BIOGRAPHICAL SKETCH

NAME: Beatriz Martinez Lopez

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

POSITION TITLE: Professor, AES (20%); Director of the Center for Animal Disease Modeling and Surveillance

EDUCATION/TRAINING

Institution and Location	Degree	Completion Date	Field of Study
School of Veterinary Medicine, University Complutense of Madrid (UCM), Spain	DVM	09/2004	Veterinary Medicine
School of Information Sciences, UCM, Spain	"Expert"	06/2005	Communication and social networks
University of California, Davis	MPVM	09/2007	Veterinary Epidemiology
School of Veterinary Medicine, UCM, Spain	PhD	01/2009	Veterinary Epidemiology

A. Personal Statement

My research is focused on the development and application of models and epidemiological tools for supporting more cost-effective and risk-based surveillance and control strategies. I have been extensively working on epidemiological modeling, spatio-temporal analyses and risk assessment for the evaluation of the potential introduction and/or spread of diseases affecting domestic and/or wild animal populations such as African swine fever, foot-and-mouth disease, classical swine fever, Aujeszky´s disease, African horse sickness, bluetongue, avian influenza, West Nile, Rift Valley Fever, bovine tuberculosis, porcine reproductive and respiratory syndrome, etc. Many of those diseases are zoonotic and considered to be emerging or re-emerging due to globalization, climate and land use changes. Since 2013, I have assumed the direction of CADMS to lead the development of innovative, operational, translational decision-support tools such as the Disease BioPortal™, a secure web-based platform system intended for real-time routing, sharing, and analyzing infectious diseases data and information (http://bioportal.ucdavis.edu/). One of my priority research lines is on the use of Big Data analytics applied for early detection of diseases and risk assessment and modeling of the global emergence of re-emergence of infectious diseases. I currently mentor more than 10 PhD students and post-doctoral scholars and teach and coordinate numerous graduate courses at UC Davis including "Applied Epidemiology Problem Solving", "Concepts and Methods in infectious disease surveillance and control", "Ecological and Health Risk Analysis", "Spatial Epidemiology" and "Epidemiology Seminars" for the Master of Preventive Veterinary Medicine (MPVM) and Graduate Group of Epidemiology (GGE) at UC Davis. I also conduct frequent workshops and technology transfer activities related with quantitative epidemiology, risk assessment and modeling to train veterinary services and other public health authorities, including the annual reception of visitor scholars and researchers at CADMS. These training, mentoring and technology transfer activities have been directed mainly to promote collaborations with different African, South American and Asian countries and this contribution has led CADMS to be recognized as FAO Reference Center for Veterinary Epidemiology.

B. Positions, professional activities and Honors

Positions and Employment

- 2020- current: Professor, University of California, Davis
- 2016-2020: Associate Professor, University of California, Davis
- 2013-2016: Assistant Professor, University of California, Davis
- 2011-2013: Juan de la Cierva Researcher, IREC-CSIC-University of Castilla-La Mancha,Spain
- 2009-2011: Post-Doctoral Researcher, VISAVET, SVM, UCM, Spain

Honors (Last 5 years)

- 2018 – Chancellor's Fellow
- 2015 - PRRS Research Award. Announced at the AASV Conference, Orlando, US.
- 2013 - Award for the Organization of the SVEPM Annual Meeting. 6th Recognition Night organized by Madrid City Council's Visitors & Convention Bureau (City Hall, Madrid, Spain)

