

Major achievements:

- (i) Establishment of the Zoonosis Disease Unit (ZDU) in Kenya, including the signing of the MOU between the human and animal health ministries on August 2nd 2011 to operationalize the Unit. The two ministries each posted an epidemiologist to the Unit on March 1st, 2012. Worked with US/DOD's Disease Threat reduction Agency (DTRA) and US/DOS' Biosecurity Engagement Program (BEP) to secure funding for construction of ZDU Offices that were completed on August 2012, hiring of office administrator and data manager and funding field activities for the Unit for 3 years. The Kenya ZDU is serving as a model for other countries in the region.
- (ii) Working with Government of Kenya to complete a 5-year (2012-2017) strategic plan for the implementation of One Health in Kenya.
- (iii) Sourced funding to support training of veterinarians in the Field Epidemiology and Laboratory Training Program (FELTP). Also worked with the Program's resident adviser to revise the curriculum to incorporate One Health competencies.

November 2004 – 2010: **Laboratory Director**, Global Disease Detection/International Emerging infections Program-Kenya, Centers for Disease Control and Prevention.

Responsibilities:

- (i) **Establishment and equipping of TWO BL-3 laboratories**, one in Nairobi for testing human specimens. The second in Kisumu specific for testing avian specimens for avian influenza.
- (ii) **Staffing and training Kenyan scientist** in start-of-the art testing of specimens using serology and real-time PCR technologies. Establishing and training Kenya staff in pathogen genome sequencing using the ABI 3100 DNA Sequencer.
- (iii) **Management of bacteriology testing** including blood culturing and sub-typing.
- (iv) **Biosafety oversight for CDC Kenya**
- (v) **Personnel Supervision**: TWO Senior scientists (PhDs) and 30 Junior scientists (10 BSc and 16 HND).
- (vi) **Laboratory support in diagnostics** – IEIP population-based surveillance in rural and urban Kenya population. Diagnostic support in Avian influenza surveillance.

June 2005 – Present: **Lead Scientist** –GDD/IEIP Rift valley fever virus surveillance project in humans, livestock and wildlife in Kenya. Development of the research protocol and studies.

May 2005 – 2008: Member of the Kenya National Avian Influenza Taskforce. Chair of the Laboratory subcommittee

February – March 2006: **Lead Laboratory Scientist**, CDC Response Team to Nigeria for the H5N1 Outbreak. Established a temporary human testing laboratory at Abuja. Trained

local Nigerian staff on PCR testing for H5N1 at the Nigeria veterinary Research Institute, VOM.

May 2006: **Leader of Laboratory Assessment and Training:** Ethiopia (Addis Ababa) following a false report of H5N1 Avian Influenza outbreak in poultry. Re-tested the samples, which were all negative for H5N1.

June – September 2006: **Co-coordinator of Training in Laboratory Diagnosis of Avian influenza** for 14 WHO regional FLUNET laboratories in Africa. Training organized jointly with WHO-Africa region (WHO-AFRO).

December 2006 – May 2007: Lead laboratory Scientist, CDC Response to Rift Valley fever outbreak in Kenya, Somalia, and Tanzania. Established a Field laboratory in Garissa, Kenya for rapid testing of specimens in an epicenter. Tested all human specimens from Kenya (over 700 suspected cases), Somalia (approx 100 suspected cases), and Tanzania (over 400 suspect cases). Performed over 10,000 serologic and PCR tests on suspect human cases.

December 2006: Wrote a successful proposal for \$225,000 from USAID to fund RVF vaccine purchase for the Kenya Ministry of Livestock and Fisheries Development.

February 2007 – Team member of a CDC team (Team member, Nord Zeidner) to assess laboratory capacity for Rift valley fever diagnosis in Tanzania.

May 2007: Consultant from CDC: Assisting the Kenya Ministry of Livestock and Fisheries Development in sourcing funding for the upgrading to BL-3 status of the Kabete Veterinary Virology Laboratory from USAID. \$500,000 was awarded for the project.

May 2007: Coordinator: Sourcing funding for the renovation of a Microbiology Reference Laboratory at the National Public Health Laboratory Services in the Kenya Ministry of Health. First installment of \$350,000 for renovation of the Data Section awarded by AFENET.

August 30 – Sept 4th, 2009: Chair of Organizing Committee, 3rd AFENET and 5th TEPHINET Africa Regional Conference, Sarova Whitesands Hotel, Mombasa, Kenya.

3. ANIMAL-HUMAN (ONE-HEALTH) RESEARCH EXPERIENCE

August 2006 – Present: Research on non-epidemic activities of Rift Valley Fever (RVF) fever virus in Kenya. Research includes: (i) hospital-based surveillance for malaria-negative acute febrile illness (AFI) human patients who have had animal contact at Garissa Provincial Hospital; (ii) sentinel herd of sheep and goats at Ijara district; (iii) serosurvey on Kenya wildlife for RVF virus antibodies. The studies are designed to identify acute RVF cases in the region during non-epidemic periods.

