

Celeste Vallejo

Mathematical Biosciences Institute
The Ohio State University
Jennings Hall 3rd Floor, 1735 Neil Ave.
Columbus, OH 43210

Email: vallejo.26@osu.edu
Website: celestevallejo.github.io
Phone number: (614) 688-3443

RESEARCH INTERESTS mathematical modeling in biology, stochastic processes, and Little's Law

ACADEMIC APPOINTMENTS **Mathematical Biosciences Institute at The Ohio State University,**
co-sponsored by Battelle Memorial Institute, Columbus, OH
Postdoctoral Fellow **September 2018 - present**

EDUCATION **University of Florida, Gainesville, FL**

- **PhD, Mathematics** **2018**
 - Advisor: James Keesling, Professor of Mathematics, University of Florida
 - Thesis title: "Some Techniques for Analyzing Stochastic Models with Application to Epidemiology"
- **MS, Mathematics** **2015**
 - Advisor: James Keesling, Professor of Mathematics, University of Florida
 - Thesis title: "Little's Law Applied to a Stochastic Model of Poliomyelitis"
- **BA, Mathematics** **2013**
 - Advisor: James Keesling, Professor of Mathematics, University of Florida
 - Thesis title: "Epidemiology of MdSGHV in *Musca domestica*"

RESEARCH EXPERIENCE **Research Assistant** **January 2017 - August 2018**
University of Michigan (remote hire)

- Assistant to James Koopman, Professor of Epidemiology, University of Michigan
- Constructing an event-driven individual-based model of polio transmission and silent circulation that includes the environment as a source of contamination
 - Creating an immuno-epidemiological partial differential equations model (includes between-host and within-host dynamics) to support the development of the individual-based model
- This is joint work with Thomas Hladish, University of Florida

Research Assistant **January 2017 - August 2018**
Department of Emergency Medicine, University of Florida

- Assistant to J. Adrian Tyndall, Chairman, Department of Emergency Medicine, UF Health
- Perform data analytics that facilitate developing the yearly budget for the Emergency Department

Research Assistant**August 2013 - May 2018***Department of Mathematics, University of Florida*

- Assistant to James Keesling, Professor of Mathematics, University of Florida
- Projects include:
 - *Silent Circulation of Poliovirus in Small Populations*
 - * This project uses a stochastic microsimulation model to demonstrate the potential of long periods (greater than 5 years) of silent circulation of poliovirus in small populations in the absence of vaccination
 - * This is joint work with Burton Singer and James Koopman
 - *Using Little's Law in Stochastic Modeling*
 - * This project focuses on a theoretical development of a Little's Law analysis of stochastic processes
 - * We are able to analyze a stochastic network without the usual Markov assumptions
 - *The Spread of Aerosolizable Nosocomial Pathogens through the Air*
 - * We identified the air as a significant contributor to the spread of pathogens in a hospital
 - * We quantified the relative number of pathogens spread by the air versus through hand-touch sites
 - * This is joint work with Louis Block, Jo Ann Lee, Ross Ptacek, Nicole Iovine, and J. Glenn Morris, Jr.

PUBLICATIONS **Celeste Vallejo**; Carl A. B. Pearson; James Koopman; Thomas Hladish. Evaluating the probability of silent circulation of polio in small populations using the silent circulation statistic. (submitted)

Celeste Vallejo; James Keesling; James Koopman; Burton Singer. Silent Circulation of Poliovirus in Small Populations. *Infectious Disease Modelling* **2017**, doi: 10.1016/j.idm.2017.11.001.

Josh Hiller; **Celeste Vallejo**; Leo Betthausen; James Keesling. Characteristic patterns of cancer incidence: Epidemiological data, biological theories, and multistage models. *Progress in Biophysics and Molecular Biology* **2017**, 124, 41-48.

Josh Hiller; **Celeste Vallejo**; Leo Betthausen; James Keesling. Cancer incidence and the biology of extreme old age. *Integrative Molecular Medicine* **2016**, 4(1).

Vallejo, Celeste and James Keesling, *Epidemiology of MdSGHV in Musca domestica*, <http://www.siam.org/students/siuro/vol7/S01237.pdf> (9 July 2014).

Vallejo, C.R.; Lee, J.A.; Keesling, J.E.; Geden, C.J.; Lietze, V.-U.; Boucias, D.G. A Mathematic Model That Describes Modes of MdSGHV Transmission within House Fly Populations. *Insects* **2013**, 4(4), 683-692.

Lietze, V.-U.; Keesling, J. E.; Lee, J.A.; **Vallejo, C.R.**; Geden, C.J.; Boucias, D.G. Muscavirus (MdSGHV) disease dynamics in house fly populations - how is this virus transmitted and has it potential as a biological control agent?. *J. Invertebr. Pathol.* **2013**, 112, S40-S43.