- 2010 – Independent Expert Evaluator, European Commission, Belgium

Invited keynote presentations (5 most relevant in past 4 years of 27)
- Big Data and smart-connected epidemiology in practice: the value for prevention and control of infectious diseases. Conference of Research Workers in Animal Diseases (CRWAD). Chicago, USA. Dec 4, 2018.
- Practical applications of Disease Bio-Portal: how next generation of Animal Health Surveillance and Information Systems solve problems using real-time Big Data visualization and analytics, USAHA Committee on Animal Health Surveillance and Information Systems. USAHA/AAVLD annual meeting. San Diego, California. Oct 15, 2017
- Methodologies to evaluate the risk of introduction and spread of Foot-and-Mouth disease, 43th Ordinary meeting of the South American Commission for the control of Foot-and-Mouth Disease - COSALFA promoted by the Pan-American Foot-and-Mouth Disease Center (PANAFTOSA) of the Pan-American Health Organization/World Health Organization (PAHO/WHO). Punta del Este, Uruguay. Apr 4, 2016
- Real-time surveillance and risk assessment using Big Data analytics: the future of African swine fever (and other diseases) prevention and control, FAO African Swine Fever (ASF) Prevention and Control Forum, Beijing, China, Nov 25, 2015
- Using the Disease BioPortal to monitor swine viral diseases, Symp. of Comp.Resources for Swine Viral Diseases, USDA-National Centers for Animal Health, Iowa. Jun 9, 2015

Member of scientific committees
2017-cont. Member -USAHA Committee on Foreign and Emerging Diseases
2017-cont. Member - AAVLD Epidemiology Committee
2017-cont. Member -Advisory committee of the European ENETWILD EFSA project
2017-cont. Member -OFFLU (OIE-FAO) applied epidemiology working group
2009-cont. Member-Scientific Committee of the Research Centre for the Management of Agricultural and Environmental Risks (CEIGRAM).
2014-cont. Member-Executive Committee of the Iberoamerican Society of Veterinary Epidemiology & Preventive Medicine (SIEVMP). Regional Representative, Central & North America
2017-2019. Chair -GEOVET 2019 Organizing Committee
2018-2019 Member -CRWAD Program Committee
2014-2015 Member -Scientific Committee and Reviewer, International Symposium of Veterinary Epidemiology & Economics (ISVEE)
2009-2011 Member-Regional Representative, Europe, Executive Committee of the SIEVMP
2010 Member-Organizing Committee of the workshop "New generation researchers in pig viral diseases: building bridges from labs to policy and the farms". Vet. School, UCM, 12-14 Jul, Madrid, Spain
2011-2012 Member-Organizing and Scientific Committee of the IX International Congress of Veterinary Virology. 4-7 Sept, Madrid, Spain.
2012-2013 Chair-Organizing Committee of the Annual Meeting of the Society for Veterinary Epidemiology and Preventive Medicine (SVEPM) in Madrid, Spain.

Member of Scientific Societies
2009-2012 Spanish Society of Epidemiology (SEE)
2009-cont. Iberoamerican Society of Veterinary Epidemiology and Preventive Medicine (SIEVMP)
2009-cont. European Society of Veterinary Virology (ESVV)
2012-cont. Society of Veterinary Epidemiology and Preventive Medicine (SVEPM).
2013-cont. United States Animal Health Association (USAHA).
2014-cont. Association for Veterinary Epidemiology and Preventive Medicine (AVEPM).

Editorial Board and Reviewer
Associate Editor of BMC Veterinary Research
Associate Editor of Frontiers in Veterinary Science
Board Member of Study Design and Data Analysis for Equine Veterinary Journal

Reviewer of scientific papers for Preventive Veterinary Medicine, Scientific Reports, PLoS One, PLos Neglected Tropical Diseases, Transboundary and Emerging Diseases, Risk Analysis, Frontiers in Veterinary Science, BMC Veterinary Research, Equine Veterinary Journal
Ad hoc reviewer for the following agencies: US Department of Agriculture, National Science Foundation (NSF), Swiss National Science Foundation (SNSF), National Pork Board (NPB).

C. Contribution to Science

1. Risk assessment, spatial epidemiology and modeling of transboundary and emerging infectious diseases

My work has been primarily focused to better understand the epidemiology of transboundary, emerging and re-emerging diseases and provide reliable risk estimates to inform risk-based, more cost-effective preventive and control strategies. This work has been conducted generally in collaboration with national and international governments and organizations (e.g., Ministry of Agriculture, Ministry of Health, National Livestock Insurance System, FAO, OIE, etc.) which has led to advances in knowledge but also to changes in policies and improvement of disease prevention and control programs.