Manuscripts: Seroprevalence of Rift Valley fever virus in Kenya wildlife during an inter-epidemic period (Manuscript # 55 and 58). Discovery of high prevalence of *Richettsia felis* among acute febrile human cases in Northeastern province, Kenya.

September 2006 – 2010: Migratory birds surveillance every Sept – March season (winter in Northern hemisphere) to identify influenza viruses circulating among the migratory bird population in Kenya.

Manuscripts: Identified various influenza viruses including low pathogenic H5, and H1N2

September 2007 – 2011: Co-investigator (PI: Sarah Cleaveland, University of Edinburgh) on a broad zoonosis project in Kenya. Projects investigate presence of zoonotic pathogens among animals (and humans) in the two sites of the IEIP population-based surveillance; Kibera urban informal settlement in Nairobi, and Lwak rural community in Nyanza. The study on AFI cases focuses on detecting *Richettsia spp*, *Coxiella burnetti* (Q-fever), *Bartonella spp*, *Chlamydia spp*, and *Toxoplasma spp*. For enteric disease, the study focuses on Rotavirus, *Echinococcus spp* (dogs), *Cryptosporidium spp*, *Giardia*, *E.coli*, *Campylobacter spp*, and *Salmonella spp*.

December 2009-Present: Surveillance of influenza at the human-animal interface in Kenya ecosystem (in collaboration with NIH and University of Minnesota). The study includes sampling avians, dogs, pigs, cats in the Kibera urban informal settlement and Lwak rural community. In addition, pigs at a slaughterhouse serving the Nairobi region are being sampled to determine the presence of pHIN1.

CAPACITY BUILDING

Training - Instrumental in addition of Veterinarians in the Kenya FELTP program
- Veterinary students mentorship – Alina Evans (DVM, MPH), Melinda Rostal (DVM, MPH), Jo Halliday (PhD).

Influenza – Kenya National Influenza Center - Setting up, equipping and training
- Hiring of a Veterinary epidemiologist in the CDC influenza program

- Hired Prof P.N. Nyaga (a Vet Expert) for 2 years to work on the human-animal interface during the threat of H5N1
- Provided the MOL Lab with PCR and ELISA capacity, plus provided training.
- Championed assistance in Building an animal BL-3 at Kabete (not yet successful).

Member of Kenya Zoonotic Disease Technical Working Group (ZTWG). The group was started to develop policy on coordinated management of zoonotic diseases in the country to mitigate effect on animal and human health. Among steps taken are: (i) Commenced work to develop a list of priority zoonotic diseases based on input from human, livestock, and wildlife departments; (ii) Steps towards the establishment of a National Center for Zoonotic Infectious Diseases (NCZID) to be housed outside of the Kenya Ministry of Health and Kenya Ministry of Livestock.

2008- Present: CDC-Kenya Focal Person. US Department of States Cooperative Threat Reduction Program (Biosecurity Engagement Program (BEP)) in Africa. Worked to assist DOS identify areas of engagement within the Government of Kenya (GOK). Served as the overall manager of the BEP program implementation in Kenya including

coordinating policy development meeting and workshops at the GOK. Key achievement included: (i) 3-day workshop for human and animal health experts that resulted in the establishment of a Zoonosis Disease Unit nested within the Ministry of Health and Ministry of Livestock Development within the GOK. The ZDU is the technical arm that would lead the process of surveillance and outbreak management for zoonotic diseases. (ii). Coordinated a 3-day workshop lead by the Kenya National Council for Science and Technology (NCST) to deliberate on a draft country biosecurity policy.

2010- Present: CDC-Kenya Focal Person. US Department of Defense Cooperative Bioengagement Program Reduction Program in Africa. Worked to assist DOD perform a biosecurity assessment to determine the needs in Kenya. Served as the country coordinator for key activities including: (i) Writing a proposal to for funds to operationalize the Zoonosis Disease Unit within the GOK. The funds assisted obtaining space and administrative help for the GOK technical; ZDU medical and veterinary epidemiologists and funding for field work to start baselining zoonotic diseases (ii). Coordinated the development of joint proposal to determine the incidence of Brucellosis and Anthrax in Kenya. A 3-year \$600,000 million/yr project funded by DTRA.

4. REGIONAL (AFRICA) INFLUENZA ACTIVITIES

May - December 2007: **Laboratory Assessment and Training in Tanzania:** Represented CDC-Atlanta Influenza branch in Tanzania (Dar es Salaam) to assist in establishment a National Influenza Center at the National medical research Institute (NIMRI). After initial lab assessment, coordinated equipping of the lab and training of lab staff (Michael Mwasekaga; Miriam Matonyi) to perform H5N1 testing. Mission resulted in WHO issuance of NIC status for EHNRI. Also assisted with Tanzania Refugee testing for Influenza (worked with Lara Ho).

July - December 2007: **Laboratory Assessment and Training in Ethiopia:** Represented CDC-Atlanta Influenza branch in Ethiopia (Addis Ababa) to assist in establishment a National Influenza Center at the Ethiopia Human Nutrition Research Institute (EHNRI). Coordinated training of lab staff to perform H5N1 testing and the purchase of real-time PCR equipment and airflow system to improve NIC safety. Mission resulted in WHO issuance of NIC status for EHNRI.