**MANUSCRIPTS
IN
PREPARATION**

Celeste Vallejo; James Keesling. Using Little's Law in Stochastic Modeling. *Manuscript in preparation.*

PRESENTATIONS

Infectious Disease Institute, The Ohio State University (February 2019)

The impact of small and unvaccinated subpopulations on polio elimination (invited talk)

Mathematical Biosciences Institute, The Ohio State University (January 2019)

Evaluating the probability of silent circulation of polio in small populations using the silent circulation statistic (invited talk)

Derek Cummings' Lab Meeting, University of Florida (October 2018)

Examining the probability of silent circulation of polio using the endemic potential statistic (invited talk)

Biomathematics Seminar, University of Florida (October 2018)

Examining the probability of silent circulation of polio using the endemic potential statistic (invited talk)

Center for Inference and Dynamics of Infectious Diseases Trainee Call, University of Florida (online call) (March 2018)

Using Little's Law in Stochastic Modeling (invited talk)

Graduate Mathematics Association, University of Florida (November 2017)

"All models are bad but some are useful" (invited talk)

CSQUID/CIDID Working Group, University of Florida (November 2017)

Silent Circulation of Poliovirus in Small Populations (invited talk)

MIDAS group meeting, University of Michigan (October 2017)

Individual-Based Modeling of Silent Circulation of Poliovirus (invited talk)

Biomathematics Seminar, University of Florida (October 2017)

Silent Circulation of Poliovirus in Small Populations (talk)

Fall Southeastern Sectional Meeting, University of Central Florida (September 2017)

Analyzing a Stochastic Model of Cholera Using Little's Law (talk)

MIDAS Network Meeting, Atlanta, GA (May 2017)

Silent Circulation of Poliovirus in Small Populations (poster)

2017 Emerging Pathogens Institute Research Day, Gainesville, FL (February 2017)

Silent Circulation of Poliovirus in Small Populations (poster)

Biomathematics Seminar, University of Florida (February 2017)

Silent Circulation of Poliovirus in Small Populations (talk)

Joint Mathematics Meeting 2017, Atlanta, GA (January 2017)

Using Little's Law in Stochastic Modeling (talk)

Biomathematics Seminar, University of Florida (September 2016)

On the Absorption Probabilities and Absorption Times of Finite Homogeneous Birth-Death Processes (talk)

Association for Women in Mathematics Workshop at SIAM 2016, Boston, MA (July 2016)

Little's Law Applied to a Stochastic Model of Poliomyelitis (poster)

Biomathematics Seminar, University of Florida (January 2016)

Using Little's Law in Stochastic Modeling (talk)

Graduate Mathematics Association, University of Florida (December 2015)

Little's Law Applied to a Stochastic Model of Poliomyelitis (invited talk)

Queuing Seminar, University of Florida (September 2015)

Karl Sigman's Proof of Little's Law (talk)

Society for Mathematical Biology 2015 Annual Meeting and Conference, Georgia State University (June 2015)

Stochastic Models for the Silent Circulation of Polio (poster)

Emory University STEM Research and Career Symposium, Emory University (April 2013)

Epidemiology of MdSGHV (poster)

University of Florida's Undergraduate Research Symposium, University of Florida (March 2013)

Epidemiology of MdSGHV (poster)

Florida Undergraduate Research Conference, University of Florida (February 2013)

Epidemiology of MdSGHV (poster)

**WORKSHOPS
ATTENDED**

**American Mathematical Society's Mathematics Research Communities:
Agent-based Modeling in Biological and Social Systems**,

West Greenwich, RI (June 2018)

Spring School Series 2018: Models and Data,

University of South Carolina, Columbia (February 2018)

Uncertainty Quantification for Biological Models Tutorial,

NIMBioS at the University of Tennessee, Knoxville (June 2017)

**TECHNICAL
SKILLS**

C++, Python, Wolfram *Mathematica*, MATLAB, R, LaTeX

**TEACHING
EXPERIENCE**

Department of Mathematics, University of Florida

Discussion Leader, Analytic Geometry and Calculus I (Fall 2016)

Discussion Leader, Analytic Geometry and Calculus I (Spring 2016)

Discussion Leader, Analytic Geometry and Calculus I (Fall 2015)

**FELLOWSHIPS
AND GRANTS**

Fall 2017 Graduate Travel Award (2017)

SEARCDE 2016 Travel Grant (2016)

Association for Women in Mathematics Travel Grant (2016)

Center for Applied Mathematics Travel Support (UF) (2016)

Landahl Travel Grant (Society for Mathematical Biology) (2015)

College of Liberal Arts and Sciences Graduate Student Travel Grant (UF) (2015 & 2016)

The Bridge to Doctorate Fellowship (2013-2015)

University Scholars Program (University of Florida research grant) (2012-2013)

**PROFESSIONAL
AFFILIATIONS**

Infectious Disease Institute (The Ohio State University)

Center for Inference & Dynamics of Infectious Diseases

VectorBiTE