BIOGRAPHICAL SKETCH

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NAME: Mena (Crabtree), Kristina D.

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

POSITION TITLE: Associate Professor and Program Head of Environmental and Occupational Health Sciences at UTHealth School of Public Health; Interim Dean of El Paso Campus

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
Franklin College, Franklin, IN	B.A.	1991	Biology, English
University of South Florida, Tampa, FL	M.S.P.H.	1993	Environmental Sciences
The University of Arizona, Tucson, AZ	Ph.D.	1996	Environmental Microbiology
Kansas State University, Manhattan, KS	Post-Doc Fellow	1997	Environmental Epidemiology

A. Personal Statement

I am an environmental scientist with over 20 years of research experience in human health risk assessment, water quality, and food safety. I use risk assessment and epidemiological approaches to translate field and laboratory data to human health impact, and communicate such findings in ways meaningful among diverse audiences. My work has developed risk assessment methodologies to address household and occupational exposures, hospital and farm environments, and various types of waters, air and surfaces. In addition, I used risk assessment to predict flight crew health risks at the International Space Station (ISS) associated with the ISS potable water system and food supply. More recently, I conducted the risk assessment that informed the health issues associated with Olympians, tourists and residents at the 2016 Olympics in Rio. The output of these risk assessments have been used to develop and implement risk mitigation strategies.

My role in UTEP's *Border Biomedical Research Center* (BBRC) is as Community Engagement Co-Director. My overall responsibility will be to foster community-partnered activities within the BBRC. My experience in risk assessment as a translational research tool includes innovative ways to involve community stakeholders.

B. Positions and Honors

Positions

2016-present *Interim Dean*, El Paso Campus, The University of Texas Health Science Center at Houston (UTHealth) School of Public Health

2014 *Acting Dean*, El Paso Campus, The University of Texas Health Science Center at Houston (UTHealth) School of Public Health

2010-present *Program Head*, Environmental and Occupational Health Sciences, Division of Epidemiology, Human Genetics and Environmental Sciences, The University of Texas Health Science Center at Houston (UTHealth) School of Public Health

2009-present *Associate Professor (with tenure)*, Environmental and Occupational Health Sciences, Department of Epidemiology, Human Genetics and Environmental Sciences, The University of Texas Health Science Center at Houston (UTHealth) School of Public Health

2001-2008 *Assistant Professor of Environmental Sciences,* The University of Texas Health Science Center at Houston (UTHealth) School of Public Health

Honors

United States Environmental Protection Agency Chartered Science Advisory Board, 2016-2019
United States Environmental Protection Agency Drinking Water Committee, 2016-2019
El Paso Public Service Board, 2016-2019
United States Environmental Protection Agency Chartered Science Advisory Board, 2013-2016
United States Environmental Protection Agency Drinking Water Committee, 2013-2016
Keynote Speaker, The Groundwater Foundation Annual Symposium, 2006
American Academy of Microbiology Colloquium, American Society of Microbiology, 2006
Best Paper of the Year Award, *Journal of the American Water Works Association*, 2005

C. Contributions to Science

In the 1970s, the United States Environmental Protection Agency used a risk assessment paradigm to address potential health consequences associated with exposure to chemicals in the environment. In some cases, the chemical agent was not known to be hazardous to humans. In the 1990s, this basic risk assessment framework evolved to address the role of environmental microorganisms as disease-causing agents. The method evolved to what is now known as Quantitative Microbial Risk Assessment (QMRA), with early publications describing how QMRA can predict adverse health outcomes within populations in place of costly, and sometimes logistically limiting, epidemiological studies. QMRA has shown to be effective in associating pathogens with both waterborne and foodborne disease outbreaks, as well as pathogen transmission via air and surfaces. In addition, QMRA can be used to identify effective risk mitigation strategies and interventions, and develop regulatory guidelines. The following papers provide examples of QMRA's early evolvement, as well as more recent applications:

Gerba, C.P., J.B. Rose, C.N. Haas and **K.D. Crabtree**. 1996. Waterborne rotavirus: a risk assessment. *Water Research* 30:2929-2940.

Crabtree, K.D., C.P. Gerba, J.B. Rose and C.N. Haas. 1997. Waterborne adenovirus: a risk assessment. *Water Science and Technology* 35:1-6.

Mena, K.D. and S.D. Pillai. 2008. An approach for developing quantitative risk-based microbial standards for fresh produce. *Journal of Water and Health* 6(3):359-364.