September - November 2007: **Laboratory Assessment and Training in DRC:** Represented CDC-Atlanta Influenza branch in Democratic Republic of Congo (DRC; Kinshasa) to establish a National Influenza Center (humans) and assess Animal Influenza testing lab at RARDA, Kigali. Coordinated training of lab staff and purchase of real-time PCR equipment and airflow system to improve NIC safety Mission resulted in WHO issuance of NIC status for EHNRI.

October - December 2007: **Laboratory Assessment and Training in Rwanda:** Represented CDC-Atlanta Influenza branch in Rwanda (Kigali) to establish a National Influenza Center (humans) and Animal Influenza testing lab at RARDA, Kigali. Coordinated training of lab staff.

- August 2007- February 2008. **Laboratory Assessment and Training in Uganda:** Joined the CDC-Atlanta Influenza branch in Uganda (Entebbe) to assist in establishment a National Influenza Center at the Uganda Virus Research Institute (UVRI). Coordinated training of lab staff to perform H5N1 testing and the provided proficiency panels and MDCK cell culture reagents and start-up cultures.
- November 2007: **Member of WHO Team** that developed: WHO Guide for national Public health Laboratory Networking to Strengthen Integrated Disease Surveillance and Response: Version 1.0. January 2008 (Other team members: Ndiokubwayo JB, Alemu W, Kebede S, Perry H, Alzouma YA, Yahaya A, Aisu T, Koumare B, Rugimbaya P, Mwansa, JCL, Biney EEO).
- March 9 – March 14 2008: **Co-coordinator of Training in Laboratory Diagnosis of Avian Influenza.** Joint WHO/CDC training for the 8 Countries with NICs (National Influenza Centers) WHO regional FLUNET laboratories in Africa. Training organized jointly with WHO-Africa region (WHO-AFRO) Attending countries included Uganda, Tanzania, Ethiopia, Nigeria, South Africa, Zambia, Rwanda, and Ghana.
- April 26 – April 30th, 2009. **Member of WHO Team** that developed guideline for preparedness for pandemic influenza for National Influenza centers worldwide. Geneva, Switzerland. See document developed.
- June 1 -4, 2009. **Training on novel 2009 H1N1** diagnosis by PCR in CDC-Kenya Nairobi. Countries that participated are Kenya, Uganda, Tanzania, Ethiopia, Rwanda, DRC, Nigeria, and Cote de Ivoire.
- August 3 -14, 2009. **Training on influenza virus isolation for NICs in Africa.** 15 Countries participated. 1st week for Anglophone countries and 2nd week for Francophone countries.

Course development

- 2001 - Developing and directing a graduate-level molecular virology course for the MVB graduate program (Co-director – Kay Faaberg). Course is team-taught with faculty from College of Veterinary Medicine and Department of Microbiology participating.
- 2001 - Co-developed a course of Ethics in Animal Research (Mark Rutherford- Co-director). - Course team-taught with faculty from College of Veterinary Medicine and Institutional Animal care and Use Committee, and Department Animal Sciences, University of Minnesota.
- 2005- Developed a course on fundamental laboratory methods for the FELTP-Kenya. The course was adopted by CDC for use in other countries developing FELTP training
- 2005 – Developed the course on laboratory management for FELTP-Kenya. The course was adopted by CDC for use in other countries developing FELTP training
- 2005 – Developed the course on laboratory policy and systems design for FELTP-Kenya. The course was adopted by CDC for use in other countries developing FELTP training.
- 2012 – Revised the field epidemiology and laboratory training program (FELTP) curriculum to incorporate One Health