*Belkhiria J, Lo MM, Sow F, **Martínez-López B**, Chevalier V. Application of exponential random graph models to determine nomadic herders' movements in Senegal. Transbound Emerg Dis. 2019 Jul;66(4):1642-1652.

Amirpour Haredasht S, Tavornpanich S, Jansen MD, Lyngstad TM, Yatabe T, Brun E, **Martínez-López B**. A stochastic network-based model to simulate the spread of pancreas disease (PD) in the Norwegian salmon industry based on the observed vessel movements and seaway distance between marine farms. Prev Vet Med. 2019 Jun1;167:174-181.

Martínez-López B, Alexandrov T, Mur L, Sánchez-Vizcaíno F, Sánchez-Vizcaíno JM, (2014). Evaluation of the spatial patterns and risk factors, including backyard pigs, for classical swine fever occurrence in Bulgaria using a Bayesian model. *Geospat Health*;8:489-501.

Martínez-López B, Ivorra B, Ramos AM, Sánchez-Vizcaíno JM. A novel spatial and stochastic model to evaluate the within- and between-farm transmission of classical swine fever virus. I. General concepts and description of the model. Veterinary microbiology. 2011; 147(3-4):300-9.

Martínez-López B, Perez AM, Sánchez-Vizcaíno JM. (2010). A simulation model for the potential spread of foot-and-mouth disease in the Castile and Leon region of Spain. *Prev Vet Med*.;96:19-29.

2. Adaptation and development of new quantitative methods to the area of veterinary epidemiology

I have also significantly contributed to the development and adaptation for veterinary epidemiology of novel approaches and advanced methods that have shown a great value in other areas of science (i.e., social sciences, geostatistics, applied mathematics, computer science). For example, our review on Social Network Analysis applied to preventive veterinary medicine, which has been highly cited, contributed to the better understanding and exponential use of network analysis and graph theory into the field of veterinary epidemiology. I also proved the value of using multi-analysis, mechanistic and data-driven approaches (e.g., geostatistics+network methods+epidemiologic and economic modeling) to provide a more holistic understanding of complex epidemiological problems.

Belkhiria J, Alkhamis MA, **Martínez-López B**. (2016). Application of Species Distribution Modeling for Avian Influenza surveillance in the United States considering the North America Migratory Flyways. *Sci Rep*. 14;6:33161.

Martínez-López B, Ivorra B, Fernández-Carrión E, Perez AM, Medel-Herrero A, Sánchez-Vizcaíno F, Gortázar C, Ramos AM, Sánchez-Vizcaíno JM. (2014). A multi-analysis approach for space-time and economic evaluation of risks related with livestock diseases: the example of FMD in Peru. *Prev Vet Med*.;114:47-63

*Lee K, Polson D, Lowe E, Main R, Holtkamp D, **Martínez-López B**. Unraveling the contact patterns and network structure of pig shipments in the United States and its association with porcine reproductive and respiratory syndrome virus (PRRSV) outbreaks. Prev Vet Med. 2017; 138:113-123.

Martínez-López B, Perez AM, Sánchez-Vizcaíno JM (2009). Social network analysis. Review of general concepts and use in preventive veterinary medicine. *Transbound Emerg Dis*.;56(4):109-20.

Martínez-López, B., Perez, A., Sánchez-Vizcaíno, J. (2009). Combined application of social network

and cluster detection analyses for temporal-spatial characterization of animal movements in Salamanca, Spain. *Prev Vet Med, 91* 29-38.