Perez, V., **K.D. Mena**, H.N. Watson, R.B. Prater and J.I. McIntyre. 2015. Evaluation and quantitative microbial risk assessment of a unique antimicrobial agent for hospital surface treatment. *American Journal of Infection Control* 43:1201-1207.

QMRA has also contributed to the identification of a range of adverse health outcomes associated with environmental pathogens. Traditionally, waterborne and foodborne pathogens are associated primarily with acute, gastrointestinal episodes. Research applying QMRA has linked these pathogens to a variety of health

consequences, including more chronic conditions. The paper addressing health risks associated with waterborne coxsackievirus listed below illustrated this waterborne agent's connection to diabetes and heart disease. The paper won Best Paper of the Year Award, as it created an awareness within the water industry of the public health significance of this common, waterborne virus. Along with the adenovirus and coxsackievirus risk papers, a risk assessment of *Pseudomonas* linked this agent to the largest range of adverse human health outcomes, as well as associated it to a variety of exposure routes and sub-populations:

> **Mena, K.D.**, C.P. Gerba, C.N. Haas and J.B. Rose. 2003. Risk assessment of waterborne coxsackievirus. *Journal of the American Water Works Association* 95(7):122-131.
>
> **Mena, K.D.** and C.P. Gerba. 2009. Risk assessment of *Pseudomonas aeruginosa* in water. *Reviews in Environmental Contamination and Toxicology* 201:71-115.
>
> **Mena, K.D.** and C.P. Gerba. 2009. Waterborne adenovirus. *Reviews in Environmental Contamination and Toxicology* 198:133-167.

Direct and indirect potable reuse is becoming a popular option for communities to explore as part of a water conservation regimen, particularly in areas where drinking water supplies are scarce. QMRA can be used to evaluate associated health effects with this technology. The following paper addresses reclaimed water risks associated with protozoan parasites:

> Ryu, H., A. Alum, **K.D. Mena** and M. Abbaszadegan. 2007. Assessment of the risk of infection by *Cryptosporidium* and *Giardia* in non-potable reclaimed water. *Water Science and Technology* 55(1-2):283-290.

The National Aeronautics and Space Administration (NASA) continues researching ways to maintain optimal living conditions for flight crew at the International Space Station (ISS). Through a research partnership, my work was the first to develop risk models and apply QMRA to address water quality and food safety at the ISS. This work also led to a study that evaluated the usefulness of QMRA to address ISS surface sanitation and air quality. The ultimate goal of sending flight crew to Mars underpinned the objectives of all of this research.

Engaging the community has not traditionally been part of basic science research. I have been able to integrate my basic science training with my experience working with communities along the U.S.-Mexico border to foster improved understanding among researchers in the Region of what is important to community stakeholders in terms of research questions to be addressed in the laboratory. I currently serve as the Community Engagement co-Director of UTEP's NIH-funded Border Biomedical Research Center (BBRC), where I work with members of the community to help them inform research directions of the BBRC. This concept was presented at the National Institute on Minority Health & Health Disparities Grantees' Conference in 2014:

> A Basic Scientist's Evolution to Community Engaged Research: Lessons Learned. Poster Presentation by **K.D. Mena** and S. Davis. National Institute on Minority Health & Health Disparities Grantees' Conference. Transdisciplinary Collaborations: Evolving Dimensions of US and Global Health Equity. National Harbor, Maryland. December 1-3, 2014.

D. Additional Information: Research Support and/or Scholastic Performance

<u>On-going Research</u>

<u>Co-Director, Community Engagement Core</u>. *Border Biomedical Research Center (BBRC)*, University of Texas at El Paso (UTEP), National Institutes of Health, Project period: 07/01/14-06/30/19. I co-direct the Community

Engagement Core with UTEP faculty. In this role, I work with a diverse group of faculty investigators and community stakeholders to foster their collaboration in designing research questions and projects.

Completed Research

Co-Principal Investigator. *Transdisciplinary Research Consortium for Gulf Resilience on Women's Health (GROWH)* (Tulane), National Institutes of Health, Project period: 07/01/11-06/30/16. In this project, I contributed to the analysis of a risk perception survey administered to Gulf Coast residents experiencing the aftermath of an oil spill.

Principal Investigator, *Microbial Risk Assessment at the ISS: Data Needs and Methods to Quantify Health Risks Associated with Microorganism Exposures via Air and Surfaces*, National Aeronautics and Space Administration, Project period: 06/15/14-08/15/14. As PI, the use of QMRA as a tool to quantify flight crew health risks associated with exposure to air and surfaces at the International Space Station was explored.