E. STUDENT MENTORSHIP

1. **Xuezian Zhang** – **Post-doctoral fellow**, November 1999 – July 2001
Dr Zhang is presently an NIH postdoctoral fellow and the Minneapolis Veteran Affairs Hospital, Minneapolis
2. **Hyun-Jin Shin** – **PhD** in Virology (co-advisor- K.V. Nagaraja) –Graduated 2001
[Presently: Post-doctoral fellowship at Northwestern University, Chicago, IL and now is a Professor at South Korea University, Seoul, South Korea.
3. **Baldev Gulati** – **Post-doctoral fellow**, January 2000 – 2001 (co-advisor – S.M. Goyal).
Dr Gulati has since returned to India where he is working at a University.
4. **Laurie Brewer** – **PhD** in Molecular Veterinary Biosciences Program, August 1999-June 2004. GRADUATED. Presently: DVM Student, University of Minnesota, St Paul, MN. Graduated 2003
5. **Humphrey Lwamba** – MSc in Molecular Veterinary Biosciences Program, August 1999-November 2004. Graduated 2004.
7. **Richard Bennett** – **PhD** in Veterinary Medicine Program (Co-advisor D.A. Halvorson) – 2000 – 2005. Graduated 2005.
8. **Rebecca LaRue** – **MSc** in Comparative Biomedical Sciences Graduate Program. August 2003 – March, 2005. Graduated 2005
9. **Jessica Lynch** – **PhD** in Neuroscience Program (Co-advisor Al Beitz) – 2000 – 2005. Graduated 2006
10. **Suzanne Myers** – **PhD** in Veterinary Medicine, Pennsylvania State University (Co-advisor D.P. Shaw and B. Love). Presently: Research Associate, Animal Diagnostic Laboratory, Pennsylvania State University, State College, PA 16801. Graduated 2004.
11. **Clayton Onyango-MSc** in Biotechnology. Kenyatta University. Currently Research Fellow. British Medical Research Council, Gambia, West Africa. Graduated 2006.
12. **Anthony Ndirangu-MSc** in Biochemistry. Jomo Kenyatta University of Agriculture and Technology. Graduated, 2007.
13. **Tura Galgalo-MSc** in Laboratory Management and Epidemiology. Field Epidemiology and laboratory Training Program, Centers for Disease Control-Kenya. Currently Head Microbiology Reference Lab, NPLS, Kenya. Graduated 2006.
14. **John Mwhia-** **MSc** in Laboratory Management and Epidemiology. Field Epidemiology and laboratory Training Program, Centers for Disease Control-Kenya. Currently Head Reference Lab, NPLS, Kenya. Graduated 2006.
15. **Abdikher Dahiye - MSc** in Laboratory Management and Epidemiology. Field Epidemiology and laboratory Training Program, Centers for Disease Control-Kenya. Currently Head Microbiology Reference Lab, NPLS, Kenya. Graduated 2007.
16. **Alina Evans** – **MPH**. School of Public Health. Ocular signs in febrile patients presenting between Rift Valley fever outbreaks.. University of Minnesota, Minneapolis, Minnesota Graduated 2007.
17. **Melinda Rostal** – **MPH**. School of Public Health, An investigation of risks for infection of Rift Valley fever virus during inter-epidemic (August – December 2006) and epidemic (December 2006-January 2007) periods in Garissa, Kenya University of Minnesota, Minneapolis, Minnesota. Graduated 2007.
18. **Judith Muindi - MSc** in Laboratory Management and Epidemiology. Field Epidemiology and laboratory Training Program, Centers for Disease Control-Kenya.

National Public Health Laboratory service, Ministry of Health and Social Work-Kenya. Graduated 2008.

19. **Lali Mohamed - MSc** in Laboratory Management and Epidemiology. Field Epidemiology and laboratory Training Program, Centers for Disease Control-Kenya. National Public Health Laboratory service, Ministry of Health -Uganda. Graduated 2008.
20. **Fausta Mosha - MSc** in Laboratory Management and Epidemiology. Field Epidemiology and laboratory Training Program, Centers for Disease Control-Kenya. Prevalence of HIV drug resistance in Tanzania. Currently Head Diagnostic Services, Ministry of Health and Social Work-Tanzania. Graduated 2008.
21. **Maurice Ope - MSc** in Applied Epidemiology. Field Epidemiology and laboratory Training Program, Centers for Disease Control-Kenya. Prevalence of Influenza in Nyanza province, Kenya. Graduated 2008.
22. **Ahmed Abade - MSc** in Laboratory Management and Epidemiology. Field Epidemiology and laboratory Training Program, Centers for Disease Control-Kenya. Incidence of Hepatitis B virus among pregnant women in Kenya. Ministry of Health-Kenya. Graduated 2008.
23. **Leonard Nderitu - MSc** in Laboratory Management and Epidemiology. Molecular characterization of Rift Valley fever viruses during the 2006-2007 outbreak in East Africa. Field Epidemiology and laboratory Training Program, Centers for Disease Control-Kenya. Graduated 2009.
24. **Robert Gatata - MSc** in Laboratory Management and Epidemiology. Field Epidemiology and laboratory Training Program, Centers for Disease Control-Kenya. Ministry of Health-Kenya. Graduated 2009.
25. **Solomon Gikundi- MSc** Microbiology. Serologic and molecular characterization of type A influenza viruses circulating in Kenya. Institute for Tropical Medicine and Infectious Diseases (ITROMID), Kenya Medical Research Institute, Kenya. Graduated 2009.
26. **Victor Ombala - MSc** in Laboratory Management and Epidemiology. Molecular characterization of Human metapneumovirus (hMPV) from Kenya, 2006-2009. Field Epidemiology and laboratory Training Program, Centers for Disease Control-Kenya. Graduated 2012.
27. **Matthew Kyalo – MSc** in Laboratory Management and Epidemiology. Molecular characterization of Human metapneumovirus (hMPV) from Kenya, 2006-2009. Field Epidemiology and laboratory Training Program, Centers for Disease Control-Kenya. Graduated 2011.
28. **Lilian Mayieka - MSc** Microbiology. Tracking of novel H1N1 influenza virus genetic drift.. Institute for Tropical Medicine and Infectious Diseases (ITROMID), Kenya Medical Research Institute, Kenya. Ongoing.
29. **Alice N. Maina – PhD** in Microbiology. Institute for Tropical Medicine and Infectious Diseases (ITROMID), Jomo Kenyatta University of Agriculture and Technology. Kenya Medical Research Institute, Kenya. Graduated 2012.
30. **Peninah Munyua – PhD** in Epidemiology. Department of Public health, Pharmacology, and Toxicology, Faculty of veterinary Medicine, University of Nairobi, Nairobi, Kenya. ONGOING.
32. **David Ndeereh – PhD.** Department of Public health, Pharmacology, and Toxicology, Faculty of veterinary Medicine, University of Nairobi, Nairobi, Kenya. ONGOING.