3. Contribution to the better understanding of the epidemiology of zoonotic diseases, including vector-borne diseases, using innovative, One-Health, approaches

Berrian AM, **Martínez-López B**, Quan V, Conrad PA, van Rooyen J, Simpson GJG, Frean J, Weyer J, Rossouw J, Knobel D, Blumberg L (2019). Risk factors for bacterial zoonotic pathogens in acutely febrile patients in Mpumalanga Province, South Africa. Zoonoses Public Health. doi: 10.1111/zph.12577

LaHue NP, Baños JV, Acevedo P, Gortázar C, **Martínez-López B**. (2016). Spatially explicit modeling of animal tuberculosis at the wildlife-livestock interface in Ciudad Real province, Spain. *Prev Vet Med*; 128:101-11.

Sánchez-Vizcaíno F, **Martínez-López B**, Sánchez-Vizcaíno JM. (2013). Identification of suitable areas for the occurrence of Rift Valley fever outbreaks in Spain using a multiple criteria decision framework. *Vet microbiol*. 165:71-8.

Durand B, Lecollinet S, Beck C, **Martínez-López B**, Balenghien T, Chevalier V. (2013). Identification of hotspots in the European union for the introduction of four zoonotic arboviroses by live animal trade. *PloS one*; 8(7):e70000.

Martínez-López B, Perez AM, Sánchez-Vizcaíno JM. (2011). Identifying equine premises at high risk of introduction of vector-borne diseases using geo-statistical and space-time analyses. *Prev Vet Med*; 100:100-8.

*Complete list of peer-reviewed publications (>98 peer-reviewed publications, 2850 citations; h-index=28; i10-index=62) is accessible through MyBibliography [NCBI]:
https://www.ncbi.nlm.nih.gov/myncbi/1NqauuaTjqskn/bibliography/public/

D. Research Support
Ongoing Research Support

1. **USDA-NIFA:EEID**, Unravelling the effect of contact networks and socio-economic factors on the evolution, emergence and spread of infectious diseases at the wildlife-domestic interface, 1/1/2019-12/31/2022 (Principal Investigator)
2. NSF, BIGDATA:IA, A multi-level approach for global optimization of the surveillance and control of infectious disease in the swine industry, 1/1/2019- 12/31/2022 (Principal Investigator)
3. NSF, Convergence Accelerator – Track D: Data-driven disease control and prevention in Veterinary Health, 9/1/2020 – 5/31/2021 (Principal Investigator)

Completed Research support

1. National Pork Board, Linking veterinary diagnostic laboratory submissions and corresponding PEDV test results to spatiotemporal mapping tools: the future of disease management, control and elimination, 12/01/2013 - 03/01/2015 (Principal Investigator at UCD - subcontract from ISU, PI Rodger Main)
2. Boehringer Ingelheim Vetmedica Inc. BioPortal Support Gift, 06/01/2011 - 12/31/2019 (Principal Investigator)
3. UC Davis: Center for Equine Health, Genomic characterization of ECoV strains from foals and adult horses, 1/1/2020–12/31/2020 (Co-Principal Investigator)
4. UC Davis: Center for Food Animal Health: Hatch funds. Evaluation of cow hygiene and cow activity at dry-off as a tool to improve the selection of low SCC cows eligible for Selective Dry Cow Therapy. 10/1/2019-9/30/2020 (Co-Investigator)
5. Animal Health and Veterinary Laboratories Agency (AHVLA), SOW: Web-based system for surveillance of infectious animal diseases in the European Union, 07/01/2014 - 12/31/2014 (Principal Investigator)
6. Universidad Complutense, Development and maintenance of the ASF News web-service, 07/01/2014 - 12/20/2016 (Principal Investigator)
7. UC Davis: Center for Food Animal Health: Formula Funds, Spatial and temporal distribution and the implementation of a near real-time surveillance system for infectious hematopoietic necrosis virus (IHNV) infection in California, 10/01/2014 - 09/30/2015 (Principal Investigator)