33. **John Gachohi – PhD.** Predictive disease modeling for Rift Valley fever in East Africa. Developing a reliable model. ONGOING
34. **Thumbi Mwangi – Post-Doctoral.** Linked Human-Animal disease research, Washington State University, Pullman, WA. ONGOING
35. **Mark Nanyingi – PhD in Epidemiology.** Risk Mapping for Rift Valley fever in Kenya. Focusing on vector profiling for high and low risk district. University of Nairobi, Kenya. ONGOING
36. **Eric Osoro – PhD in Epidemiology** Transmission of Influenza virus from pigs to human among pig farmers in Kenya. Institute of Tropical Medicine and Infectious Diseases (ITROMID). Jomo Kenya University of Agriculture and Technology. ONGOING

F. INVITED SPEAKERSHIP AND RECOGNIZED PARTICIPATION IN SCIENTIFIC MEETINGS

November, 2000. Immunopathology of Theiler's virus-induced central nervous system demyelination. Microbiology, Immunology, and Molecular Pathology Program, University of Minnesota.

February 15th, 2000 - Clearance of Theiler's Murine Encephalomyelitis Virus from Cells of the Central Nervous System". Southeast Poultry Research Laboratory, United States Department of Agriculture. Atlanta, Georgia. [Host: Bruce Seal.]

May 20th, 2000. The Avian Pneumovirus Outbreak in U.S. Avian Research Center, University of Minnesota. [Host: Gary Duke]

December 14th, 2000. Pathogenesis of Picornavirus-induced Central nervous System Demyelinating Disease. Department of Microbiology and Pathology, Faculty of Veterinary Medicine, University of Nairobi, Kabete Campus. [Host P.N. Nyaga]

December 18th, 2000. Isolation and characterization of Avian Pneumovirus in United States. International Livestock Research Institute. Nairobi, Kenya [Host D.N. Mwangi]

September 24th, 2001. Health Care Condition in Kenya. College of St Benedict University, Minnesota. [Host: Ron Pagnucco]

November 7, 2001. Detection of neurological deficits in SJL/J mice having Theiler's murine encephalomyelitis virus-induced spinal cord demyelination. Neuroscience Graduate Program, University of Minnesota [Host – Hossein Fatemi]

April 26, 2002. Theiler's Virus Model of Multiple Sclerosis: Neurologic Deficits and Axonal Loss. Department of Neurology, University of New Mexico, Albuquerque. [Host: Dr Yoshio Okada, Director COBRE Center]

October 3rd to Oct 6th 2002. Role of the immune system in Theiler's virus-induced CNS demyelination. Society for Neuroimmune Pharmacology. Clearwater, FL [Host: Dr Phillip Peterson]

October 8, 2002. Plenary Session Speaker on "Sequence similarity between US Avian Pneumoviruses and human metapneumovirus." North Central Avian Disease Conference, Minneapolis. [Host; K.V. Nagaraja]

CHAIR, Virology Symposium of the North Central Avian Disease Conference, Minneapolis. Tuesday October 7th, 2002.

April 30th, 2003. Bortree Lecture Series, Pennsylvania State University. Xenotransplantation: Picornaviral Model of Pig-to-Mouse Zoonosis. [Host: Daniel P. Shaw].

May 29th, 2003. Texas A & M University. Theiler's Virus Model of central Nervous System Myelin Destruction. [Host: Louise Abbott].

July 24th, 2003. Center for Disease Control/Kenya Medical Research Institute, Kisumu. Role of Sex Hormones in Immune-mediated Central Nervous System Demyelination. [Host: Dr John Waitumbi]

February 28th, 2004. Poultry Management and Health Seminar/Northwestern Supply Company. Latest Research on Avian Pneumovirus in the U.S. St. Cloud, Minnesota. [Host: Dr. Mahesh Kumar].

September 13th, 2004. Women's Health Research Conference. Advancing Women's Health: Cultivating Interdisciplinary Research. Gender Differences in Severity of Multiple Sclerosis. University of Minnesota, Radisson Metrodome. [Host: Prof. Alvin Beitz].

March 13 – 15, 2005. **Chair**, United States' North Central Avian Disease Conference Organizing Committee. River center, St Paul, Minnesota. Theme: Threatening Poultry Respiratory Diseases.

October 7th, 2005. Discussion panel participant. ViroSeq HIV sequencing kit and software. In the: Workshop on ARV Resistance testing, Aga Khan University, Nairobi, Kenya.

November 2005. Update on the potential pandemic of H5N1 in Africa. 4th Training in Epidemiology and Public Health Interventions Network (TEPHINET) conference. Accra, Ghana.

November 8th, 2007. Rift Valley fever outbreak in East Africa 2006-07: A window into antibody kinetics, viral load and clinical presentation. American Society for Tropical Medicine and Health, Philadelphia, USA. Nov 4-8, 2007. [Host: R. Breiman]

December 5th, 2007. Plenary Lecture: Responding to Outbreaks of Viral hemorrhagic fevers in East Africa Region. At the 2nd Annual AFENET Conference, Kampala, Uganda.

March 11th, 2008. Plenary Lecture: Challenges of Setting up an Influenza Surveillance Laboratory in Africa. At the CDC/WHO regional NIC training, Entebbe, Uganda.[Host: M. Katz]

July 13 – 16, 2008: **Convener**-Viral Evolution and Genomics Seminar. American Society for Virology, Cornell University, Ithaca, New York.

April 15th, 2012: **Keynote Address**: The Role of Climate Change in Emerging Diseases: Faculty of Veterinary Medicine Biennial Conference, University of Nairobi, Kenya

January 16th, 2012: **Keynote Address**: Risk Mapping for Rift Valley fever in Kenya. GALVMED/SACIDS Annual Workshop. Dar Es salaam, Tanzania

April 27th, 2012: **Keynote address**: Changing Technologies In Biomedical Research. 50th Anniversary of the University of Nairobi Faculty of Veterinary Medicine, Safari Park, Nairobi.

June 8th, 2012: **Keynote Address**: One Health-From Vision to Action. The Africa Field Epidemiology Network (AFENET). One Health Fellowship Graduation Ceremony, Kampala Uganda.

June 13th, 2012: **Convener and Moderator**: One Health Initiatives in Eastern Africa. Regional Biosurveillance Workshop organized by US Cooperative Threat Reduction Agency, Department of defense.

G. GRANT REVIEWS

Ad hoc Reviewer – Minneapolis Medical Research Foundation

Reviewer – USDA/CSREES – Virology study group In Animal Health Section

Ad hoc Reviewer, National Pork Board, 2004

Ad hoc reviewer – Minnesota Agriculture Experiment Station – 2000 – 2001

Review Committee - Minnesota Agriculture Experiment Station – 2001 – 2004

Review Committee - Academic Health Center Faculty Development Grant – 2003

Review Committee – College of Veterinary Medicine Research Committee – 2003 - 2004

H. JOURNAL REVIEWS

Virus Research (ad hoc)

Journal of Neurovirology (ad hoc)

Viral Immunology

Journal of General Virology – 2003, 2004

Avian Disease – 2003 – 2004

J Immunology, 2005.

American Journal of Public Health

Vaccine

PLoS One

PLoS NTD

I. HONORS/ AWARDS

National Hofstad Award (presented by Iowa State University) for the best paper presented on poultry diseases. 74th Annual Meeting of the Conference of Research Workers in Animal Diseases. Chicago, Illinois. 8 - 9 November, 1993.

Bosworth Grier Fellowship for outstanding graduate student in pathobiology program, College of Agricultural Sciences, The Pennsylvania State University, 1994

2nd Place Award. The Pennsylvania State University 8th Annual Graduate Exhibition, 22nd - 23rd March, 1993, Life and Health Sciences Division.

Honorable Award. The Pennsylvania State University 9th Annual Graduate Research Exhibition, 25th - 26th March, 1994, Life and Health Sciences Division.

Annual Neurology Research Fellowship Award. Mayo Clinic and Foundation. **2000.**

McKnight Presidential Fellowship Award For The Most Promising Faculty. University of Minnesota, **2004.** Award consisted of research funding for 3 years.

CDC's James Virgil Peavy Workforce Development Award. For Significant contribution in building a new model for Field Epidemiology Training Program to integrate the training of epidemiologists with public health laboratorians. Centers for Disease Control and Prevention, Coordinating Office for Global health. **May 2009.**

J. PATENTS AND LICENSURE AGREEMENTS

Principal Inventor. Patent Application UM Docket Z00155. Highly sensitive and specific enzyme-linked immunosorbent assay for the diagnosis of avian pneumovirus. May 2000.

Principal Inventor. Licensure agreement and technology transfer. Matrix-protein-based ELISA for the diagnosis of avian pneumovirus. U of M and IDEXX Laboratories (10% Loyalties to U of M). June 2000.

Part of a team of inventors. Taqman PCR for the diagnosis of avian pneumovirus in turkeys. With Dr Kay Faaberg and Jim Collins, University of Minnesota Veterinary Diagnostic Laboratory. (Designed primers and participated in testing the specificity of the test).