8. UC Davis: Center for Food Animal Health: Formula Funds, Needs assessment in small-scale farms and urban animal agriculture in Western States, 10/01/2014 - 09/30/2015 (Co-Principal Investigator)
9. UC MEXUS-CONACYT, Epidemiological evaluation of the spatio-temporal patterns and risk factors contributing to the incidence of White Spot Syndrom Virus (WSSV) and the Acute Necrosis of Hepatopancreas Syndrome (ANHS) in whiteleg shrimp (Litopenaeus vannamei) in Sinaloa state, Mexico, 07/01/2014 - 12/31/2015 (Principal Investigator)
10. Boehringer Ingelheim Vetmedica Inc. Evaluating the role of direct (i.e., animal contacts) and indirect (i.e., airborne) transmission of different PRRSV genotypes within and between different swine production systems in the US. 04/01/2015 - 03/01/2016 (Principal Investigator)
11. UC Davis: Academic Senate. Development of an early-warning system based on real-time risk assessment for the prevention and rapid control of Avian influenza in California poultry industry, 07/01/2015 - 06/30/2016 (Principal Investigator)
12. UC Davis: Center for Food Animal Health: Hatch Funds. Evaluation of the prevalence and persistence of Shiga toxin-producing E. coli (STEC) on organic mixed crop-livestock farms that integrate sheep grazing within vegetable fields, 10/01/2015 - 09/30/2016 (Co-Principal Investigator)
13. CEEZAD-KSU, Real-time risk assessment platform for evaluating the risk of African Swine Fever (ASF) introduction into the United States, 01/01/2016 - 12/31/2016, (Principal Investigator)
14. SINTEF and Norwegian Veterinary Institute, Network analysis to identify important factors for managing zones, 1/1/2015–12/31/2018 (Principal Investigator)
15. USDA-NIFA-CARE, Development of an early-warning system based on real-time risk assessment, producers self-assessment of biosecurity practices for the prevention, early detection and rapid control of AI outbreaks in the CA poultry industry, 4/1/2016–3/31/2018 (Principal Investigator)
16. USDA, Multi-regional risk analysis of farm manure use: Balancing soil health and food safety for organic fresh produce production, 9/1/2016–8/31/2020 (Co-Investigator)
17. Iowa State University, Collaborative Research Agreement between ISU and UCD, 4/1/16– 3/30/2018 (Principal Investigator)
18. UC Davis: Academic Federation, Evaluation of the interface between feral pigs and pasture –raised pigs, a multi-agency epidemiological approach: Implications for infectious disease transmission and surveillance, 7/1/2016–6/30/2018 (Co-Investigator)
19. UC Davis: Center for Food Animal Health: Hatch funds, Retrospective analysis of viral infections in hatcheries of the California Department of Fish and Wildlife and development of an online database and visualization platform to support disease surveillance, 1/1/2018-8/30/2018 (Principal Investigator)
20. Global Affairs-UCD, EPI-4-HEALTH: International Collaboration and Training partnership in epidemiology and eHealth to better prevent and control neglected and emerging diseases in Latin America, 3/6/2017–3/31/2018 (Principal Investigator)
21. UC Davis: Center for Equine Health, Temporal and spatial phylogeny of H3N8 equine influenza virus in the USA (2006-2016), 8/1/2017–7/31/2018 (Principal Investigator)
22. UC Davis: Academic Senate, Investigating raccoon abundance, home range and Baylisascaris probyonis prevalence in Yosemite National Park and its association with human occupancy in Yosemite Valley, 7/1/2017–9/30/2018 (Principal Investigator)
23. UC Davis: Center for Food Animal Health: Hatch funds, Risk assessment of Brucella abortus introduction into California and cost-effectiveness evaluation of the current brucellosis vaccination program, 10/1/2017-9/30/2018 (Principal Investigator)
24. UC Davis: Center for Food Animal Health: Formula Funds, Modeling the economic impact of fire events in livestock production in California, 10/1/2017-9/30/2018 (Principal Investigator)
25. UC Davis: Center for Food Animal Health: Formula Funds, Modeling the impact of multiple vaccination strategies for FMD in California for Emergency planning and preparedness, 10/1/2017-9/30/2018 (Principal Investigator)