Principal Inventor. Goose Avian pneumovirus isolate as a vaccinated against APV in turkeys. With David Halvorson, Kakambi Nagaraja, Richard Bennett. Under licensing contract negotiations with Lohman International. 2003

K. GRANTS AND MAJOR FINANCIAL SUPPORT

1. "Studies on Canine Parvovirus-2 Enteritis" University of Nairobi Deans Committee 1986-1987.
2. "Characterization and control of Canine Parvovirus-2 Strains in Kenya" University of Nairobi Deans Committee 1989-1990.
3. "Mechanism of virus-induced MHC class I antigen expression in the central nervous system". Mayo Clinic Research Services Grant 504-563-9904, 1996-1997. \$5,000 (Co-investigator with M. Rodriguez).
4. American Society for Virology postdoctoral travel grant 1996. For paper presentation in the 15th Annual Scientific Meeting in Ontario, Canada, July 1996.
5. "Immune promotion of remyelination" National Institutes of Health - Minority Supplement Grant NS24180, 1996-1997 (Salary support).
6. "Theiler's virus coding regions important in demyelination" National Institutes of Health, - Postdoctoral Grant NS10290, March 1997 – March 1999 (Salary support).
7. "The role of antiviral antibodies in controlling intracellular virus" University of Minnesota Grant-in-aid program. July 1999-December 2000 (\$20,681).
8. "Digital Imaging system" University of Minnesota Grant-in-Aid program (Equipment). December 1999 to December 2000 (\$20, 000).
9. "Molecular characterization and antigenic variation of avian pneumovirus" Minnesota Turkey Promotion Council, July 1999-December 2000 (\$93,631).
10. "Pathogenesis of avian pneumovirus infection in Turkeys" Minnesota Turkey Promotion Council, July 1999-December 2000 (\$63,475) (D. P. Shaw, PI) (5% effort).
11. "Bioecology, epidemiology and characterization of avian pneumovirus" Minnesota Turkey Promotion Council, July 1999-December 2000 (\$69,848) (K.V. Nagaraja, PI) (5% effort).
12. "Improved diagnostic and vaccination strategies against avian pneumovirus" Minnesota Turkey Promotion Council, July 1999-December 2000 (\$198,296) (S. Goyal, PI) (5% effort).
13. "Risk of porcine picornavirus in xenotransplantation" National Institutes of Health – KO1 Career Development Grant (HL04369), January 2000 – December 2003 (\$498,919 - Oct 2000 – Sept 2004).
14. "Risk of porcine encephalomyocarditis virus as a zoonosis". University of Minnesota Academic health Center Faculty Seed Grant. July 1 2000 – December 31, 2001 (\$25,581 direct).
15. "Determining whether porcine encephalomyocarditis virus persists in pig tissues or infect human cells" Minnesota Agricultural Experiment Station. July 1 2000 – December 31, 2001. (\$16,000-direct).
16. Generation of deletion mutant and recombinant vaccines for avian pneumovirus. Minnesota Research and Promotion Council. August 2000 – December 2001 (\$120,000)
17. Competitive matrix protein-based ELISA for detection of avian pneumovirus antibodies. Minnesota Turkey Research and Promotion Council. August 2000 – December 2001 (\$20,000)
18. Development of Reverse genetics Rescue System for Avian Pneumovirus. USDA/NRICGP/CSREES (Grant # 0102393). November 2001-October 2004 (275,000 direct) – Faaberg, K – Co-PI (3%).

20. Generation of deletion mutant and recombinant vaccines for avian pneumovirus. Minnesota Agriculture Rapid Response Funds and MN Turkey Research and Promotion Council. August 2001 – December 2002 (\$75,000)
21. Avian Pneumovirus Epidemiology: Studies on Cross Protection and Wild Bird Control. Minnesota Agriculture Rapid Response Funds and MN Turkey Research and Promotion Council. August 2001 – December 2003 Co-PI with David Halvorson (115,000)
22. Developing a Challenge Model for Experimental Avian Pneumovirus Infection. Minnesota Agriculture Rapid Response Funds and MN Turkey Research and Promotion Council. August 2001 – December 2003 Co-PI with David Halvorson (25,000)
23. Bioecology and Control of avian Pneumovirus. Minnesota Agriculture Rapid Response Funds and MN Turkey Research and Promotion Council. August 2001 – December 2003 Co-PI with Nagaraja KV and Halvorson DA (\$75,000)
26. High Speed Centrifuge and Ultracentrifuge – College of Veterinary Medicine Equipment Grant, June 2001 (\$50,900). For Departmental Development. Purchased high-speed centrifuge, JA-10 and JA-14 rotors, speedvac, and Beckman Coulter 1600 Scintillation counter for departmental use. COLLEGIATE EQUIPMENT GRANT
27. Studies on Molecular Epidemiology of Avian Pneumovirus in Midwest United States – Midwest Poultry Consortium, 60,000 (Halvorson DA, Zeman D, Dyer N, Nagaraja K, Co-PIs). March 2002 – March 2003
28. Use of goose isolate of avian pneumovirus (APV/Goose/MN-15a) as a vaccine in commercial turkeys. Rapid Agriculture Response Fund and Minnesota Turkey Growers Association. August 2002- Dec 2004. \$61,746 (Halvorson DA, Nagaraja KV-Co-PIs)
29. Continued Improvement of a Challenge Model for Experimental Avian Pneumovirus Infection. Minnesota Agriculture Rapid Response Funds and MN Turkey Research and Promotion Council. August 2002 – December 2004 Co-PI with David Halvorson (32,000)
30. Gel documentation (Eagle Eye) System. For Departmental Development. Purchased new and improved gel documentation equipment for departmental use. [Alley J –Co-PI] \$21,563 – COLLEGIATE EQUIPMENT GRANT
31. Development of a Real-time PCR Test for Avian Pneumovirus. USDA/ARS/SEPRL Collaborative Grant. October 2002- September 2004. (Halvorson DA- Co-PI). \$120,000
32. Comparison of Goose Isolate of Avian Pneumovirus (APV/Goose/MN-15a) vaccine and a commercially available APV vaccine. RARF/Minnesota Turkey Growers Association. \$56,000 – Direct (July 1, 2003 – Dec 31st, 2004).
33. Comparison of Goose Isolate of Avian Pneumovirus (APV/Goose/MN-15a) vaccine and a commercially available APV vaccine. Virogen Inc. \$24,670 – Direct (Sept, 2004 – Dec 31st, 2004).
34. International Emerging Infections Program Core Funding. \$1,200,000 per year –Direct Research Funds. 2006- Present.
35. An integrated epidemiological study of zoonotic pathogens in linked human and animal populations in rural Kenya" was successful. (Cleaveland S, Breiman RF, Co-PIs). Wellcome Trust –\$664,641-Direct (June 2007 –May 2011).
36. Epidemiologic Studies on Rift valley fever virus disease in Kenya. CDC/GDD Supplemental Funding. \$485,100 – Direct (2006-2009).
37. Purchase of Rift valley fever (RVF) virus vaccine for the control an RVF outbreak in Kenya: \$225,000 from USAID. (Breiman R, Feikin D, Co-PIs). December 2006.

38. Influenza virus surveillance in Kenya. Minnesota Center for Excellence in Influenza Research and Surveillance (MCEIRS). Collaboration with University of Minnesota. \$750 (2010 – 2013)(Munyua P, Cardona C-Co-PIs).
39. Field trials for Rift valley fever Clone 13 vaccine in livestock. Global Alliance for Livestock veterinary Medicines (GALMed). \$248K for 1 years (2011-2012). (Njenga MK, PI).
40. Studies on zoonotic disease in Kenya. US DOS/BEP \$1.5million over 3 years (2009 – 2012) (Njenga MK, PI).
41. CDC-Kenya Integrated Human-animal health (One Health) program. CDC/GDDER Division, Center for Global Health, Atlanta. \$600/yr from 2010 – Present.
42. Population-based animal syndromic surveillance in Lwak region, Western Kenya. Funded by the Paul Allen Foundation through the Washington State University, Pullman, WA (McElwain T, Palmer G as Co-PIs). \$400/year for 5 years (2012 -2016)
43. Epidemiology and laboratory diagnosis of Brucellosis in Kenya. CBEP/DTRA of the US/DOD. \$1.1 million over 2 years (2012 – 2014).
44. Operationalizing Zoonosis Disease Unit in Kenya. CBEP/DTRA of the US/DOD. \$200/yr for 3 years.
45. Risk mapping for Rift valley fever disease-Vector profiling in high and low risk districts in Kenya. Funded by Biosecurity Engagement Program, US/DOS. \$234K (2012-2014).
46. Organizaing a Regional (East Africa) Workshop on Priority Zoonotic Diseases. Funded by CBEP/DTRA of US/DOD. \$170K (2013-2014).
47. Decentralizing One Health to County and District Levels. Funded by Biosecurity Engagement Program, US/DOS. \$100K (2013-2014).

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2. Kariuki Njenga, M., Nyaga P.N., Buoro, I.B.J., and Gathumbi, P.K. Effectiveness of fluids and antibiotics as supportive therapy of canine parvovirus-2 enteritis in puppies. *Bull. Anim.Hlth. Prod. Afr.* 39:72-77, 1991
3. Kariuki Njenga, M., Nyaga, P.N., Buoro, I.B.J., and Gathumbi, P.K. Use of hyperimmune serum as a prophylaxis in puppies incubating CPV-2 enteritis infection. *Bull. Anim. Hlth. Prod. Afr.* 39:97-103, 1991.
4. Kariuki Njenga, M., and Nderitu, E.M. Otitis externa: Prognosis following surgery. *Bull Anim. Hlth. Afr.* 39:195-197, 1991.
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10. Kariuki Njenga, M., and Dangler, C.A. Endothelial MHC class II expression and endarteritis in Marek's disease virus-infected chickens. *Vet Pathol* 32:403-411, 1995.
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ABTRACTS

M. Kariuki Njenga has co-authored over 260 abstracts in international meetings.